

Macroeconomics

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**CIRCULAR ECONOMY
AS A GLOBAL IMPERATIVE**

Abstract

The idea of the circular economy is conceptualized as the basic transformative, integrative philosophy, which is the basis of ecological and economic policy of public-private partnership. It is found that the intensification of competition for resources leads to increased waste production and pollution, which led to the formation of an economic system. Its components are renewable energy sources, increased production of waste from production waste, minimization of food waste and improving the quality of life of all segments of society. All successful micro-industries have been found to be the product of successful business start-ups. The author identified the key factors of the circular economy: the potential of the Fourth Industrial Revolution; circular value chains based on recycled waste; leaders in the circular economy; cooperation. The analysis of the circular business model made it possible to prove that it can include one or a set of the following elements: circular design, optimal use, value recovery, network (chain) organization. Those ones represent the circular economy as a global imperative of the formation and development of its architecture.

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JEL: F18, F44, F64, F68.

Setting objectives

Natural resources of the earth (water, land, minerals, etc.) are essential for human survival, prosperity and well-being. But very soon the world's urbanized population is projected by many international organizations to face shocking challenges:

- annual production of exhaustive resources will reach 183 billion tons by 2050;
- demand for food and fiber will increase by 60% and 80-95% respectively by 2050;
- global demand for water will be 50% higher than currently available resources and will only meet their reliable supply by 2030.

Current trends of intensive, inefficient and unsustainable use of the Earth's exhaustive resources will affect their accessibility, environmental friendliness, and future destruction, thereby threatening the systems that provide the basis for sustainable development.

Analysis of recent research and publications

The hidden cyclicity in everything is the obvious scientific basis of our reality. In physics, this is called «Saving the Circle». Conservation of the circle is visible as a constant set of opposite pairs and, as the main dynamic in nature, participates in everything. The theory explains how circular dynamics in science,

philosophy, religion, psychology, history, economics and politics take place. As will be confirmed by major physicists, Circular Theory will transform the thinking of mankind by integrating the hard sciences with the social sciences, clarifying the dynamics in finance and politics, solving the problems raised by different religions, creating robust prosperity, peace and productivity for all. Yardley collaborated with Nobel laureate Brian Josephson on the Uniform of Material Matter at Cambridge University to present Circular Theory as a fundamental basis for theoretical physics. The theory integrates the thinking of Einstein, Jung, Plato, Aristotle, Hegel, Galileo, Columbus, Noter and Newton. Circular theory is the transformative, integrative philosophy to which we have all sought.

National scientists V. Anischenko and V. Margosov in their work «Epistemological and ontological principles of reflection of the ecological component of society's development in economic theories of reproduction» [11] draw attention to the special approach to the study of ecological and economic problems, which was proposed within the framework of neo-institutional economic theory. R. Coase's theorem, developed in the framework of this theory, is an alternative to A. Pigou's approach and proves that a compromise can be reached through market negotiations between the producer and the recipient of externalities, regardless of the distribution of rights to natural resources (for example, negotiations between the customer of a certain industrial object and population of the respective territory). It should be noted that R. Coase's provisions underlie the ecological and economic policy of public-private partnership, which became widespread in the late twentieth – early twentieth centuries.

The issues of the interconnection of the ecology and economics have been widely covered and evaluated in the writings of scholars of the Roman Club. One of the first works by members of this club (D. H. Meadows, D. L. Meadows, J. Randors, and W. Berens,) («Growth Limits» (1972) substantiates the need to change the growth trend and achieve a long-term economic outlook. In another report by the Club of Rome, «Humanity at the Crossroads» (1974), M. Mesarovich and E. Pestel argue that it is advisable to create global systems of resource allocation across countries and to build a new economic order, and emphasize the importance of socio-economic and political constraints All of this gives rise to the possibility of isolating the circular economy as one of the most important imperatives for the modern globalization of the entire world space.

Problem statement

The main purpose of this work is to highlight the trends in the formation and positioning of the circular economy as a global imperative.

The main material

With increasing competition for resources and growing waste and pollution, there is a growing need to move towards a comprehensive circular economic system. The circular economy has the incentives and instruments to use the resources available in an efficient and sustainable way – relying on renewable energy sources, getting more value from production waste, minimizing food waste and improving the quality of life for all sectors of society.

Perhaps the most important is the fact that this transition creates enormous opportunities. Although combined with rapid technological change and increasing globalization, some existing jobs, economic sectors and manufacturing processes will become obsolete, but it will also create ground for new green jobs and the development of new industries. And now we can already see that, because the rapidly growing sharing economy is one example how we can not only use resources efficiently but also make them increasingly accessible.

Globalization over the last 30 years has produced many significant results for the whole world. This has allowed countries such as China, India and many others to prove themselves economically, moreover globalization has led to an increase in supply chains. They consume additional energy for transportation, the main part of which used the fossil fuels. Thus, longer supply chains mean the need to increase inventory, resulting in damage, waste and storage infrastructure that consumes additional energy.

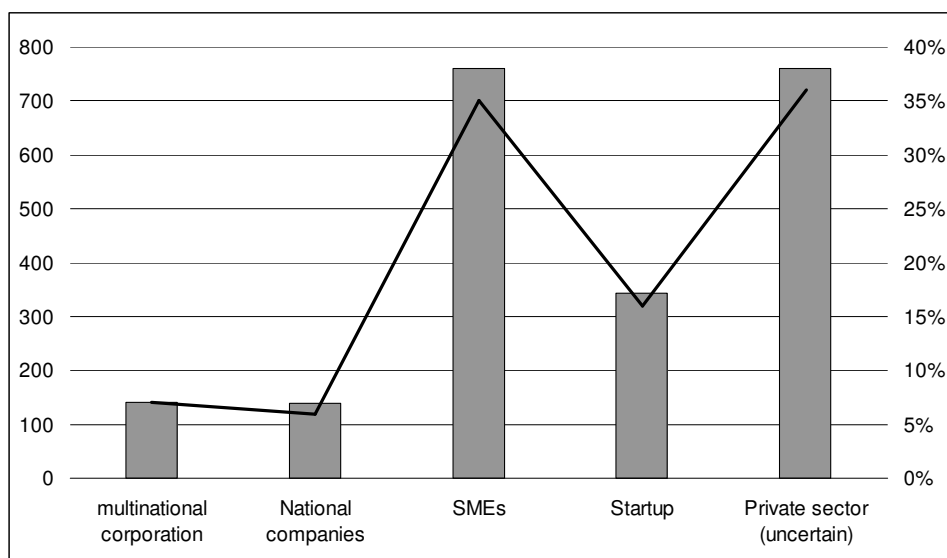
With a careless approach, moving to a circular economy will increase transportation waste in reverse logistics caused by the need for a circular economy to return products for maintenance, reuse or recycling to move through the network, avoiding their accumulation at landfills.

At the same time, technology changes are making the transition to the micro industry. In this way, processing technologies are becoming more convenient, flexible and less costly. Almost all successful micro-industries, brewing and baking and the sewing of used fabric are successful business startups. These micro-level business approaches that reduce the impact on our planet (Fig. 1).

Thus, minimized transportation, reverse logistics for maintenance and recycling for reuse are those key vectors that position the circular economy as a global imperative. Reuse can be simplified by the presence of the necessary resources of a particular industry on the ground, allowing for easy redistribution.

European countries adopt and integrate strategies for collecting and reusing already used resources, thus reducing the need for new materials to be produced.

Fig. 1

Type of organizations (number and %)

Source: according to the Circular economy club.

The movement to a circular economy is a completely logical approach to solving global problems. However, a rational way is not always the way of least resistance. Economy nowadays prefers single use and linear throughput, changing the system will require leadership, collaboration, innovation and commitment to break the status quo.

It was in these key aspects that the discussion of the circular economy was focused during the annual 2019 meeting in Davos, with four main priorities for the coming year highlighted.

1) distinguishing leaders in the circular economy;

For the fifth year, the Circularity Award honored leaders and champions of the circular economy among big business, governments, investors, and innovators. The European Commission, Triciclos and Winnov have become the best representatives in this field at mega, macro and micro levels respectively.

These leaders and entrepreneurs have used the imperfections and inefficiencies in today's economic systems to reap the benefits and to show them

around the world. The need energy and courage to upset the status quo and in the end to implement the boldest ideas.

The platform for accelerating the circular economy, which now gathers more than 50 leaders, ministers and experts, will continue to do just that, while challenging leaders to involve more of their colleagues in shaping practical actions, commitments and collaborations.

2) the potential of the Fourth Industrial Revolution;

During the annual Davos meeting on «Globalization 4.0: Shaping Global Architecture in the Age of the Fourth Industrial Revolution», one of the key topics was how the Fourth Industrial Revolution can bring the positive transformation in the circular economy.

The Davos White Paper focuses on the potential of technology and innovation in the value chain, namely in electronics and plastics – from the formation of origin tools, to passports for goods and the Internet of things.

Google and SAP have also launched the Circular Economy 2030 competition to engage innovators in circular development, and the World Economic Forum and its partners are developing a 360 Scale program to partner with countries to support entrepreneurs to expand their circular solutions.

And while the potential remains largely untapped, the speed with which such technologies have entered other fields inspires hope.

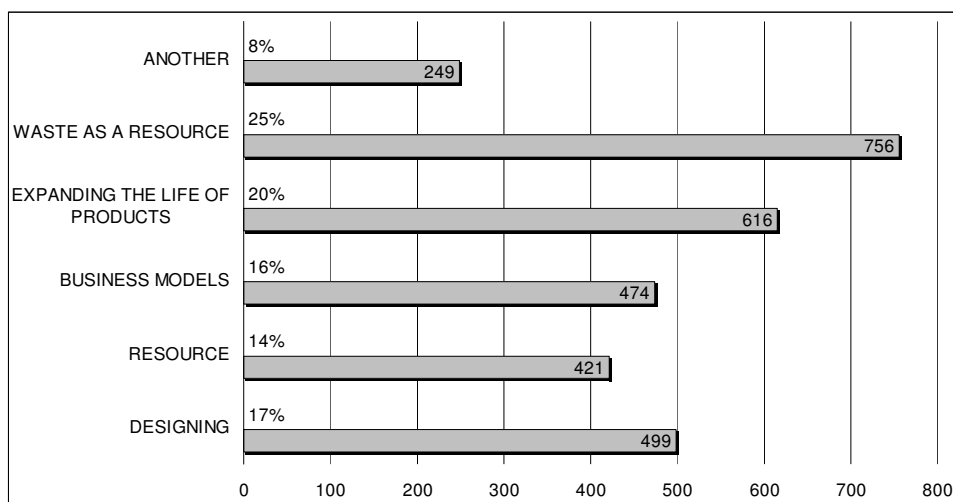
3) циркулярні ланцюги створення доданої вартості на основі вторсировини.

Plastic, electronics, food and fashion are all involved in raw material based circuits. 2019 is the year when a positive impulse turns into a commitment to shaping the circular plastic economy into tangible investment and worldwide action (Figure 2).

In addition, Davos considered collaborating between the Nigerian Government, the Global Environment Facility (GEF), the United Nations Environment, Dell, HP, Microsoft and Philips to contribute \$ 15 million to the development of an electronic waste treatment network in Nigeria. The ambition is to expand these collaborative efforts in other global markets, and to work with business to rethink business models and product design to take full advantage of unused circular potential.

The transformation of the food system is another area that has led to a positive acceleration – the report in Davos on food with a potential of \$2.7 trillion benefits annually for the society and the environment.

Fig. 2

Types of circular economy strategies (number and %)

Source: according to Circular economy club.

Mega important aspect is a Circular Fashion. The Fashion for Good initiative, circular textile initiatives, are shaping more sustainable solutions, but only recently have governments begun to take a bolder stance on what has become an extremely wasteful and polluting sector.

For example, France passed a law that banned the practice of burning unsold clothing. In 2019, governments stepped up to continue scaling up leadership, particularly during the French presidency of the G7 (Figure 3).

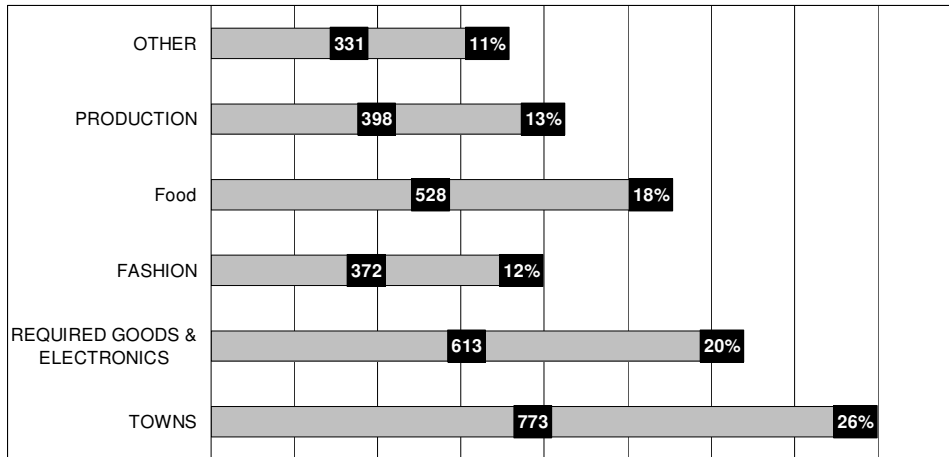
4) cooperation;

Although momentum and positive progress are more or less clear, this decision still has a long way to go. The Circular Gap report reminds that only 9% of resources invested in the economy are reusable. This percentage remains unchanged from the previous year.

For example, PACE is expanding its efforts in 2019 in collaboration with the World Resources Institute and other partners, scaling leadership, leveraging innovation potential, and starting to shift global material resource flows from linear models as it progresses into 2020 (Figure 4).

Fig. 3

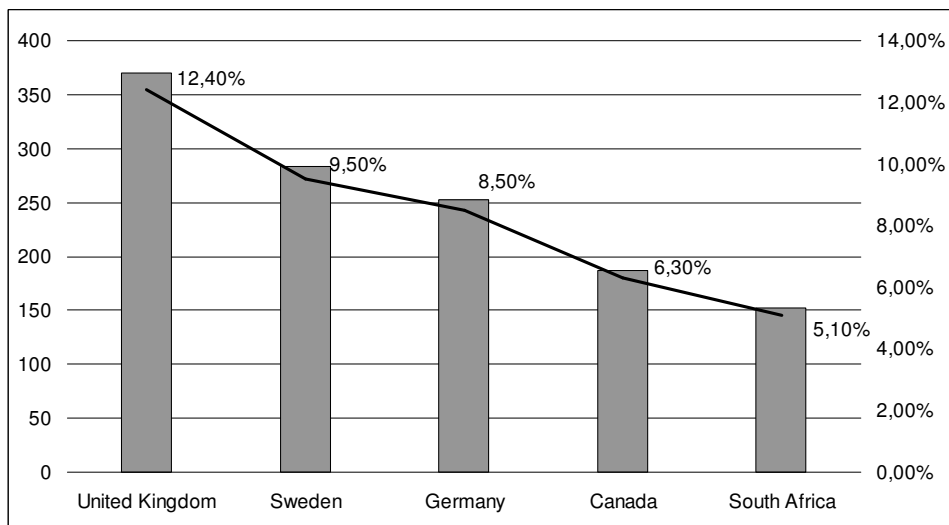
Initiatives sectors (number and %)



Source: according to the Circular economy club

Fig. 4

Circular Initiatives by Region and Top 5 Initiatives by Region



Source: according to Circular economy club.

The circular economy has truly captured the world of both national and corporate programs, high-level conferences and business networks. The circular economy is all about recycling, waste prevention and resource efficiency. The circular economy is everything and much more. It is as diverse as the people working on its implementation and the industries it covers.

Therefore, it should be concluded that the circular business model focuses on any one or more of the following categories:

- circular design: development of products and materials for the long-term preservation of value;
- optimal use: support for long-term use and product performance;
- cost recovery: support for the cost of the product even after its expiration;
- network organization: organization and coordination of a community that provides circular business models.

This opportunity begins with a small change. Power is to change your mindset to rethink your business as part of a circular economy instead of a linear one.

Conclusions

Circular economics is an effective alternative resource to linear economics, and nature itself is an exemplary example of circular economy principles in action. Interrelated cycles of use and waste are complementary and continually supportive of life. Waste is a concept of natural cycles. The human exploitation of natural resources over the last two hundred years of rapid industrialization has meant that the Earth's natural cycles have become more and more balanced. Waste in all its dimensions has become a defining feature of the current linear model.

The fourth industrial revolution, characterized by increasing digital connectivity between people, products and systems driven by the Internet and mobile technologies, has become a direct catalyst for unlocking a range of opportunities that contribute to social, economic and environmental benefits.

The Ellen MacArthur Fund Report on the Investment Opportunities of the Circular Economy estimates that \$ 600 billion can be saved in Europe by 2030 on primary resources. This new paradigm also has a positive impact on the cost of the product and jobs.

Circular economics, as a global imperative, is gaining more and more attention as consumers and manufacturers are aware that the current linear take-away model will lead to possible depletion of resources, excessive waste, and environmental degradation.

The concept of circular economy originated in the 1960s and is based on the idea of a cycle that is modeled on the natural cycle that has been in existence for millennia. In the circularity model, resources are used in a closed loop system, minimizing output, waste, and emissions.

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