

A THEORETICAL OVERVIEW OF THE IMPACT OF THE CIRCULAR ECONOMY ON A STATE'S ECONOMY

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ABSTRACT

The Circular Economy (CE), as a possible transformation of economies, became very popular and widely discussed from 2015 when the worldwide importance of ecological preservation became highly in demand. To be able to implement the circular economy concept in various economies, its importance and prepared alterations to government regulations have to be widely discussed, and at the same time businesses and consumers have to prepare to live and work in the new paradigm. Consumers have to note the additional value of circular products and services, and their positive impact on health and the environment. Businesses will only start changing when they realise that new business models are available and they can keep profitability at the same level, even though consumption in general might change. The main aim of this article is to perform a theoretical analysis of the impact of the circular economy on a state's economy. The main tools used for the research in the article were analysis, comparison and the summary of scientific literature. The article overviews possible changes and their impact on state economics in the future.

KEY WORDS: *circular economy, circular business models, impact analysis.*

JEL CODES: E66, O11, O44, H0.

DOI: <https://doi.org/10.15181/rfds.v37i2.2430>

Introduction

According to Sassanelli *et al.* (2019), the appearance of the concept of the Circular Economy (CE) is traced to Ellen MacArthur in 2005. Since then, it has been analysed by many authors, and already involves business entities and policy-makers. As Sassanelli *et al.* (2019) and Pintilie (2021) state, the spread of publications in the field of the CE has increased since 2015, and the highest number of contributions come from European countries (57.8%), followed by China. From 2015 to 2020, the number of papers included in the main flow of publications grew quite fast, showing the growing interest in the theme.

European Union documents (52021IP0040, 2021) on the Green Deal list the challenges that countries, cities, businesses and individuals will meet in accepting the main concepts of the Circular Economy. Research by Pintilie (2021) revealed that the EU's economy is expected to continue growing, and taking into account climate change, there is a very clear need to make the transition to renewable energy. To quicken the spread of the Circular Economy, perceptions of consumers and producers have to be changed. Leading authors Abokersh *et al.* (2021), Reddy, Kumar (2020), and Feng and Lam (2021) state the importance of educating society and increasing knowledge about environmental issues that arise because of the linear economy. An acknowledgement of the positive impact of the Circular Economy on the environment can appear, with policy-makers and governments changing fiscal policy regulations motivating businesses to look for

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circularity solutions. Other authors, such as Centobelli *et al.* (2020) and Hussein and Hamdan (2020), state the importance of changes to government regulations; and Li *et al.* (2019), Clift and Druckman (2015), and Geissdoerfer *et al.* (2018) discuss in their articles new business model approaches.

The *scientific problem* for this scientific research is to identify how the implementation of the Circular Economy (CE) will affect state economics.

The object of the research: the development of the Circular Economy.

The aim of the research: to perform a theoretical analysis of the impact of the Circular Economy on a state's economy.

The tasks of the research: 1. To analyse the essence of the Circular Economy concept; 2. To identify the possible effect of the Circular Economy on a state's economy.

Research methods: analysis, comparison and generalisation of scientific literature.

1. The concept of the Circular Economy

To analyse the concept of the Circular Economy (CE), we have to look at the main terms that are used to describe it. Geissdoerfer *et al.* (2017) state that a definition of the Circular Economy should use the concept of a regenerative system, in which resource input and waste, emission and energy leakage, are minimised by slowing, closing and narrowing material and energy loops. The CE helps to close the cycles of energy and materials to make full use of the available resources, instead of continuing to exploit them and increasing the damage to the environment, and does not go against economic growth (Jaca *et al.*, 2018). The narrower material and energy loops 'can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling' (Geissdoerfer *et al.*, 2017). According to Bansal *et al.* (2020), the Circular Economy can be defined as a global economic model that minimises the consumption of finite resources by using a more advanced and innovative design of materials, products and systems.

One of the initiators of the Circular Economy concept that spread all over the world, the Ellen MacArthur Foundation (2014), discusses the importance of replacing the idea of end-of-life with reorganisation, and shifts to the use of sustainable resources, to eliminate utilisation by a more advanced level of substance, processes and business designs of chemical pollutants that impact reusability and waste reversion.

According to Abokersh *et al.* (2021), the circular economy can be outlined in large part as an industrial system that is intentionally and in terms of design restorative or regenerative. Yuan, Bi and Moriguchi (2006) give the same explanation, that it can be restorative or regenerative by intention and design. This can describe the Circular Economy in the metaphorical aspect of circularity. 'Restorative' conjures up a circuit of endless use, reuse and repair. 'Regenerative' speaks of a sort of life cycle that maintains and upgrades conditions of ecosystem functionality (Morseletto, 2020).

Jaca *et al.* (2018) describe the Circular Economy, structuring it into six areas of action. The fields of action are: 1) take, 2) make, 3) distribute, 4) use/consume, 5) recover, and 6) industrial symbiosis (Jaca *et al.*, 2018). These areas of action should help companies move over to the circular paradigm through the analysis and diagnosis of their actions. According to Stahel (2016), it 'replaces production with sufficiency: reuse what you can, recycle what cannot be reused, repair what is broken, remanufacture what cannot be repaired.'

To be able to move closer to the Circular Economy, there should be some changes made to consumption, as the Circular Economy not only minimises the consumption of finite resources in the manufacture of products, but, according to Reddy and Kumar (2020), also promotes the reusability of products, by maximising the circulation of the content of end-of-life products.

Howard (2018) states that to be able to ensure the transition towards the Circular Economy, deep changes should be made to patterns of linear production and consumption and the redesign of systems that have grown and become entrenched over many decades. Indicators are a key way by which companies report on their performance, both internally and externally. They also represent a key system enabler, driving practice, innovation and opportunity identification for value creation (Howard, 2018).

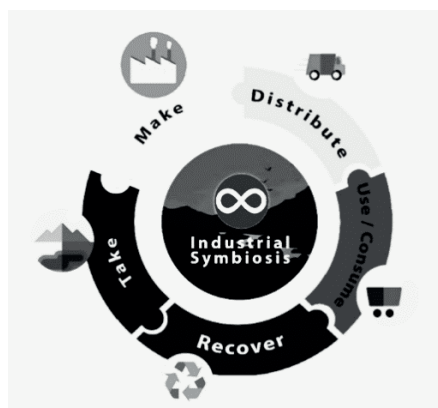


Figure 1. Circular Economy areas of action (Prieto-Sandoval, 2021)

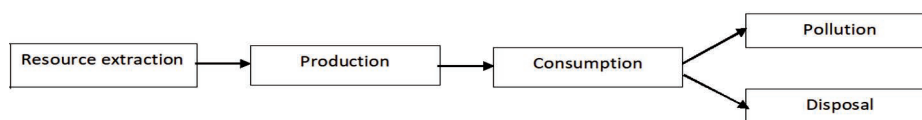


Figure 2. The linear economy (Ellen MacArthur Foundation, 2016)

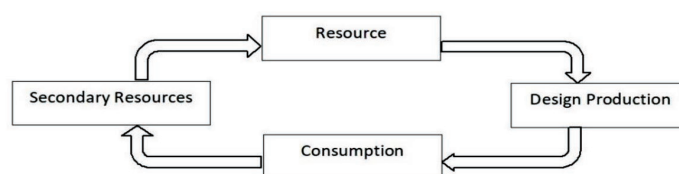


Figure 3. The Circular Economy (Ellen MacArthur Foundation, 2016)

Meanwhile, Drazic *et al.* (2021) discuss how the goal of the Circular Economy is to optimise the existing system and increase welfare, and that the growth trend for alternative fuels is evident in the world from year to year, thanks to the development of new technologies for processing biological waste into energy sources. Abokersh *et al.* (2021) state that environmental pressures are closely related to material use, and to reduce environmental pressures it is required to circulate and use the contribution of the Circular Economy to environmental sustainability. Commercial production needs to be economically and environmentally friendly, so that biofuels from renewable sources are an adequate substitute for fossil fuels (Drazic *et al.*, 2021).

Geissdoerfer *et al.* (2017) state that the Circular Economy is the reverse of the current practices of rapid resource depletion and waste generation, and it has to offer new circular business models that emphasise recycling, remanufacturing and refurbishment in the design of eco-innovative products and services on the market.

So, generalising the scientific discussion about the concept of the Circular Economy, it should be stated that it is a new approach to the economy and business, including a new philosophy of consumption, technologies for production, and restoring materials in a circular way.

2. Research methodology

A theoretical literature review analysis, considering the main principles of comparison, structuring, analysing and the synthesis of scientific publications in the Circular Economy topic, is used in this article. As the aim of the article is to analyse the possible impact of the Circular Economy on a state's economy, it is important to review the scientific discussions by various authors on this topic. The possibility to see forthcoming changes in a state's economy will bring knowledge on how to prepare better for the application of the Circular Economy in real economies.

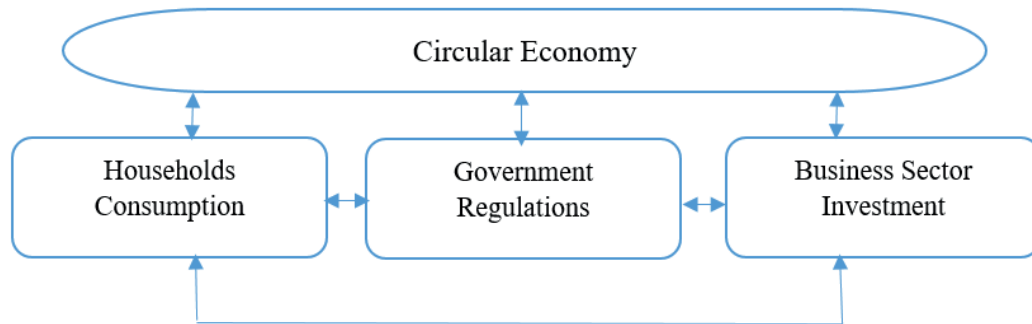


Figure 4. The theoretical research methodology

The main parts of GDP have been taken as the core of the analysis here. Consumption (C) is the income that households, non-profit organisations, need for products and services. Investment (I) represents the incentives of commercial sector players to invest in business. The appearance of the Circular Economy will bring the need and possibilities to change business models. Possible changes to the appearance of the Circular Economy in businesses do not empower them to start changing without finding new possible business models that will allow them to keep the same business outcomes and satisfy their consumers better.

Government expenditure (G), in this instance not analysed, but overviewing the possible regulation changes relating to fiscal policy, and also the possible impact of the Circular Economy on ecology, which is usually supervised by government institutions, and possible changes in regulations on pollution and recycling rules. As the incentives for the spread of the Circular Economy in various states can be increased by governments, there is a need to overview possible legal changes.

3. Changes to a state's economy in the context of the Circular Economy

To be able to analyse the impact of the Circular Economy on a state's economy, it is necessary to analyse how various parts of the economy might change in the context of the Circular Economy. First, there should be a general understanding of how the concept of the Circular Economy covers consumption (with changes in consumer preferences and at the same time products and services), and the investment changes: the business sector's demand for raw materials and technologies, and also business models that should appear anew in the context of the Circular Economy. Second, possibilities for consumption and investment as part of Gross Domestic Product (GDP) to change the state's economy will depend on government regulations that enable movement towards circularity in business.

3.1. The impact of the Circular Economy on consumption

The authors Feng and Lam (2021) state that a willingness to pay a premium for 'greener' products is influenced by a customer's income level and educational background. According to Centobelli *et al.* (2020), the

Circular Economy does not mean only doing more with less, or being environmentally friendly. It also aims to maximise a product's life cycle along the whole supply chain, and to convert unusable products into new sources of value in the same supply chain or in others (Centobelli *et al.*, 2020). Prieto-Sandoval *et al.* (2021) performed research in a focus group that showed the transversal criteria that must be included in the whole process: human commitment and the creation of value through the Circular Economy. The findings of the study refer to people's encouragement to adopt responsible businesses and environmental knowledge, and awareness.

Sassanelli *et al.* (2019) discuss that 'from a companies' portfolio circular innovation perspective circular KPIs can support not only the decision making process along the design of new products but also the comparison of different versions of the same product based on their degree of circularity and the benefits they can bring'. This can create the ability for companies to compare different circular products by the benefits they can achieve. Abokersh *et al.* (2021) state that a product can be extended, and that a beneficial effect can be reflected in the utility, and the presumption of the greatest longevity in good materials is the best option. On the other hand, this can have an effect on production output, as the demand for new products will eventually decrease.

3.2. The impact of the Circular Economy on investment and business sector performance

In analysing possible changes in the use of materials in economies, the authors Abokersh *et al.* (2021), and Reddy and Kumar (2020) discussed how a significant factor in a company's success is its ability to match its supply to uncertain demand by utilising different types of resources (capacity and inventory), and that there is a difference between virgin (raw material) and non-virgin (reused, revamped, repaired or rehabilitated) materials that are part of a product and may be applied to a production process which has to be borne in mind when moving towards the Circular Economy. A product is then produced with a variety of parts: sub-assemblies, sections and/or materials. A bill of material can define all the materials centered on the scale of specifics (Abokersh *et al.*, 2021). Amid uncertainty of demand, capacity adjustments are discrete, because capacity size is adjusted before the realisation of demand (Reddy, Kumar, 2020).

While moving towards the Circular Economy in various states, possible positive changes in ecology have to be borne in mind. Mahajan (2021) in his article states that 'Germany has earned a lot of money by recycling, a large number of people have been employed in CE projects, the emphasis on imports of raw materials has reduced, greenhouse gas emissions reduce, and emissions seriously harmful to human health reduce.' While Vetrova and Ivanova (2021) discuss how the transition to a Circular Economy at a micro-level should build an effective waste management system and create an institutional and regulatory environment. According to Mahajan (2021), recovery, reuse and recycling of resources, circular supply chains, new business models, product life extension, and deep technological innovations are major problems in municipal and private waste management policy.

According to Abokersh *et al.* (2021), a substance produced for excessive lives, which ends up as energy rehabilitation or landfill, is not a circular but a gradual linear operation. The authors state that it seems to be a debate between environmental efficiency and eco-effectiveness. The aim of eco-effectiveness is not to reduce the flow of materials from cradle to grave, but to create cradle-to-cradle metabolisms that allow materials to sustain their role as a resource. The connection between economy and ecology is, therefore, strengthened in a positive way (Abokersh *et al.*, 2021). Vetrova and Ivanova (2021) state that increasing the environmental and economic efficiency of individual companies would allow them to save resources within a closed value chain, reduce waste, create new business lines, create additional jobs, and achieve the goals of sustainable development in general. Hussein and Hamdan (2020) view the combustion of gas as a cause of environmental pollution, and it also represents the waste of an important source of energy.

According to Vetrova and Ivanova (2021), the principles of circular production include: the environmental design of the product for its recovery and recycling, the use of eco-packaging for reuse, warehouse management with lean production and on-time delivery, the acquisition of fully recyclable or biodegradable materials, the implementation of environmental management and environmental audits, and principles of non-waste and energy-efficient production. Scientists provide a possible new closed product life cycle that

could end with the ‘restoration of components after the complete dismantling of the product to the state “as new” (remanufacturing); re-processing of components after the complete or partial dismantling of the product into new materials; burning waste for fuel; sending to the landfill for burial’ (Vetrova, Ivanova, 2021).

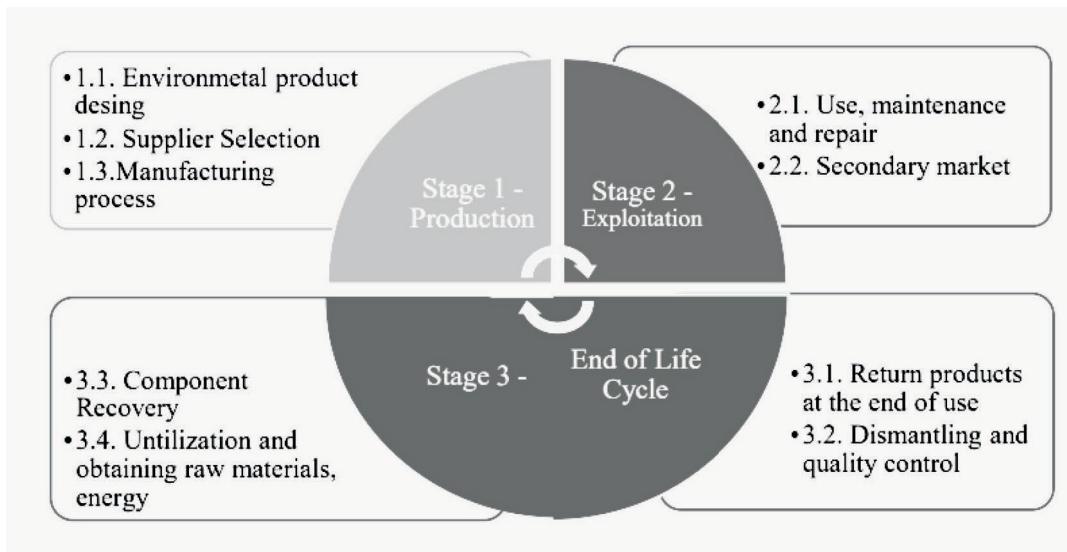


Figure 5. A closed product life cycle (Vetrova, Ivanova, 2021)

Centobelli *et al.* (2020) performed a study that provides a theoretical framework for strategic management scholars, highlighting the relevance of business model issues to the transition to a Circular Economy. In contrast with the linear business model, in which the value associated with a product or service is lost after its use by customers, a circular business model represents a set of strategic decisions designed to preserve the embedded environmental and economic value of a product or service in the system (Clift, Druckman, 2015). A circular business model has been defined as the simplified representation of complex organisational systems and relationships aimed to ‘slow, narrow, and close resource loops’ (Geissdoerfer *et al.*, 2018). Theoretical models also make it possible to understand emerging trends, identify unexplored dimensions and topic areas, and offer elements to inspire future academic studies, the actions of managers, and policymakers’ activities (Centobelli *et al.*, 2020).

Reddy and Kumar (2020) also created a model for the implementation of the Circular Economy and consider the product returns, capacity intensiveness and yield of core returns in a hybrid manufacturing-remanufacturing system. The authors developed a two-stage stochastic model for a hybrid manufacturing-remanufacturing system with a flexible production capacity in the same assembly line. According to Bansal *et al.* (2020), the implementation of Circular Economy models should guide the transition from linear business models of production and consumption to a more resource-efficient model of value creation for societal and environmental gain. The practical transition towards a circular business model requires the continuous monitoring and control of entire changes in the business model dimensions, the verification of Circular Economy targets that have been reached, and eventually the corrective actions (Centobelli *et al.*, 2020).

Ramirez *et al.* (2021) discuss the development of an industry based on converting livestock waste to high-value products, and address complex issues facing the meat and livestock industries. Centobelli *et al.* (2020) underline the role of the emerging digital technologies of Industry 4.0 to support the implementation of some managerial practices to accelerate the transformation of companies. Ramirez *et al.* (2021) also state that the availability of cutting-edge technology will not only enable the industry to expand existing markets, but also to enter those that are emerging. The underlying mechanism of the Circular Economy business model is the reuse of resources on a perpetual basis, starting from the manufacture of ‘circular’ products from

reusable material (product design), and maintaining supply loops by retaining assets in the form of recycled materials, to co-creation with consumers and green human resource management for a competitive advantage (Bansal *et al.*, 2020).

According to Hussein and Hamdan (2020), Iraq is characterised by an abundance of natural and human resources, but this abundance has not been invested in, and instead has been neglected, for it was possible to invest waste water, energy and other resources, especially as Iraqi cities suffer a lot from neglect. As the authors state, the authorities are thinking seriously about getting rid of residents' waste that fills the streets, and then taking care of the population and the environment.

The Circular Economy is an approach that integrates the economy and the waste management system, and is a great chance for the development of each country (Drazic *et al.*, 2021). Analysing possible changes in circular business models, Reddy and Kumar (2020) state that when products are designed in the right way, the products or their main components can be regarded as the perfect substitute for virgin-produced items. According to the authors, virgin products can fulfil customer demand in the primary market, and the remaining products can fulfil customer demand in the secondary market. Ramirez *et al.* (2021) analyse how, by making use of waste, the total economic value for the sector can be increased, even just considering the additional revenue from the increased price of typically low-value co-products. Drazic *et al.* (2021) state that the growth trend in alternative fuels has been evident in the world, and not only the development of new technologies for processing biowaste into energy sources. Gkountani and Tsoulfas (2021) discuss how there are additional challenges to agri-food supply chains, and that multiple factors such as different geographical regions or consumers' willingness to change can change food manufacturing. Feng and Lam (2021) remind us that the micro-level targets an individual product or service manufacture in a Circular Economy and that the production usually applies to learning. Heavily polluting operations that, according to Gkountani and Tsoulfas (2021), need to be reviewed, are considered the most important links between the economic, environmental and social aspects of sustainability. Ramirez *et al.* (2021) note that as 'a major part of sustainable food systems and a steward of the landscape, the industry will be able to continuously support sustainable development, ensuring that people have access to healthy diets and an environment where animals and humans sustainably co-exist.' The authors' analysis of the Circular Economy shows that, together with new business models and processes, products that might eventually have an influence on the health system should be overviewed, as Circular Economy products might positively affect human quality of life and health.

According to Abokersh *et al.* (2021), eco-efficiency, which reduces the need for resources, has a constructive significance, and could include either eco-efficiency or eco-effectiveness collectively with productivity, based on the requirements. Recycling data indicates some achievements in the implementation of the Circular Economy, but there are some challenges and barriers that hinder its implementation (Feng, Lam, 2021). Ramirez *et al.* (2021) state that the resilience of industries which are already sensitive to the effects of climate change has to be borne in mind. Environmental values such as nutrients, water and land are enhanced by the efficient use of resources through the Circular Economy (Ramirez *et al.*, 2021).

The development of the digital Circular Economy, and in particular the closed product life cycle model, is an important task for researchers and scientists, government officials and businesses (Vetrova, Ivanova, 2021).

Reddy and Kumar (2020) have provided situations where remanufacturing will perfectly substitute manufacturing, and also perform an analysis that can help managers to make sound decisions with regard to production quantities for both manufacturing and remanufacturing, while understanding the trade-off of the cost of supply, the cost of capacity and inventories, and the cost of disposal of the revenue from the product demand. According Li *et al.* (2019), in a Circular Economy, products are designed to be waste-free, and negative externality is designed out. And there is a need in the circumstances of a Circular Economy to compare the supply chain members' performances and possibilities for everyone to achieve profit maximisation. For any realisation of uncertainty, profit maximising sales quantity should equalise the marginal revenue of both products (Reddy, Kumar, 2020). Prieto-Sandoval *et al.* (2021) created a methodology that might be a useful tool for consultants to help other firms, especially SMEs, to incorporate the principles of the Circular Economy into their business. Since the extent of remanufacturing operations depends on the quality of the

acquired core, it is considered that remanufacturing is less capacity-intensive than manufacturing, and that remanufacturing is more capacity-intensive than manufacturing (Reddy, Kumar, 2020).

3.3. The necessary governmental impact for the appearance of the Circular Economy

The willingness of companies to make the transition towards a Circular Economy is surely incentivised by relevant contextual factors, such as the regulation activity of policy makers and international institutions (Centobelli *et al.*, 2020). It is very important that governments spread the importance of the Circular Economy, and also help business entities to take incentives to start changing their business models and resource structure.

Feng and Lam (2021), in their article, separate the implementation of the Circular Economy into micro, meso and macro levels in China: corporate level (micro), inter-firm level (meso), and societal level (macro). The macro-level interprets the practice of the Circular Economy as a more complex and comprehensive plan at the provincial and prefectural level in China. China adopts the concept of the adoption of the Circular Economy to stimulate cleaner production, prevent pollution and control waste (Feng, Lam, 2021). According to Pintilie (2021), economic development is very clearly linked to energy supply, and despite energy demand reducing from one period to another, it is imperative to ensure the transition to green energy in order to increase the share of renewable energy in the total energy supply.

Hussein and Hamdan (2020) state that fiscal policy can be more efficient by using its financial tools to encourage projects in the Circular Economy and the reduction of pollution, then there will be more chances to achieve sustainable development. According to the authors, fiscal tools can provide a stimulus for producers as well as consumers to change their behaviour towards a more eco-efficient use of natural resources. Prieto-Sandoval *et al.* (2021) conducted a study that confirmed the importance of creating value through business model innovation in the Circular Economy framework, and suggest that firms that belong to the linear paradigm should rethink their business models to create value for the environment and society. Hussein and Hamdan (2020) state that fiscal tools can provide stimulation for technological innovation and reduce consumption levels. Policy makers or international institutions are pushing for a radical change of the production model, from a linear 'take, make, dispose' unidirectional model of production where natural resources provide input for creating mass products to be consumed and disposed after use, to a Circular Economy model of production, where economic growth is enhanced by virgin resource consumption (Centobelli *et al.*, 2020). Hussein and Hamdan (2020) state that there are no real government programmes in Iraq that aim to stimulate Circular Economy projects, despite their great benefit at economic and social levels, as neither fiscal nor monetary policy have taken a real role in achieving this goal.

In the discussion provided about possible Chinese government action to support the Circular Economy, Feng and Lam (2021) state that the government could educate the general public more, by providing sufficient information via different channels to raise awareness of the concept and importance of the Circular Economy. Prieto-Sandoval *et al.* (2021) prepared a methodology that can help policy makers understand a firm's perspective, and remove barriers that may hinder the development of eco-innovation, sustainable business models, and firms' environmental awareness.

Feng and Lam (2021) discuss that 'due to the significance of the financial barrier, access to finance and suitable sources of funding is crucial for SMEs to improve their sustainability performance.' And it also has to be borne in mind that advanced technology in clean production and recycling could be essential for the reduction of waste disposal and pollution emissions, while the systematic information platform to all actors in the supply chain is also important to track the status of products for reverse logistics to manage end-of-life products efficiently (Feng, Lam, 2021).

So, as can be seen from discussions by economists from various countries, the importance of governments towards the implementation of the Circular Economy is very significant, and covers various topics like fiscal changes, possibilities of financing businesses, education, and the regulation of waste disposal and pollution emission.

3.4. The need for changes in business certification/standardisation

Possible changes in the business sector can emerge from government regulations that put pressure on businesses, forcing them to change at greater speed, as taxation can help them to either save possible waste or to earn profits. Another way to make businesses make faster changes can be the pleasure from consumers who might need new kinds of circular products or services.

Sassanelli *et al.* (2019) analyse the possibilities of a product certification system relating to the circularity of resource flows, internal reporting and benchmarking in companies, or support in the creation/enrichment of databases useful for Life Cycle Assessment.

As can be seen from variety of scientific discussions provided, the possible changes in business models in the conditions of a Circular Economy will bring changes to the economy, but at the same time it is still possible to plan and keep profitability and business cost efficiency.

Conclusions

According to the research results, the Circular Economy, as a new production and raw materials management philosophy, combines new scientific and industrial knowledge into an industrial symbiosis that will help to transfer the linear economy to a circular one, joining all the possible stages of production (take, make, distribute, consume and recover) into one circle.

The effect of the Circular Economy on a state's economy can appear through its effect on consumption, the flow of raw materials, and businesses (by creating new business models that could increase the motivation of businesses to start new production processes). Positive changes in government regulations can increase incentives and reveal the positive impact of the Circular Economy on ecology.

There comes a need to overview general business practices in various decisions, looking for solutions to implement the Circular Economy: creating new product life cycles that need industrial symbiosis and fewer raw materials; a review of recycling processes and possible changes in consumption habits that can appear from consumer education and changes to government regulations.

Recommendations

Accepting the Circular Economy into a state's economy and planning all economic activities in a circular mode are seen as necessary and eventually achievable over time. To speed up its implementation, several recommendations can be prepared. First of all, consumers should be continuously educated about the importance of reducing their consumption of various products that have a short life cycle, and formulate a preference towards eco-friendly production, taking care of sorting the products they do not consume any more. Second, government regulations could encourage firms to turn to the Circular Economy: fiscal changes like additional taxation of non-circular production or tax relief for companies taking care of their production output circularity, and collecting used products for future repairs or for remanufacturing.

As the business sector reflects consumers' needs, and government regulations that might help them become more motivated to move towards changing their business towards the Circular Economy, a need that could be projected for them is new possible business models and industrial symbiosis that might appear from various pieces of research.

The possible collaboration between governments, the business sector and science can not only make the Circular Economy necessary but also overcome change.

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ŽIEDINĖS EKONOMIKOS POVEIKIO VALSTYBĖS EKONOMIKAI TEORINĖ ANALIZĖ

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Santrauka

Žiedinės ekonomikos koncepcijos atsiradimas, anot C. Sassanelli's ir kt. (2019), susijęs su Ellen'os MacArthur 2005 metais inicijuoto judėjimo pradžia. Nuo tada žiedinę ekonomiką analizuoja daugybė autorių, į šį procesą įsitraukė ir verslo subjektai bei politikos formuotojai. Kaip teigia C. Sassanelli's ir kt. (2019), N. Pintilie (2021), publikacijų žiedinės ekonomikos tematika nuo 2015 metų vis gausėja, daugiausiai jų – iš Europos šalių (57,8 %), jas veja Kinijos mokslininkai. Nuo 2015 iki 2020 metų į pagrindinį leidinių srautą patenkančių straipsnių skaičiaus reikšmingas augimas rodo didėjančią susidomėjimą nagrinėjama tema.

Žaliąjį kursą priėmusi Europos Sąjunga savo dokumentuose (European Parliament resolution, 2021) vardija iššūkius, su kuriais susidurs šalys, miestai, įmonės ir asmenys, įgyvendindami pagrindines žiedinės ekonomikos koncepcijas. N. Pintilie (2021) atliktas tyrimas atskleidė, kad klimato pokyčiai lėmė būtinybę artimiausiu metu pereiti prie atsinaujinančios energijos. Norint paspartinti žiedinės ekonomikos plėtrą, svarbu keisti vartotojų ir gamintojų požiūrį į produkciją, jos vartojimą bei perdirbimą. Mokslininkų (Abokersh ir kt., 2021; Reddy, Kumar, 2020; Fengr, Lam, 2021) teigimu, būtina šviesti visuomenę, informuojant apie aplinkosaugos aspektus, kurie susiję su linijinės gamybos organizavimu įvairių šalių ekonomikose. Teigiamo žiedinės ekonomikos poveikio aplinkai pripažinimas gali būti nulemtas ir politikos formuotojų bei vyriausybių, keičiančių fiskalinę politiką, skatinančių įmones ieškoti žiedinių sprendimų komercinėje veikloje. P. Centobelli ir kt. (2020), S. A. Hussein'as, A. A. Hamdan'as (2020) ir kiti analizuoja vyriausybinių reglamentų pokyčių svarbą, Q. Li ir kt. (2019), R. Clift'as, A. Druckman (2015), M. Geissdoerfer'is ir kt. (2018) savo straipsniuose aptaria naujų verslo modelių kūrimo būtinybę bei versle jau taikomus žiedinius metodus.

Darbe analizuojama mokslinė problema – nustatyti, kaip žiedinės ekonomikos įgyvendinimas paveiks valstybių ekonomikas. Tyrimo objektas – žiedinės ekonomikos plėtra. Tyrimo tikslas – atlikti žiedinės ekonomikos poveikio valstybės ekonomikai teorinę analizę. Tyrimo uždaviniai: 1) atskleisti žiedinės ekonomikos sampratos esmę; 2) nustatyti galimas žiedinės ekonomikos poveikio valstybės ekonomikai kryptis. Tyrimo metodai: mokslinės literatūros analizė, palyginimas, apibendrinimas.

Apibendrinant mokslinę diskusiją dėl žiedinės ekonomikos sampratos galima teigti, kad tai naujas požiūris į ekonomiką ir verslą, apimantis kitą požiūrį į vartojimą, gamybos technologijas, medžiagų atkūrimą žiediniu būdu. Žiedinė ekonomika, kaip nauja gamybos ir žaliavų valdymo filosofija, susieja naujas mokslo ir pramonės žinias į pramoninę simbiozę, kuri leis linijinę ekonomiką perkelti į žiedinę, susiejančią visus galimus gamybos etapus (imti, gaminti, platinti, vartoti ir susigrąžinti) į vieną veiksmų žiedą.

Žiedinės ekonomikos poveikis valstybės ekonomikai gali pasireikšti per poveikį vartojimui, žaliavų srautams, verslui (kuriant naujus verslo modelius, kurie galėtų motyvuoti verslininkus pradėti naujus gamybos procesus). Teigiami valdžios reguliavimo pokyčiai gali skatinti ir atskleisti teigiamą žiedinės ekonomikos poveikį ekosistemai.

PAGRINDINIAI ŽODŽIAI: *žiedinė ekonomika, žiediniai verslo modeliai, poveikio analizė.*

JEL KLASIFIKACIJA: E66, O11, O44, H0.

Received: 2022-04-10

Revised: 2022-05-09

Accepted: 2022-05-20