

CHANGES AND TRENDS IN THE DEVELOPMENT OF THE WORLD ECONOMY

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Abstract. Global challenges such as climate change, population growth, the spread of disease, global food security, the supply of fossil fuels and raw materials require sustainable solutions, which can only be facilitated through research, new technologies and the dissemination of innovations. Therefore, some countries have substantiated and implemented sustainable development strategies, which can become models for all governments in the world. In this paper, we exemplify some strategies that have had a positive impact on economic and social development, but also on environmental protection. Recognition of sustainable development as a model for solving threats to the future of mankind has relatively easily passed the stage of theoretical debates, becoming the premise on which global and national policies are based. Although ideologically the lines of argumentation continue to be animated, the transformations in the direction of sustainable development are in full swing and are becoming more and more clearly highlighted in all areas of socio-economic life.

Keywords: climate change, population growth, development economy

JEL CLASSIFICATION: Q54, Q56, F63

INTRODUCTION

The progress made in the twentieth century was far-reaching, with economically efficient results, but also had the most complex and unsuspected effects on society and the environment. Business has developed in all areas, which has led to a considerable growth of the world economy [Brat et al., 2011].

Looking ahead, global economic growth will be moderate. After the financial crisis of 2008, the recovery has been difficult, especially due to the geopolitical conflicts, which have multiplied lately. Most national economies recorded insignificant GDP growth (visibly lower than before the crisis). In developed economies, significant deceleration risks persist, especially in the European Union and Japan.

Developing economies have seen moderate growth, but there has also been a rapid slowdown in some emerging economies such as Latin America and the Commonwealth of Independent States (CIS).

In 2016, it is estimated that Gross World Product (WPP) will increase by 3.3%, even if employment growth is slow. [United Nations, 2015] The unemployment rate has been relatively stagnant since 2013, but there are also high levels of unemployment, especially in North Africa, West Asia, and some of the economies in Southeast Europe.

Global inflation is relatively limited. There are many developed countries but also with economies in transition that have high inflation. Many developed countries in Europe also face the risk of deflation. For the foreseeable future, global average inflation is expected to stagnate at around 3%.

Regarding the prices of primary raw materials, in the period 2012-2014, there was a decreasing trend. For example, the international price of oil fell sharply in the second half of 2014, a level that is still maintained today. Non-oil commodity prices have also fallen, although they are still high compared to recent decades.

World trade has also grown slowly in recent years. In 2014 it registered an increase of 3.4%, still well below the pre-crisis trends. In the period 2015-2016, a further increase in production and trade in goods and services is expected, although there are high risks caused by the intensification of geopolitical tensions that may have negative effects on trade flows.

In order to identify economic and social problems at global level, we consider it necessary to analyze the European Union (EU).

The EU is a global economic player, with more than 500 million people generating a quarter of the world's Gross World Product (GWP). The EU is also a historical and cultural player, as its states are closely linked to other parts of the world, so that European policy pursues a world order rooted in effective multilateralism based on the proper functioning of international institutions.

The EU is the world's largest donor of development assistance and strives to improve international development cooperation. It is active in over 160 countries, areas and organizations around the world, with the aim of fighting poverty and consolidating democracy. The EU also has a global leadership in environmental policy. The "Climate" package adopted at the end of 2008 was designed to give a new impetus to the "global industrial revolution".

The EU is well represented in multilateral economic fora and international financial institutions, with a view to playing an increasing role in managing the integration of the global economic order. All economic activities must be integrated into a framework of stability-oriented macroeconomic policy objectives in order to avoid crises [Cohen & Dalton, 2015].

Sustainable development strategies

Global challenges such as climate change, population growth, the spread of disease, global food security, the supply of fossil fuels and raw materials require sustainable solutions, which can only be facilitated through research, new technologies and the dissemination of innovations. Therefore, some countries have substantiated and implemented sustainable development strategies, which can become models for all governments in the world. Next, we exemplify three strategies that have had a positive impact on economic and social development, but also on environmental protection. These are the sustainable development strategies adopted in Germany, Finland and China.

Sustainable development strategies in Germany

Germany is experienced in the development and introduction of environmental standards and is also a world leader in the development of environmental technologies. Germany already has strong and strategic environmental partnerships with many developing countries, which are still in the process of expanding.

Germany has considerable potential in science and business, a potential that is activated in order to identify solutions to global challenges. Research funding has become a way for Germany to emerge from the economic and financial crisis of 2008. Thus, in 2008-2009, research spending was not reduced. On the contrary, they have risen to about 3% of GDP. As a result, the government has supplemented funding for education and research by 12 billion euros.

The federal government has set up a number of major sustainability research initiatives. Moreover, it supports specific research topics in various fields such as: i. *Hightech 2020 strategy*; ii. *the framework program "Research for sustainable development"*; iii. *master plan for environmental technologies* and iv. *energy research program*.

i. *Hightech 2020 Strategy*

The aim of this strategy is to create markets that intensify cooperation between science and industry and continue to improve the basic conditions for innovation. Germany wants to become a pioneer in finding technical and scientific solutions in the field of climate / energy, health / nutrition, mobility, security and communication.

Examples of priority topics:

- energy efficient cities and reduction of carbon dioxide emissions;
- intelligent transformation of energy supply;
- renewable resources as an alternative to oil;
- one million electric vehicles in Germany by 2020;
- effective protection of communication networks;
- more low-power Internet users.

This strategy will give a new impetus to sustainable growth and employment in Germany.

ii. *Sustainable Development Research Framework Program*

This program funds, with funds totaling over € 2 billion, the development of sustainable innovations by 2015. Thus, innovative technologies and concepts are funded to address global challenges such as climate change, resource conservation, energy needs and biodiversity conservation.

The new research framework program focuses on and acts on the following key areas:

- global responsibility - international networks
- Earth as a system and geotechnologies
- climate and energy
- sustainable savings and resources
- social development and cross-cutting issues of sustainable land management and the economy.

iii. *Master Plan for Environmental Technologies*

The Master Plan for Environmental Technologies was jointly developed by the Ministry of Education and Research and the Ministry of Environment and was adopted by the Federal Cabinet. The aim of the plan is to facilitate the access of German companies to become leaders on the environmental technology market and to improve the conditions for the development and use of new environmental technologies. The plan focuses on climate protection, resource conservation and hydrotechnical works. It is estimated that the impact of the funding allocated under this master plan will be to increase turnover in the environmental industry, which could reach around € 32 trillion by 2020.

The plan combines concentrated funding activities with measures related to standardization, education and training and networking at European level.

iv. *Energy research program*

The energy research program is entitled "Research for an environmentally friendly, reliable and affordable energy supply". This program is an important step towards the implementation of the Energy Plan approved on September 28, 2010, which the federal government wants to use to enter the renewable energy era.

The program focuses on the following: renewable energies; Energetic efficiency; smart energy storage technologies and network technology; integration of renewable energies; the interaction

between these energy technologies [National Sustainable Development Strategy, Progress Report, 2012 pp. 200-240].

Sustainable development strategies in Finland

In Finland, national challenges for sustainable development include high resource consumption, carbon dioxide emissions, the fact that half of natural habitats are endangered, the gap between sustainability and value creation, and the protection of the state's well-being.

The Community of Finland implements strategies whose main objectives are sustainable development from the perspective of human well-being and the environment, a healthy and sustainable economy and the promotion of a sustainable lifestyle.

One of these strategies is "Finland we want in 2050 - Society's commitment to sustainable development". Its objectives are:

i. Equal perspectives for the well-being of the population

All members of society will have equal prospects for health, education and employment. Particular attention will be paid to the well-being of children and young people.

ii. A participatory society for citizens

Promoting equal opportunities for all people in order to influence their lives and common problems. This goal will be achieved by supporting young people; a more transparent administration; promoting cultural diversity and tolerance.

iii. Sustainable jobs

Measures to achieve a more sustainable economy include job creation and increasing productivity and quality of work. Sustainable development will be integrated into all education and lifelong learning activities.

iv. A zero carbon company

The measures to be taken to achieve this goal are to improve energy efficiency and make more efficient use of renewable energy sources. Thus, investments will be directed in the development of energy technologies and innovative businesses.

v. Consumption according to the bearing capacity of nature

The objective will be achieved by reducing the consumption of natural resources at a sustainable and equitable level globally by increasing resource efficiency and promoting the recycling of materials from non-renewable resources and the circular economy.

vi. Sustainable local communities

Sustainable communities with jobs, housing, full services, sustainable transportation systems and green areas will be created. Local business decision-making models will also be developed so that citizens can create a pleasant and healthy living environment for themselves.

vii. A rational economy of resource use

Finland will promote and provide sustainable and competitive solutions, both nationally and globally. Rational use of resources will provide a competitive advantage for companies and communities and a basis for environmental business. Finland will provide the best test markets and operating environments in the world for eco-innovation and sustainable growth.

viii. Decision-making process that respects nature

The economic orientation that promotes biodiversity and the sustainable use of natural resources will be strengthened. Social incentives that are harmful to the environment will be eliminated or redirected.

In September 2013, the Finnish government adopted a Resolution on the reform of state research institutes and research funding, invigorating research and collaboration between academia and business [Finland's National Innovation Strategy, 2013]

SUSTAINABLE DEVELOPMENT STRATEGIES IN CHINA

Since 1978, when economic reforms began in China, the government has used a variety of policy instruments to promote innovation. These have led to economic development based on industrial production and high value-added exports, while attracting a large share of foreign direct investment. Thus, in the last three decades, China has experienced significant economic growth, which has been based on labor, investment and the growth of high-tech industries.

China is currently going through a period of transition in which the issue of identifying new sources for further economic growth is raised. A recent report suggests that in order to continue the upward trend, China needs to generate two to three percentage points of annual GDP growth through innovation [Roth, Seong and Woetzel, 2015].

China is a "sponge of innovation", absorbing and adapting existing technology and knowledge from around the world, a process that makes the country a global leader in innovation. Thus, China has become a strong innovator in areas such as consumer electronics and construction equipment. This was due to the allocation, each year, of over \$ 200 billion for research (the second country after the US), producing almost 30,000 doctors of science and engineering and leading positioning according to patent applications (more than 820,000 in 2013).

In order to continue to grow, China must seize new opportunities for innovation in order to transform the production sector through digitalisation and the service sector through an Internet connection.

To develop a clearer picture of this potential, four directions of innovation have been identified: customer-oriented, efficiency-oriented, engineering-based, and science-based.

At the same time, China is facing serious pollution problems. Of these, an unprecedented aggravation was recorded for air pollution. Although considerable efforts have been made at government level to improve air quality, pollutant concentrations in almost every major urban area exceed the standards recommended by the World Health Organization (WHO). The impact is devastating on health spending (6.5% of China's GDP), but also on life expectancy, which has fallen by an average of 5.5 years. Health care costs, shorter lifespans, reduced labor productivity, damage to buildings, equipment, and agricultural land totaled an estimated \$ 535 billion in 2012 [China Statistical Yearbook, 2013].

In order to reduce pollution, the government applies anti-pollution measures similar to those of other industrialized economies:

- Subsidizing or mandating the use of greener fuels, such as natural gas, nuclear energy and renewable energy;
- Mandatory pollution control equipment on major point sources and vehicles;
- Request for scrapping of old, high-emission vehicles and heating installations per unit of energy produced.

Air quality in the urban environment to reach a level of safety requires the implementation of these policies more aggressively. To correlate the requirements of economic growth and environmental protection, three strategies have been identified: i. Substituting coal with natural gas or propane for residential and commercial use; ii. replacement of coal in electricity production; iii. decommissioning of old vehicles [Chase et al., 2015].

- i. *Replacement of coal with natural gas or propane for residential and commercial use*

In order to meet air quality standards, residential and commercial users must avoid burning coal, biomass and plastic waste in urban areas. To replace the 114 million tons of coal burned by households and commercial users, China needs 88 billion cubic meters of natural gas, a 60% increase in consumption, which in 2012 was 147 billion cubic meters.

ii. *Coal replacement in electricity production*

Half of the coal burned in China generates about 79% of electricity production. In the USA, but especially in European countries, the contribution of coal to electricity production is much lower, being below 40%. To achieve such a goal, China's electricity production would decrease by 1918 billion kWh, with a significant impact on industrial production and urban consumption. A first step in implementing this strategy is to restrict the activity of highly polluting coal-fired power plants near cities. The environmental impact of this measure is estimated to be a 25% reduction in particulate matter and sulfur dioxide emissions at national level, which will significantly improve air quality in urban areas.

To compensate for the reduction in production caused by the closure of coal-fired power plants, it is necessary to increase the production capacity of hydropower plants, wind farms and nuclear power plants. For each category, quantitative targets have been set to be met by 2020. In calculating them, the electricity demand corresponding to the level of production in 2012 has been taken into account. Taking into account that in 2013 and 2014, the increase in electricity demand was moderate, these estimates have a high degree of relevance.

For hydropower plants, an increase in production capacity is expected from 249 GW to 325 GW. In the case of wind farms, which currently generate 0.996 billion kWh, or 20% of electricity production, the production capacity must reach 540 GW. The additional production capacity of nuclear power plants must be 84 GW, which means an increase of 45%, ie 58 GW additional capacity by 2020.

iii. *Decommissioning of old vehicles*

Most vehicles sold in China are manufactured by joint-stock companies (between international car companies and Chinese companies), giving Chinese manufacturers access to pollution control technologies.

Disposal of 14.5 million old vehicles equipped with inadequate pollution control equipment has been considered the most effective way to reduce air pollution caused by emissions from road transport. The application of this strategy led in 2009 to reduce emissions by: 70% for carbon monoxide, 70% for volatile hydrocarbons; 61% for nitrogen oxides and 76% for suspended particles.

The costs of these measures have been estimated at \$ 215 billion annually, but much lower than the costs of air pollution, which amounts to more than \$ 535 billion annually. Therefore, it can be said that investments in reducing air pollution are profitable both economically, but also socially and environmentally.

CONCLUSIONS

After decades of trade-offs between economic growth and the costs to the health of its citizens and the environment, these pollution abatement measures have generated political pressure that has led to increased efforts to reduce damage.

The sustainable development strategies adopted by Germany, Finland and China demonstrate, on the one hand, the importance given at government level to solving environmental problems and, on the other hand, the decisive place and role of innovation for the success of sustainable development. economic, social and environmental. In these states, the objectives of sustainable development have been assumed at the strategic level, their significance being highlighted by the development and

implementation of specialized programs. The expected results of sustainable development strategies are expected to materialize through the integration of innovation, especially in the energy industry.

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