

CIRCULAR ECONOMY – BARRIERS AND CHALLENGES¹

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Abstract

The circular economy (CE) today has a growing importance for businesses, consumers and the environment in general. The CE is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended.

Namely, moving towards a more circular economy could deliver benefits such as reducing pressure on the environment, improving the security of the supply of raw materials, increasing competitiveness, stimulating innovation, boosting economic growth and creating jobs. Consumers will also be provided with more durable and innovative products that will increase the quality of life and save them money in the long term.

The main purpose of the paper is to examine the awareness for CE concept and the need for applying CE principles in a way to ensure a better environment and life quality.

To achieve the aim, a survey was conducted and conclusions and recommendations will be presented based on data processing.

Key words: circular economy, barriers, challenges

¹ original research paper

INTRODUCTION

Circular economy is currently a popular concept for future sustainable development. It's the biggest driver for business transformation, thanks to shifting consumer attitudes that are forcing businesses to change. The concept of circular economy is based on strategies, practices, policies and technologies to achieve principles related to reusing, recycling, redesigning, remanufacturing, refurbishing, and recovering water, waste and nutrients to preserve natural resources. Some of the major goals in operating a circular economy might be to address specific sustainability and environmental issues, with resource depletion, emissions, pollution, and environmental degradation being just a few examples.

The main purpose of the paper is to examine the awareness for CE concept meaning and the need for applying CE principles in a way to ensure a better environment and life quality. To achieve the aim, a survey was conducted electronically and the target group was managers of the companies in the Republic of North Macedonia.

The rest of the paper is organized as follows. Section 2 deals with some previous work on this topic. Section 3 gives theoretical overview and introduce briefly the readers with CE concept – benefits, challenges etc.. Section 4 provides insights into the data, methodology, and results of the analysis. The last section concludes.

RELATED RESEARCH

Some studies have attempted to measure the implementation of the CE, but they have tended to focus on specific contexts and pockets of good practice. The exploratory survey (Masi et al, 2018) based study of 77 companies investigates the shift towards the CE using a comprehensive taxonomy of practices and barriers. The results show that firms favour practices related to resource and energy utilisation efficiency, while practices related to investment recovery, green purchasing and customer cooperation are less prevalent. Eco-design practices and internal environmental management practices have a medium level of implementation.

Jaeger & Upadhyay (2020) in their paper present barriers to CE adoption identified by a literature review. The literature review is followed by a case study identifying barriers to CE as seen by ten companies within

manufacturing, including the GS1 global information standardisation agency used by all manufacturers. The manufacturers investigated focus mostly on recycling and waste reduction. These policies have low or very low CE effect. High CE effect policies like maintenance and reuse targeting the CE ideal of no waste, are nearly non-existent. The results identified seven main barriers to the CE: high start-up costs; complex supply chains; challenging business-to-business (B2B) cooperation; lack of information on product design and production; lack of technical skills, quality compromise and disassembly of products is time-consuming and expensive.

Cardoso et al (2002) in their research performed descriptive analysis of 416 documents using bibliometric techniques, in order to gather existing knowledge in circular economy focusing on waste management (2007–2020). The results of this study indicate that annual scientific production increased 94% in the last 5 years, highlighting the countries of Italy, Spain, the UK, China, Brazil, and India. Between the most cited documents stand out those related to calorific value of municipal solid waste and waste to energy technologies for achieving circular economy systems. The conceptual analysis indicates strong linkage between circular economy and sustainable production, waste management, and recycling.

Shivarov (2020) in his paper explores the challenges to circularity and he states the following key challenges: physical limits to recycling and recovery; circular economy proponents view the concept as intrinsically sustainable, but it may not produce sustainable outcomes under various conditions; patterns of technological development pose two opposing challenges to circularity one challenge is overcoming path dependencies and lock-ins in order to realize the shift from a linear to a circular economic model and another challenge is the disruptive nature of technological innovation; fourth, intra-organizational (firm) and inter-organizational (industry) objectives and strategies lead to conflicting interests and sometimes will result in contradictory outcomes and fifth, the social and cultural dimensions of circular economy remain overlooked in the existing literature on the topic.

The conclusions of a study carried out by the Sonocom survey institute for hub.brussels, the Brussels Agency for Business Support (2019) are: of the 400 companies located in Brussels surveyed by the Sonocom institute as part of the circular economy awareness study the conclusions are as follow: 74.8% had never heard about the concept: 45.4% have however implemented at least one circular economy process, notably by reducing their water, energy or raw materials consumption or by purchasing sustainable resources (32%). The top five benefits of the circular economy are: a reduction in resource consumption (44%), a decrease

in waste production (38%), customer retention (25%), reduced operating costs (24%) and the acquisition of new customers (23%).

Rizos et al (2016) have analyzed the barriers and enabling factors identified by SMEs during the implementation of their circular economy business model. For the analysis, the SMEs were selected from the GreenEcoNet platform, using a restrictive set of criteria in order to make the conclusions relevant for “circular economy” initiatives. This research indicates that despite the various policy instruments available to facilitate the “green” SME transition, several barriers to such a transition exist. Most SMEs in the case studies mention “lack of support from their supply and demand network” and “lack of capital” as barriers to “going green”. The paper also indicates several enabling factors that could provide additional information to policy-makers on how to support SMEs. Specifically, the results of this research demonstrate that the success of SMEs in transitioning to a circular business model depends on how well this process is supported by: a company culture with a “green” mindset on the part of the staff and manager; a local or regional network with other SMEs and supporting multipliers to enhance information sharing and awareness raising; and the benefits of having a “green” image and being recognized as a “green” supplier.

THE CONCEPT OF CIRCULAR ECONOMY

Since the linear consumption reaches its goals the need to transition to circular economy is more than obvious. The transition is need to introduce changes throughout the product life cycle, the design of the products, new business and market models, new conversion technologies of waste into a resource, improved consumer behavior, changes in innovation systems etc. The ‘Circular Economy’ is a popular concept for future sustainable development promoted by the European Union and there is no one uniform definition for what a circular economy is. The World Economic Forum “define a circular economy as an industrial system that is restorative or regenerative by intention and design. It replaces the end-of-life concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse and return to the biosphere, and aims for the elimination of waste through the superior design of materials, products, systems, and business models”. Also Ellen McArthur Foundation’s gave the following definition: “an industrial system that is restorative by intention and design, which aims to use renewable energy, eliminates the use of toxic chemicals and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models. Another

interpretation of the emerging concept views circular economy as an umbrella term covering all activities that reduce, reuse, and recycle materials in production, distribution and consumption processes (Blomsma & Brennan, 2017).

The principles of the circular economy in different scientific research are formulated differently depending on the area of interest. But usually the CE concept is based on three principles: reduce, repair-reuse, recycle (4R) .

The initial concept for CE started in 1983, when the United Nations General Assembly asked the prime minister of Norway Gro Harlem Brundtland to establish an independent commission to explore ‘a global agenda for change’ with the intention of formulating ‘long-term environmental strategies for achieving sustainable development by the year 2000 and beyond’.

Kirchherr et al. (2017) argue that circular economy aims to contribute to sustainable development and Suárez-Eiroa et al. (2019) add that circular economy operates under the banner of a sustainable development framework.

The transition to a circular economy requires radical change in the way of production guidance and consumption. In circular economy products are designed to be durable, to be able to be improving, for repair and multiple use, with a purpose reuse of materials of which they are made after they reach the end of their century.

The scientific literature contains large number of best practice examples of CE from well known commercial enterprises and businesses or research groups in industrial countries. The majority of practices are useful models to recycle and reuse materials for the same or new products, reducing energy use and offering drastic reduction of waste.

There are a lot of benefits from circular economy. Measures such as waste prevention, ecodesign and re-use could save EU companies money while also reducing total annual greenhouse gas emissions. Currently, the production of materials we use every day account for 45% of the CO2 emissions. Moving towards a more circular economy could deliver benefits such as reducing pressure on the environment, improving the security of the supply of raw materials, increasing competitiveness, stimulating innovation, boosting economic growth (an additional 0.5% of gross domestic product), creating jobs (700,000 jobs in the EU alone by 2030). Consumers will also be provided with more durable and innovative products that will increase the quality of life and save them money in the long term. (News European Parliament, 2015).

In a world where only 9% of the economy is circular, it's calculated that the opportunity to profit from the conversion of the remaining 91% sits

around \$4.5 trillion. This means the circular economy is the biggest wave of business transformation that companies are embarking on since the industrial revolution. On the other hand, there are numerous barriers that prevent the implementation of the concept of circular economy, such as: environmental culture; financial barriers; lack of government support and effective legislation; lack of information; lack of technical skills; lack of support from the supply and demand network etc.

To support the transition towards a circular economy, businesses will have to change their business models. Business models should focus on developing existing ones or new products and processes who want to optimize it circularity. The models for optimum aim to increase the product value and use. These business models are often based on retained ownership of a product, for example through collateral of service instead of selling a product or taking responsibility for the product during its useful life. The return models of value focus of maximizing recovery and recycling of products and materials after use in new products or useful resources in order to reduce spending and to save the resources. The development of reverse logistics, ie. the return from the point of consumption to the point of production, is essential to this one model. The models to support the circular economy are focus on managing and coordinating circular value networks and resource flows and optimizing incentives and other support activities in a circular network. These support business models, also include the development or deployment of key enabling technologies support, enabling and facilitation of other business models. (Circular economy guide)

What has been done in the EU to encourage the circular economy?

EU has taken a lot of measure to become a circular economy. In March 2020, the European Commission presented the circular economy action plan, which aims to promote more sustainable product design, reduce waste and empower consumers, for example by creating a right to repair). There is a focus on resource intensive sectors, such as electronics and ICT, plastics, textiles and construction.

In February 2021, the Parliament adopted a resolution on the new circular economy action plan demanding additional measures to achieve a carbon-neutral, environmentally sustainable, toxic-free and fully circular economy by 2050, including tighter recycling rules and binding targets for materials use and consumption by 2030.

In March 2022, the Commission released the first package of measures to speed up the transition towards a circular economy, as part of the circular economy action plan. The proposals include boosting sustainable products, empowering consumers for the green transition, reviewing construction product regulation, and creating a strategy on sustainable textiles. (European Parliament, 2022)

Also European Commission prepared a "Green Plan for the Western Balkans", as one of the regions that is largely dependent on fossil fuels and the most severely affected by climate change.

RESEARCH METHODOLOGY AND RESULTS

In order to give new prospect to this issue, a survey was conducted in June 2022. The survey comprised 65 companies from North Macedonia. The businesses that were part of the research are usually from the manufacturing industry wholesale and retail trade and all respondents were managers responsible for day-to-day business processes – usually the entrepreneur, and otherwise a general manager.

The questions were divided into 3 groups. The first set of questions concerns general company data. The second group of questions refers to the awareness of managers about the concept of circular economy. The third group of questions are related to the implementation of the circular economy concept.

On the basis of data analysis from the first group of questions, the following results have been obtained: from the businesses-respondents, 48 were older than 10 years, 17 were older less than 10 years. Most of the respondents, i.e. 23 are small, 31 medium and 11 large companies. The most of the managers of the businesses that were part of the survey had more than 10 years of work experience.

The second group of questions refers to the awareness of managers about the concept of circular economy. On the question “How much do you know about the circular economy concept?” 5% of the respondents answered that is an expert for CE, 29% that are informed, 46% knows a little about it and 20% doesn’t heard about the CE.

Figure 1

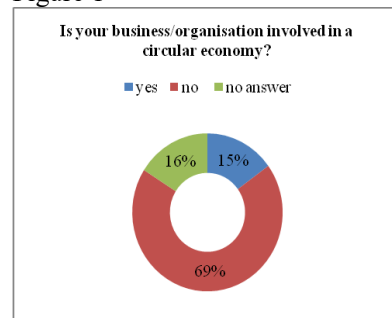
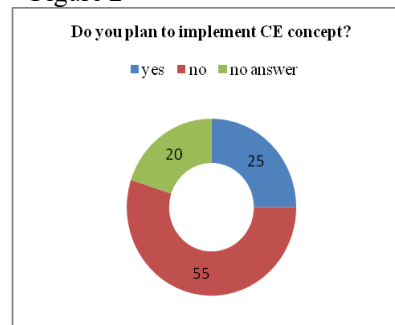


Figure 2

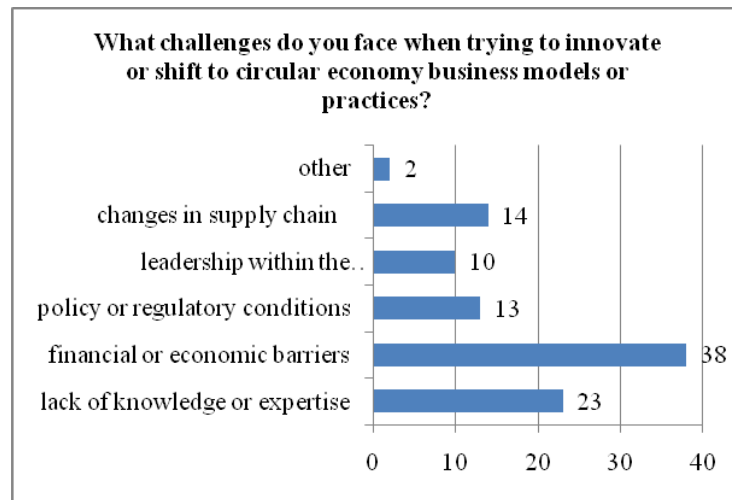


Results of the own research

As can be seen from the data in “Fig. 1”, only 15% of the respondents answered that their company was involved in CE. Really it’s a very small number of companies that apply this concept and the results of the next question shows that there is not interest among investigated companies in applying the CE principles, only 25% plan to implement CE concept. On the next question “Does the existing business model of your company allow for a shift towards a Circular Economy model?” only 35% answered in the affirmative, 57 in the negative and 8 didn’t give an answer.

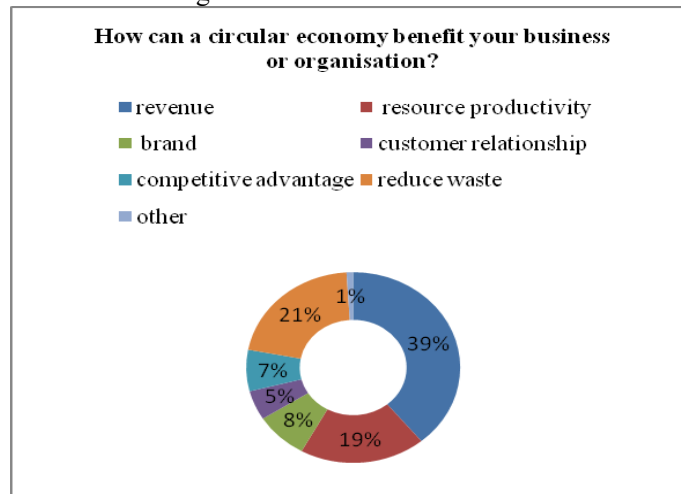
For applying the CE concept businesses have been faced with numerous challenges and according to the research results the biggest challenge is financial or economic barriers (See Fig. 3).

Figure 3: Results of the research



The results of the question “How can a circular economy benefit your business?” are as follows: 39% of the respondents thought that the benefit is revenue, 19% resource productivity, 8% brand, 5% customer relationship, 7% competitive advantage, 21% of the respondents answered reduce waste is a key benefit and 1% other.

Figure 4: Results of the research



The results of the question “Have you attended seminars, trainings to better inform yourself about the meaning of CE concept and CE principles” present that only 21% of the respondents have attended a seminar, training in order to better inform about the meaning of the circular economy concept and CE principles.

The next question is “Do you think that Government in North Macedonia have been taken enough measures for improving the implementation of CE concept?” and 21% answered in the affirmative, 61% in the negative and 18% didn’t give an answer.

The results that emerged allow to formulate conclusion that a very small number of companies apply the concept of circular economy hence it’s necessary to encourage awareness among managers, employees and consumers about the benefits of the CE concept and the need for its implementation as soon as possible.

CONCLUSIONS

The circular economy is the biggest driver for business transformation, thanks to shifting consumer attitudes that are forcing businesses to change. In simple terms, the circular economy assumes the implementation of dynamic systems, where there’s no specific endpoint for the business processes across the supply chain or across all consumer touchpoints. A circular business model can spur growth, reduce costs, and build resilience. It should be recognized that the laws of nature do not allow a process without waste and energy loss, so circularity will always be limited by physical parameters.

The results of the research show that there is little implementation of CE concept among our companies, The companies are facing with numerous barriers and challenges such as: lack of knowledge or expertise, financial or economic barriers, policy or regulatory conditions, policy or regulatory conditions, leadership within the organisation not supportive, changes in supply chain etc.

In order to encourage and increase awareness of the importance of the circular economy, we propose the following measures: increasing the company environmental culture; networking; support from the demand network; increasing the personal knowledge; Government support.

Future studies may focus on exploring the ways for improving company competitiveness through circular solutions.

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