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Circular Economy and Banking Industry in the Digital Age: Case Study of Erste Bank a.d. Novi Sad

Cirkularna ekonomija i bankarska industrija u digitalnom dobu: studija slučaja Erste banke a.d. Novi Sad

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Abstract: Circular economy, as a concept that requires a multidisciplinary, holistic approach, as well as involvement of many different stakeholders, is becoming the subject of interest not only in the wide academic community, but also practitioners. One of the factors that greatly contributed to the development of the circular economy is modern digital technologies and their massive application. The aim of this paper is to point out the role and importance of the commercial banks in the application of circular economy in the digital age. Among various stakeholders in the Republic of Serbia, commercial banks, as the most important segment of the financial sector, should be specially emphasized. Banks have already included the aspect of energy efficiency, environmental protection, and other areas that speed up the development of the circular economy in their credit risk policies. On the one hand, commercial banks need to provide sufficient funding to circular businesses, while on the other hand they need to make internal transition from a linear toward circular economy. The key conclusion is that engagement of commercial banks in the circular economy in the digital age contributes to the socially responsible behavior, as well as to the greater profitability and competitiveness.

Keywords: digital age, digital technologies, circular economy, social responsibility, banking industry.

Sažetak: Cirkularna ekonomija, kao koncept koji zahteva multidisciplinarni, holistički pristup i uključenost većeg broja različitih stejkholdera, postaje predmet interesovanja ne samo šire akademske zajednice, već i praktičara. Jedan od faktora koji je u velikoj meri doprineo razvoju cirkularne ekonomije su savremene digitalne tehnologije i njihova sve masovnija primena. U ovom radu je ukazano na ulogu i značaj banaka u primeni koncepta cirkularne ekonomije u digitalnom dobu. Među različitim stejkholderima u Republici Srbiji, treba istaći komercijalne banke jer one predstavljaju najvažniji segment finansijskog tržišta. Banke su u svoje kreditne politike već uključile aspekt energetske efikasnosti, zaštite životne sredine i druge aktivnosti koje podstiču razvoj cirkularne ekonomije. Sa jedne strane, komercijalne banke treba da obezbede dovoljne izvore finansiranja za cirkularno poslovanje, dok sa druge strane interno moraju da naprave zaokret od linearne ka cirkularnoj ekonomiji. Ključni zaključak rada je da uključenost komercijalnih banaka u oblast cirkularne ekonomije u digitalnom dobu značajno doprinosi društveno odgovornom poslovanju, kao i rastućoj profitabilnosti i konkurentnosti.

Ključne reči: digitalno doba, digitalne tehnologije, cirkularna ekonomija, društvena odgovornost, bankarska industrija.

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INTRODUCTION

The circular economy is the fourth industrial revolution platform for application of a new manner of organizing the industry where different stakeholders have an important role. It represents a new approach to a sustainable development and economy, which arose in the 1970s as a response to the global environmental crisis. The concept of circular economy is accepted in the most developed economies in the world, as well as in some of the largest corporations, due to the final effects which are economical (reduction of costs, higher efficiency) and environmental (reduction of the negative impact on the environment) (Vukadinović, 2018). Circular economy means elaboration about novel paradigm which contributes to the society welfare and social equality.

Circular economy is usually observed as the economy in which the value of products, materials and resources is maintained (if possible) while the generation of waste is minimized. This approach is quite different from the previous, widespread concept of linear economy. The crucial difference between circular and linear economy exists in the way how value is created and/or preserved. A linear economy is based on the "Take-Make-Dispose" approach which means the following: people collect raw materials, and then use them for creating products, while products are thrown away as a waste after usage (Radhi & Ibraheem, 2021). On the other hand, in the circular economy the focus is on value creation by its maintenance. Usage of natural resources and energy is reduced to a minimum, leading to reduction in generating of waste, pollution, and other negative impacts on the environment. The circular economy prevents damage to the environment and reduces pollution by ensuring the production process through clean technologies using the motto "Make-Use-Recycle". Circular economy requires active involvement and participation of various stakeholders – not only government, organizations, companies, employees, but also suppliers, citizens, non-governmental organizations, and intergovernmental organizations (Ozili & Opene, 2022). Furthermore, there is a growing need for active participation of the academic community and entire educational system. By introducing various ecological contents at all levels of education, people will have the opportunity to acquire knowledge and skills needed for protection and improvement of the environment. Furthermore, they will acquire necessary knowledge regarding main ecological issues of contemporary society (Vujičić et al., 2022).

The role of the banks in the development and fostering of a circular economy can be observed from different perspectives. Firstly, banks need to develop a common understanding of the circular economy in order to be able to identify, select and finance those types of projects. Secondly, banks need to develop a common set of guidelines for financing project from circular economy area. Thirdly, banks need to adjust their existing financial model with new models required in a circular economy environment. Fourthly, they need to provide and offer direct loans for circular economy projects not only for large, but also for small companies, start-ups and young entrepreneurs. Fifthly, banks need to become green, with competent and well-trained employees, with a strong culture oriented toward circular economy (Ozili & Opene, 2022).

Digitalization is one of the enablers of the concept of circular economy (Antikainen et al., 2018). Implementation of various digital technologies enables a strategic redesign of products, business models, and value chains with reduced consumption of material and energy, as well as many new opportunities to reuse and recycle resources (Bressanelli et al., 2022). The Internet of Things (IoT), Big Data, Data Analytics are considered as digital technologies that are essential enablers of the circular economy (Kristoffersen et al., 2020). Those technologies are especially important in the process of decision making regarding the usage of natural resources due to data collection from various sources and numerous opportunities for their analysis. Furthermore, digital technologies will enable smart products and services that may stimulate the optimal use of resources and materials. Some authors pointed out that newer digital technologies such as artificial intelligence and blockchain bring many opportunities in the field of traceability and transparency of resources and products, as well as in value creation (Ingemarsdotter et al., 2020). Others stated that digitalization may have a positive impact reflected on more resource-efficient products, improved production – increased efficiency and reduced environmental impact, optimized sales and logistics, and optimized waste management and recycling with the aim to keep raw materials in the system as much as possible (Ramesohl et al., 2022). Automation, data analysis, data collection and integration as key digital functions may lead to creation of circular economy strategy which is based on useful application of materials, extending lifespan, and smart use of products (Liu et al., 2022). The key benefits that digitalization brings to the concept of circular economy is possibilities for: remanufacturing, ecosystem collaboration, valorisation, recycling, resource recovery, reverse logistics, and waste segregation (Chauhan et al., 2022). Circular economy is undoubtedly fostered and supported by the process

of digitalization due to many possibilities of predictive analytics, real-time tracking and monitoring, and data-driven decision making.

In the last couple of years, circular economy has become an important topic not only within academic circles, but also in practice. Circular economy is an optimal solution to the amount of generated waste and scarcity of resources (Lieder & Rashid, 2016). Its basic principle is repositioning to long-term and sustainable green growth, and green behaviours.

In Republic of Serbia exists a significant potential for development of circular economy. However, the development of circular economy requires system changes and innovations of technology, organization, society, financing, policies, regulations, as well as the new management concepts and techniques (Mitrović et al., 2022). Furthermore, Republic of Serbia need to provide adequate support for innovation and to create necessary conditions for investment with the help of the Government and entire business sector (Mashovic et al., 2022).

The aim of this paper is to investigate the role and importance of the circular economy and banking industry in the digital age with the case study of Erste Bank a.d. Novi Sad.

1. MATERIALS AND METHODS

For the purpose of this paper the case study was used, as one of the most frequently applied research methods. The aim of case study is to investigate and analyze a certain phenomenon regarding its specific social, cultural and economic context (Yin, 2009). The importance of the case study in the field of management and social sciences stems from its possibilities to investigate some unique, rare and atypical events and processes (Farquhar, 2012). The special value of case study lies in the fact that the researcher begins his investigation with a sincere interest in a certain phenomenon. Furthermore, the case study method implies the usage of multiple sources of data, both secondary and primary, thus providing a holistic approach and studying the phenomenon from multiple perspectives (Remenyi et al. 2003). In this paper, a case study was conducted on the example of Erste Bank a.d. Novi Sad which has a strong focus on digitalization and circular economy.

2. RESULTS AND DISCUSSION

Circular economy can be observed as a method of behaviour where waste materials and resources are minimized and where everything can be used multiple times with no negative impact on the environment (Sgroi, 2022). It refers to a regenerative system that achieves the reduction of the resources used, the decrease of the amount of waste and emissions, reduction of energy losses, etc. (Suárez-Eiroa et al., 2019).

2.1. The impact of the circular economy

The best way to understand and emphasize the impact of the circular economy is through the 10R model which is presented in Table 1. All principles described with words starting with letter R provide opportunities to: increase the product efficiency, reduce waste, protect, and save natural raw materials (Morganti P. & Morganti G., 2021).

Table 1 - Results of fixed and random effects model

R words	Explanation
Recovery	Recovering the energy of materials
Recycle	Processing materials with the aim to obtain the same material with equal or lower quality
Repurpose	Use discarded products or their parts in a new product with a different function
Remanufacture	Use parts of discarded products in a new product with the same function
Refurbish	Restore an old product and bring it up to date
Repair	Repairing and maintenance of defective products so they can be used with their original function
Reuse	Reuse by another consumer of discarded product which is still in a good condition and fulfills its original function
Reduce	Increase efficiency in product manufacture or use by consuming fewer resources and natural materials
Rethink	Make product more intensive through sharing or with multifunctional products
Refuse	Make a product redundant by abandoning its function or by offering the same function with a radically different product.

Source: adapted from Morganti & Morganti, 2021, p. 18; Sá et al., 2022, p. 2

The three key principles upon which the circular economy is based are: (1) economic activity should not produce waste and pollution; (2) products and their materials should be used as long as possible; and (3) natural and social systems should be regenerated (Investor Group on Climate Change, 2022).

It is important to emphasize that a circular economy is a valuable means for achieving sustainable development (Wiebe et al., 2022) through a more rational way of thinking, usage and allocation of all materials, resources, and components.

In the business world, circular economy represents a method of functioning of organizations in that way in which the waste produced in one organization can be a valuable input for another (Geissdoerfer et al., 2017). Resources go into production and consumption more than once, with the main aim to rationally use limited natural resources (Preka et al., 2022). Consequently, that will have positive effects on several goals identified by the United Nation 2030 Agenda for Sustainable Development, especially on responsible consumption and production (Amato, 2022). Many companies are turning their business logic toward a circular economy. Phillips is one of them. This electronics company has decided to generate 25% of its revenue from circular products, services, and solutions (Investor Group on Climate Change, 2022).

The circular economy represents a strategy that provides economic growth without increasing the consumption of resources and without negative impact on the environment (Ceretti, 2016). Furthermore, companies are becoming oriented to the triple bottom line in their businesses and functioning. The triple bottom line encompasses three important pillars which should be considered to build and maintain sustainable business. Those pillars are (Kenny et al., 2022):

1) **Economic** - strategic planning and business decisions are dominantly oriented toward maximizing profits and reducing costs.
2) **Social** - commitment to customers, employees and community members have become a valuable factor in decision making and business operations.
3) **Environmental** - businesses have become the leaders in protecting the environment by refocusing their operations to more green ones – green chain supply management, green marketing, green human resource management, etc.

The key message of the triple bottom line is that businesses should not measure and focus only on their economic impact, but also social and environmental (Miller, 2020). Socially responsible business requires significant efforts of companies in the development and implementation of numerous strategic decisions, technological and technical solutions in production and management, as well as innovative solutions that together will lead to optimal fulfillment of the interests of all stakeholders (Brkljač et al., 2022).

Transformation of companies towards the concept of circular economy requires radical changes in business models and processes, including supply chains, production, product development, consumption. The digital age in which we live and work has many opportunities for these transformations by enabling new business models and redesign of business processes towards a new circular economy.

2.2. The banking industry and circular economy

The sphere of circular economy is very complex and demands a multidisciplinary, holistic approach, through involving different stakeholders. Among various stakeholders in the Republic of Serbia, commercial banks should be specially emphasized, since banks are the most important segment of the financial sector.

Additionally, banks have already included in their lending policies the aspect of energy efficiency, environmental protection, and other areas that speed up the development of the circular economy. The circular economy became a new field of competitive battle between financial market participants. Furthermore, it became an important strategic tool, based on which commercial banks create their competitive advantage (Lukić & Mirković, 2017). On the one hand, banks need to provide sufficient funding to circular businesses, while on the other hand they need to make internal transitions from a linear toward circular economy.

When it comes to observation of the banks and their connection with circular economy, there should be considered the following (Taylor et al., 2008):

- circular economy represents a relatively small part of the overall banking business;
- the level of knowledge and awareness about circular economy in banks is relatively low so they treat it like something outside their regular business scope;
- banks do not possess the adequate level of readiness in terms of existing procedures and policies which could easily accelerate the integration of circular economy;
- transaction costs of projects in a circular economy could be an additional barrier for banks.

Financing activities related to projects in the field of circular economy had a continuously increasing portion in the offers of international financial institutions. International financial institutions such as: European Investment Bank (EIB), World Bank (WB) or European Agency for Reconstruction and Development (EBRD) support local banks through funds aimed for: green economy, reducing the negative effects of climate change, and renewable energy sources, etc.

In the Republic of Serbia, the area of energy efficiency is firstly recognized by commercial banks as very attractive with great potential for loan portfolio growth. Also, in Serbia green economy projects are implemented mainly in cooperation with public companies and local self-government units through special purpose credit lines. Bearing in mind the importance of the public sector in assessing the benefits of investments in the green economy, EBRD cooperates with local financial institutions (mostly, commercial banks) with a tendency to adequately present the EBRD business model.

2.3. The implications of circular economy projects in "Erste Bank a.d." Novi Sad

Local banks are in the center of the loan disbursement process for loans aimed in the field of the circular economy (Lukić & Mirković, 2017). In the research of Lukić & Mirković (2017) among Serbian commercial banks, twelve of them are identified as banks which had loans in portfolios that are primarily related to energy efficiency. "Erste Bank a.d." Novi Sad (as a part of Austrian-based Erste Group AG) is one of them. Furthermore, this bank continues to focus on the circular economy through various projects described in this title.

Erste Bank a.d. Novi Sad bought in 2005 Novosadska Banka which was the oldest financial institution in Serbia, established in 1864. The focus of Erste Bank a.d. Novi Sad is on operations with clients, small and medium-sized organizations, as well as the local community. The key goal is to expand the base of satisfied clients, and to increase market share in key segments, while contributing to stable growth, high speed and quality of services. Erste Bank a.d. Novi Sad has high standards regarding corporate social responsibility and adheres to the requirements of United National Global Compact, UN Sustainable Development Goals, and the Global Reporting Initiative (Terzić, 2021). Since 2008, Erste bank a.d. Novi Sad has regularly published annual corporate social responsibility reports in which it presents all conducted activities and initiatives. Corporate social responsibility represents an integral part of its long-term business strategy.

Erste Bank a.d. Novi Sad has financed a lot of projects which could be generally divided into two segments: first, projects in the field of renewable energy sources and energy efficiency projects; and second, financing from international financial institutions as a support for circular economy. This is shown in Figure 1.

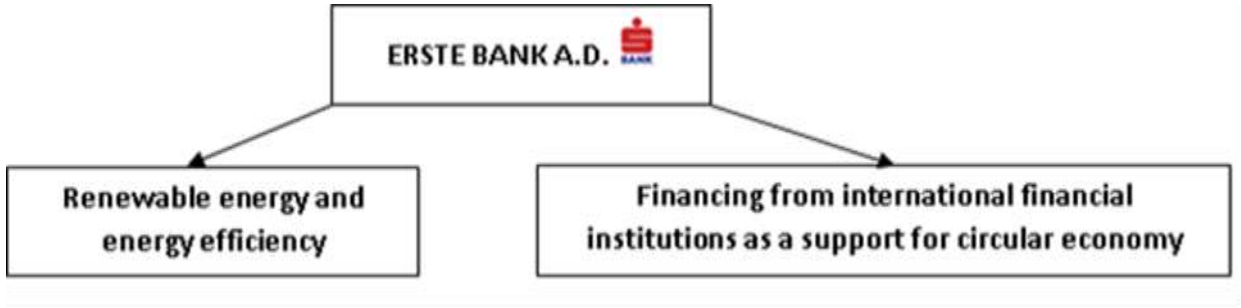

Figure 1. Model of circular economy in Erste Bank a.d. Novi Sad
Source: Authors based on data from Erste Bank (2022)

Regarding renewable energy sources and energy efficiency projects, Erste Group has so far financed over 60 projects in the field of use: wind, water, solar, biomass, and biogas. Totally, Erste Group has invested over EUR 220 million in renewable energy projects in the Republic of Serbia (Erste Bank, 2022). Some examples of good practice from this area are related to financing: solar panels, cooling and heating systems, water systems, electric cars, wind farms, plants for recycling and waste sorting, LED lighting projects, etc. Erste Bank a.d. Novi Sad established cooperation in the segment of financing, as a support for the circular economy, with the following international financial institutions: European Investment Bank (EIB), German Development Bank (KfW), European Agency for Reconstruction and Development (EBRD) and Council of Europe Development Bank (CEB).

Cooperation between Erste Bank a.d. Novi Sad and **EIB** is realized through a support package

named “EIB Team Europe COVID-19". This support is designed not only for small and medium-sized enterprises, but also for enterprises with less than 3,000 employees, providing them with access to a source of lower financing costs and flexible repayment terms. Those funds could be used for several purposes, such as: purchase, reconstruction or expansion of fixed assets, intangible investments, and working capital needs. Funds could be used for financing investments with maximum total costs of EUR 25 million. The maximum share of the EIB should not be greater than EUR 12.5 million (Cirkularna ekonomija Erste Bank, 2022). Also, there is an Apex loan for small and medium enterprises and other priorities which is concluded with EIB. These arrangements are related to financing of small and medium-sized projects as well as business projects for the youth of the Western Balkans region.

Funds from the German Development Bank (**KfW**) could be used with the following purposes: reconstruction, renewal, renovation, and with the objective of investments in fixed assets and reduction of energy consumption, guarantees for achieving neutral effects of CO_2 emissions and use of renewable energy sources.

EBRD projects regarding circular economy are related to two types of arrangements:

1) *EBRD RF - Resilience Framework Program* (Covid-19 support) – as a type of adequate response on economic consequences caused by Covid-19 pandemic; and
2) *EBRD CSP - Competitiveness Support Program* – energy efficiency lines in total amount of EUR 5 million for financing: solar panels, machines for production, production facilities etc. After the successful implementation of the investment project, end users have the right to non-refundable funds (grant) at the level of 15% of loan amount (Cirkularna ekonomija Erste Bank, 2022).

Erste Bank a.d. Novi Sad has also signed agreement with Council of Europe Development Bank - **CEB**, as a way of support to small and middle enterprises for opening and maintaining of sustainable business. The highest amount for investment loans is limited to EUR 2 million, while the cap for loans with working capital needs is set at EUR 1 million (Cirkularna ekonomija Erste Bank, 2022). Beside abovementioned projects from circular economy and arrangements with international financial institutions, Erste Bank a.d. Novi Sad has been engaged into recycling. Namely, the bank has financed the project of the company for disposal of industrial and municipal waste and its transformation into a harmless material with useful value, in the amount of EUR 2.3 million. As a result with great support of Erste Bank a.d. Novi Sad, waste was transformed into a completely harmless neutral material generally called “NEUTRAL” which is predestined for further commercialization in construction, energy, road construction, process industry, etc.

CONCLUSION

Circular economy represents a new approach to a sustainable development and economy that appeared as a response to the global environmental crisis. The main focus of the circular economy is to prevent damage to the environment and reduce pollution by ensuring the production process through clean technologies. The basic principle of circular economy is long-term and sustainable green growth, and green behaviour through the appliance of recovery, recycling, repurposing, remanufacturing, refurbishing, as well as the concepts used to repair, reuse, reduce, rethink, and refuse products and natural resources. That is the reason why the circular economy requires active involvement and participation of various stakeholders – not only government, organizations, companies, employees, but also suppliers, citizens, non-governmental organizations, intergovernmental organizations, as well as the academic community and entire educational system.

Digital technologies represent one of the key enablers of the circular economy concept. Through history, new technological solutions lead to new chances and opportunities. Among the most important new technologies that fostered a circular economy are: Internet of Things, Big Data, Real-Time Analytics, Artificial Intelligence, Blockchain, etc. and the possibilities for predictive analytics, real-time tracking and monitoring of the entire product life cycle, and data-driven decision making. The key potentials and benefits of digital technologies in the field of circular economy are: smart products and services that may stimulate the optimal use of resources and materials, many opportunities in the field of traceability and transparency of resources and products, more resource-efficient products, increased efficiency and reduced environmental impact, optimized sales and logistics, as well as optimized waste management and recycling with the aim to keep the raw materials in the system as much as possible.

In this paper is pointed out the role and importance of the commercial banks in the application of the circular economy in the digital age. Commercial banks are the most important segment of the financial sector. Additionally, banks have already included in their lending policies the aspect of

energy efficiency, environmental protection, and other areas that speed up the development of the circular economy. The focus of commercial banks towards a circular economy not only brings benefits for the environment, but also means: a higher level of business efficiency, a greater degree of resistance to errors, and a reduction of costs in business. The business process itself in banks increasingly tends to eliminate the use of paper forms and documentation and emphasizes the electronic recording of all transactions. In this way, the green economy in banks becomes a relevant factor in every business segment.

Commercial banks in the Republic of Serbia have recognized the significance of circular economy projects and the funding in this area has continuously increased. In this paper is presented the case study of Erste Bank a.d. Novi Sad and its engagement in various projects regarding the circular economy. Erste Bank a.d. from Novi Sad has financed projects in the field of renewable energy sources and energy efficiency, and provided financial support for the circular economy. This bank has been engaged in recycling through the project for disposal of industrial and municipal waste and its transformation into a harmless material with useful value, in the amount of EUR 2.3 million.

The key conclusion of the paper is that circular economy will be dominant model of the economy in the future. Orientation toward the concept of circular economy is very important not only in business field, but also from the aspect of everyday life, so increasing interest for this topic is more than justified in the digital age. For that reason, the engagement of commercial banks in the circular economy will contribute to the socially responsible behavior, as well as to greater profitability and competitiveness of banks in the digital age.

The paper has some limitations which refer to the fact that only one bank was used as the case study, so the obtained results cannot be generalized. However, presented results give leaders, managers, and other decision-makers valuable facts and observations for some future intentions and projects in the field of circular economy. The proposition for future research on this topic is to encompass a larger number of banks and to investigate their activities and achieved results in the field of circular economy.

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