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CIRCULAR ECONOMY FROM COMPANIES AND CONSUMERS PERSPECTIVES: TOWARD VALUE CO-CREATION

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ABSTRACT: The paper aims to confront consumers' and businesses' perspectives on the circular economy (CE) R-strategies and to indicate the level of their implementation in value co-creation. The study is based on empirical studies conducted among companies and consumers in Poland in 2022 and 2023. The statistical data analysis examines the frequency of indications to assess the respondents' taking of certain actions or perceptions of the issues involved. The results indicate the initial stage of implementing the R-strategies among both groups. This demonstrates the continued need for their dissemination. Moreover, the results reveal that the actions taken by companies and consumers are only partially in line. Despite its great potential, the value of the co-creation process seems underestimated. The CE transition requires reconfiguring the activities carried out in companies in the offered value proposition, carrying out the company's processes and relations with external stakeholders, organising business architecture and its environment, and adjusting the company's individual functions and activities. However, before all, the companies must include consumers in planning R-strategies.

KEYWORDS: circular economy, CE transition, R-strategies, value co-creation, consumer value co-creation

Introduction

Business management aims to achieve economic results, i.e., specific results, by providing consumers with the solutions they need at a price they are ready to pay. Management is only effective if it brings the aforementioned economic results and strives to improve or increase the efficiency of available resources, improving the entity's profitability (Drucker, 1973). The need for sustainable development is also indicated in modern management, which considers social and ecological aspects when implementing the company's economic goals (Adamczyk & Nitkiewicz, 2007; Roszkowska, 2011). In addition, the literature on the subject also distinguishes market effects from the economic impact of the enterprise. For example, Gay and Wensley (1988) state that among an enterprise's most important market effects are consumer satisfaction, loyalty, and market share, while economic effects include profit, profitability, and return on invested capital. The differentiation between these two examples of contemporary directions of development of enterprise management shows the role of external factors as essential parameters for strategic activities and, therefore, the way of creating value. In addition, "the development of low-carbon, resource-efficient and competitive economy also depends on the increase in public awareness of the required changes in production and consumption patterns" (Wojtach, 2016).

Thus, the significant task of contemporary strategic management is to look for sources of value and to achieve above-average firm performance (Dyduch, 2022). Moreover, entrepreneurial strategy is seen as handling relations between an organisation and its environment, where resources and actions are committed to sense and seize opportunities effectively.

Sustainable development started being on the entrepreneurial agenda for over two decades. Sustainable corporate performance refers to expanding business performance indicators covering financial and non-financial aspects instead of traditional financially focused approaches (Jha & Rangarajan, 2020). It, therefore, refers to the growth of the customer base, market share and financial outcomes, and it outlines improvements in environmental, social, operational and competitive performance (Le, 2023).

However, even if indicated at the strategical level of the company, it seldom might be seen at the operational level where the declarations meet practical solutions proceeded in the form of "business-as-usual". Even if implemented, they are usually created based on internal experiences and know-how and are driven mainly by an economic perspective (Rutkowski, 2009). Such solutions, while being a good start, seem insufficient because we still face negative climate changes and postulates of Agenda 2030, the European Green Deal and many other vital documents assumptions are seriously threatened.

Circular Economy (CE) is defined as an economic system where waste is managed rather than discarded immediately; such waste is seen as an input resource for other processes (Nattassha et al., 2020). CE is known to be highly associated with sustainability as it facilitates the reduction of resource consumption and waste during the production process. It encourages the integration of economic activities, as well as environmental considerations and social well-being into business activities to improve operational efficiency to balance values in terms of economy, society and environment (Alcalde-Calonge et al., 2024; Van Opstal et al., 2024; Le, 2023; Lopes de Sousa Jabbour et al., 2019; Teixeira et al., 2016).

The new promise, in terms of practical hindered progress of business negative impact on the natural environment, is the CE values implemented on strategic and operational levels. The fundamental principles that create values in the CE are (Ellen MacArthur Foundation, 2013; Mendoza et al., 2017):

- elimination of waste generation in the production and consumption processes,
- selection of technologies and processes that use only renewable or highly efficient resources,
- optimisation of raw materials by keeping products and components in circulation,
- developing system performance by identifying and removing negative externalities.

"Shifting to a more circular and resource-effective economy will require more widespread penetration of circular business models" (Bartoszczuk, 2023). The new CE business models developed under so-called R-strategies bring a broad range of propositions for effectively reducing external costs (Nowicka, 2022). However, if those solutions are supposed to be ecologically and economically sufficient, they should be co-created with the main stakeholder – the consumer, as the consumers'

DOI: 10.34659/eis.2024.90.3.788

needs and expectations are driving business. Consumers can develop actions aimed at interacting, participating with, and suggesting ideas to firms to enhance the company's products or services (Orcik et al., 2013). Additionally, value's meaning and value creation process rapidly shifted from a product and firm-centric view to a personalised consumer experience (Prahalad & Ramaswamy, 2004). Tynan et al. (2010) defined co-creation as a process of value creation based on exchanging knowledge and skills between the consumers and the company to build successful experiences between them.

Even if the role of the consumer is identified as crucial for business, it has not been recognised widely in terms of whether companies include consumers' behaviour in terms of CE values and how it might impact their further value co-creation (Sairanen et al., 2024; Marques & Manzanares, 2023; Marques, 2022; Leder et al., 2020; Prieto-Sandoval et al., 2019).

Therefore, the paper aims to confront businesses' and consumers' perspectives on the requirements of CE R-strategies and indicate the level of their implementation in light of further value co-creation.

Additionally, in light of the identified literature gap, the following research questions are developed:

- What circular solutions are companies implementing, and which R-strategies are dominant?
- What stimulants and barriers do companies encounter in the CE transition? How do they perceive consumer attitudes?
- How do consumers adapt to CE requirements, and what actions fit into R-strategies do they use?
- What are the stimulants of consumers' longer product use?
- Do companies' and consumers' CE actions converge? Does the value co-creation take place?

The first part of the paper is based on the literature review on CE, R-strategies and circular business models. The second part is based on empirical studies conducted among companies and consumers in Poland in 2022 and 2023.

From the theoretical perspective, the paper contributes to the development of knowledge mainly in the institutional, resource-based view (RBV), dynamic capabilities, and stakeholder theories.

An overview of the literature

Circular Economy, R-strategies and circular business model

The CE is a resilient economic system that creates value in the present and is sustainable and secure in the future. It is an example of a system that can create value by maintaining and improving social, economic, and health aspects. In its ideal model, all materials are continuously recycled without waste or waste. It is based on six sustainable areas: materials, energy, water, society, health and well-being. This means that recycled materials must not harm people or the environment, and economic prosperity is part of it (Zhu et al., 2010).

The CE is characterised by a set of values underlying the development of R-strategies and building business models in this system. Among these values, the following can be identified (Ripanti & Tjahjono, 2019; Ellen MacArthur Foundation, 2013): systemic thinking; circularity; innovations; resilience; cascading orientation; eliminating waste; technologies usage; ensuring long-term solution; compliance with regulations; economic optimisation; the value of the products; avoiding the loss; a network of partners; transition to renewable energy; environmental awareness.

Combining these elements refocuses the design of developing strategies and business models from appealing to consumer behaviour and personal ethics as a way of achieving positive change to designing eco-restorative models of production and consumption. Thus, this is more engaging consumers than attempting to persuade individuals to buy fewer or less polluting products (Pitt & Heinemeyer, 2015).

The CE is a model of production and consumption designed to extend a product's life cycle. Transformation towards the CE requires action at all stages of the product life cycle, i.e., from their design through the acquisition of raw materials, processing, production, consumption, and waste collection to their management in a varied way.

According to the model developed by the Ellen MacArthur Foundation (2013) that identifies technical (and biological) cycles related to the organisation of flows, the following actions enable the

DOI: 10.34659/eis.2024.90.3.788

transformation towards the CE: regeneration, sharing, optimisation, closing loops, virtualisation, and exchange.

Based on the above, companies can develop R-strategies. Assuming that "a strategy is a comprehensive plan for accomplishing an organisation's goals. Strategic management, in turn, is a way of approaching business opportunities and challenges—it is a comprehensive and ongoing management process aimed at formulating and implementing effective strategies. Finally, effective strategies are those that promote a superior alignment between the organisation and its environment and the achievement of strategic goals" (Griffin, 2013); the following R-strategy definition can be proposed: *R-strategy is a comprehensive plan for accomplishing an organisation's sustainable goals focused on extending a products' life cycles.*

"In the decline stage, demand for the product or technology decreases, the number of organisations producing the product drops, and total sales drop. Demand often declines because all those interested in purchasing a particular product have already done so. Organisations that fail to anticipate the decline stage in earlier life cycle stages may leave business. Those that differentiate their product, keep their costs low, or develop new products or services may do well during this stage" (Griffin, 2013). In light of CE goals, not only the introduction stage but also the pre-introduction stage is crucial for economic success. This pre-introduction stage consists of designing the product in terms of its further re-sale and re-profit limiting decline stage.

Further development of closing loops offers several R-strategies indicated in Table 1, where the arrow illustrates the increase in circularity.

Table 1. The R-strategies Framework

Direction of the transformation	Main characteristics	R-Strategies	Concept of the R-strategy
Circular Economy ↑ Linear Economy	Smarter product use and manufacture	R0 Refuse	Make the product redundant by abandoning its function or offering the same function with a radically different product.
		R1 Rethink	Make product use more intensive (e.g., by sharing product).
		R2 Reduce	Increase product manufacture or use efficiency by consuming fewer natural resources and materials.
	Extend the life span of the product and its parts	R3 Reuse	Reuse by another consumer of a discarded product which is still in good condition and fulfils its original function
		R4 Repair	Repair and maintenance of defective product so it can be used with its original function.
		R5 Refurbish	Restore an old product and bring it up to date.
		R6 Remanufacture	Use parts of discarded products in a new product with the same function.
		R7 Repurpose	Use discarded products or parts in a new product with a different function.
	Useful application of materials	R8 Recycle	Use materials to obtain the same (high grade) or lower (low grade) quality.
		R9 Recover	Incineration of material with energy recovery.

Source: authors' work based on Kirchherr et al. (2017).

According to Griffin (1996), "a well-designed strategy focuses on four basic factors: 1) the scope of the strategy – the set of markets in which the organisation will compete; 2) resource distribution – the way the organisation allocates its resources among different uses; 3) distinctive competence – what the organisation does particularly well; and 4) synergy – how the different areas of the company's activities complement or support each other". This means that R-strategies should be developed with a systemic approach, considering the holistic, long-term perspective of the company's further development. This situation often means revising the current sales markets, supplies, competition and the potential for developing the company's strengths in new legal, environmental or technological conditions of CE.

DOI: 10.34659/eis.2024.90.3.788

The CE business model describes an organisation's value to consumers by illustrating the capabilities and resources needed to re-create, bring to market and deliver that value (Trott, 2017). This value results from the need to eliminate waste and strives to extend the life cycle of products. The value delivered in the process of extending the life cycle of products may differ from the original (Nowicka, 2022). Ostrom (2010, 2014) points out that solving global problems, such as the fight against climate change, requires a polycentric approach and cooperation between public, private and individual actors at various levels. One of the main stakeholders of the CE is the consumer, who finally decides on extending the product life cycle and how it is extended. In this light, it seems essential to cooperate closely with supply chain business partners and, most importantly, with the consumers, recognising their needs, ecological awareness, and readiness to rethink their behaviour as responsible consumers for successful R-strategies implementation.

Value co-creation with consumers for R-strategy development and implementation

Specific R-strategies impact the business model that "describes the rationale of how an organisation creates, delivers, and captures value" (Osterwalder & Pigneur, 2010; Teece, 2010). Value proposition refers to a company's products or services offered to a particular segment of consumers. It also includes a company's differentiation strategy. This could include, e.g., increasing price, cost, time efficiency, ease of use for consumers, or risk reduction (Teece, 2010).

The CE value proposition can include products that consist of biodegradable resources and enable prolonging their life cycle in cooperation with the consumer, e.g., by giving the possibilities for reusing, repurposing, or remanufacturing preliminary products. The value proposition in the CE is therefore created in light of the product's subsequent life cycles' development and flows. At the same time, it should include the consumer's behavioural perspective on those propositions as the consumer becomes an integrated partner in the circular supply chain business model. In the CE, a consumer decides what loop will be closed and how to choose when the preliminary value proposition is consumed. The possibility of reselling or sharing value propositions with others at the end of its life cycle can be a good differentiator impacting the company's competitiveness.

Value creation is indicated in the firm's organisation of processes and resources (Johnson et al., 2008) and includes factors related to the resource constructs that create value (Delmond et al., 2016). Additionally, core competencies such as architecture or organisational infrastructure are included in value creation (Osterwalder & Pigneur, 2010). A distinctive aspect of CE is that conceiving materials leakages and value creation loops can have different meanings for technical and biological materials. For technical materials, including metals, plastics and glass leakage, they refer to the loss of materials, labour and energy in products and components that cannot be reused, refurbished or recycled within closed or continuing loops. The point at which products and materials are recovered significantly affects the value creation possibilities. Recycling, for example, generally has lower value recovery than re-use or remanufacture (Guide, 2000), and it has been suggested that recycling should not be considered a closed loop (McDonough & Braungart, 2013). On the other hand, biological materials are consumable and are not used the same way as technical materials. Therefore, avoiding degradation, loss and degeneration of soils, ecosystem services, and natural capital is crucial to CE-led closed-loop practices (Mishra et al., 2018). Leakage in a bio cycle refers to the loss of opportunity to maximise the cascaded use period and the inability to return the nutrients into the soil due to contamination (Ellen McArthur Foundation, 2013).

Several vital challenges and building blocks of value creation from the CE-led closed loop can be distinguished by so-called building blocks (circular design, business model design, forward and reverse supply chain, and system enablers) (Mishra et al., 2018). Capabilities for successful circular design include material selection, standardised components, designed-to-last products, design for easy end-of-life sorting, separation or reuse of products and materials, and design-for-manufacturing criteria that consider possible valuable applications of by-products and wastes.

Capabilities for successful circular business model innovation include identifying value creation, value capture and value distribution for any given business context and demonstrating the superior business benefit compared to a base linear case. Many business model archetypes can be used as a starting point, e.g., service and performance-based, incentivised return, value-added services, etc. Capabilities for cascades and the final return of materials to the biosphere or back into the industrial production system include excellent customer service and supply chain processes, such as delivery

DOI: 10.34659/eis.2024.90.3.788

chain logistics, sorting, warehousing, and risk management, to achieve cost-efficient, better-quality collection and treatment systems, and effective segmentation of end-of-life products. In terms of system enablers, capabilities for identifying, anticipating and harnessing key enablers include new forms of partnerships and collaboration across the value chain, digital transformation, rethinking internal incentives, working with regulators and policymakers, having access to finance, building on existing systems and organisational characteristics (Mishra et al., 2018).

Value delivery describes the consumer segments that a company wants to attract and offer their values to. These segments could be, for example, mass markets, niche markets, segmented consumers or multi-sided platforms (Mikl et al., 2020). From the CE perspective, those segments are the consumers that care for pro-ecological solutions, are interested in Planet's future well-being and care for sustainable development. Those could also be consumers willing to change their behaviours as they raise their ecological awareness. Furthermore, value delivery implies the interaction between the firm and its consumers. In particular, it shows a company's links with its consumers, such as personal assistance, self-service, automated services or community engagement (Osterwalder & Pingneur, 2010).

Companies create and capture value by combining the resources they control with those owned or controlled by consumers, suppliers and end users (Song et al., 2016). Nowadays, consumers are gaining a voice due to increasing proactivity and increasingly want to become more involved with companies and provide them with feedback interaction (Tierney et al., 2016; Galvagno & Dalli, 2014). They are no longer passive audiences but active players for companies (Prahalad & Ramaswamy, 2000). Consumers can develop and suggest ideas to firms to enhance the company's value proposition (Orcik et al., 2013). As a consequence, the concept of value co-creation has become increasingly important and recognised as the contemporary evolution of value creation (Conduit & Chen, 2017; Vargo & Lusch, 2017) through interactive experiences and iterative processes which result in mutually beneficial outcomes for consumers and firms (Cambra-Fierro et al., 2018). Co-creation can be understood as "the process of creating something together in a process of direct interactions between two or more actors, where the actors' processes merge into one collaborative, dialogical process" (Grönroos & Gummerus, 2014). As a result, firms can engage consumers and co-create value with them (Cambra-Fierro et al., 2018). In this way, consumers are starting to play an active role in an open, innovation-oriented corporate strategy and are also involved in the co-creation process of value. This model's use is visible through corporate social responsibility practices or sustainable development. It is believed that co-creation activities may play a role in mediating the link between the company and the "green" purchasing behaviour of consumers (Liu et al., 2022).

Therefore, value creation and delivery in cooperation with consumers can be understood as value co-creation. This brings companies long-term profits based on consumer loyalty, which is an innovative method for value capture.

Research methods

The analysis is based on two empirical studies concerning companies and consumers in Poland.

The first survey was conducted in 2022 in randomly selected manufacturing companies (more on the research Nowicka, 2022). The focus on manufacturing companies resulted from the assumption that they know how to operate in line with sustainable development, thus showing potential for the CE transition. Companies qualified for the CATI survey had to declare the implementation of activities related to the reuse or processing of products to eliminate their waste. The interviewer briefly explained the concept of CE, ensuring respondents understood the topic properly. The representative for the Poland sample comprised 200 companies[1]. Respondents – companies' management – were, among others, asked to indicate the R-strategies both used in their company and planned for the future and to evaluate the stimulants and barriers encountered in the process of CE transition.

The second research, the CAWI survey, was conducted in 2023 among randomly selected consumers. The sample comprised 1000 respondents (who answered all questions in the survey) and was constructed to reflect the population in terms of gender, age, education, and habitation. This sample is representative for Poland. Respondents were asked to designate pro-environmental actions, identify how they purchase and use products from different sectors (thereby indicating how their

[1] During the canvass, 512 attempts were made to establish a telephone call, of which 200 resulted in an effective interview, and 59 were ineligible for the survey.

DOI: 10.34659/eis.2024.90.3.788

activities fit into specific R-strategies), and imply what would make them extend their use of the products owned. Since the concept of circular economy is poorly understood in society, the respondents were informed about the aims of the research in more general terms – outlining that it tries to identify the level of consumer awareness and their impact on the environment and recognise barriers and motivations for taking pro-environmental action. The questions were formulated not to include concepts potentially unfamiliar to the respondents.

Pilot studies did not antecede the surveys. However, they were based on an in-depth literature review and results of previous research in similar fields. Therefore, they should adequately capture the issues that have been investigated.

The statistical analysis focuses mainly on analysing the frequency of indications to assess the respondents' taking of certain actions or perceptions of the issues involved. Even this approach allows for vital conclusions.

By examining related issues within companies and consumers, the authors have a unique opportunity to confront the results and draw profound inferences on reconciling the actors' attitudes and support measures that combine business opportunities and consumer expectations. The strategies companies adopt do not coincide entirely with the actions available for consumers, so the specific actions of companies and consumers that fit into a particular R-strategy may differ. However, they are linked by the ultimate effect that R-strategies assume. Such a combined analysis allows us to assess the CE perspectives and levels of implementation in the Polish market. The value of co-creation was not directly explored in the surveys, but the topics covered by the research allow for the indirect capture. The analysis of companies' and consumers' actions and perceptions of some surveyed issues indicates how this concept is used in practice.

Results of the research

Results concerning companies

Company surveys examined different R-strategies regarding the assumptions adopted during product design. First, the respondents were asked to indicate the solutions implemented, mark the one dominant in their current business activities, and specify their interest in the future implementation of various solutions.

The responses' analysis of the dominant solutions shows that the R-strategy that comes to the fore is connected with products' future incineration with energy recovery (R9 Recover) — (Figure 1). This was followed by the R8 Recycle strategy, implying that the companies assume that the returned products will be reprocessed into new products with different functionalities.

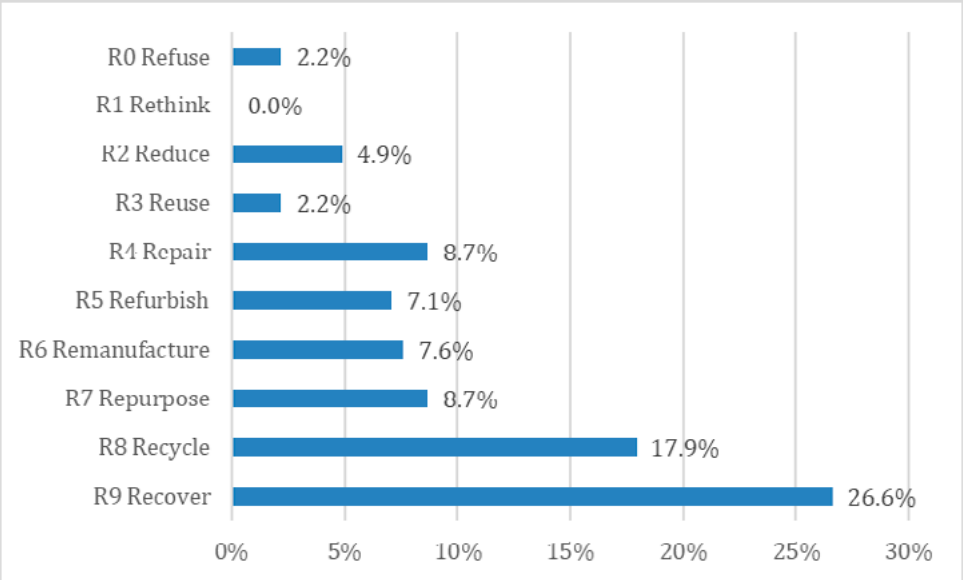

Figure 1. Dominant R-strategies [%]

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These R-strategies are also identified in linear flows and represent basic solutions that can only be further directed toward cycle-closing solutions. Besides, while perceiving the validity of recycling, one should be aware that even though it has a life-cycle extension effect, it does not always mean total waste elimination. Moreover, these solutions might have been applied even without the context of potential CE transition and would probably be developed regardless of the concept. Therefore, the results indicate that the surveyed companies are at an early stage of the CE transition.

Considering the context of the time, the respondents indicated solutions adopted in the distant and more recent past, as well as those they plan to implement in the coming year and within three years (Figure 2).

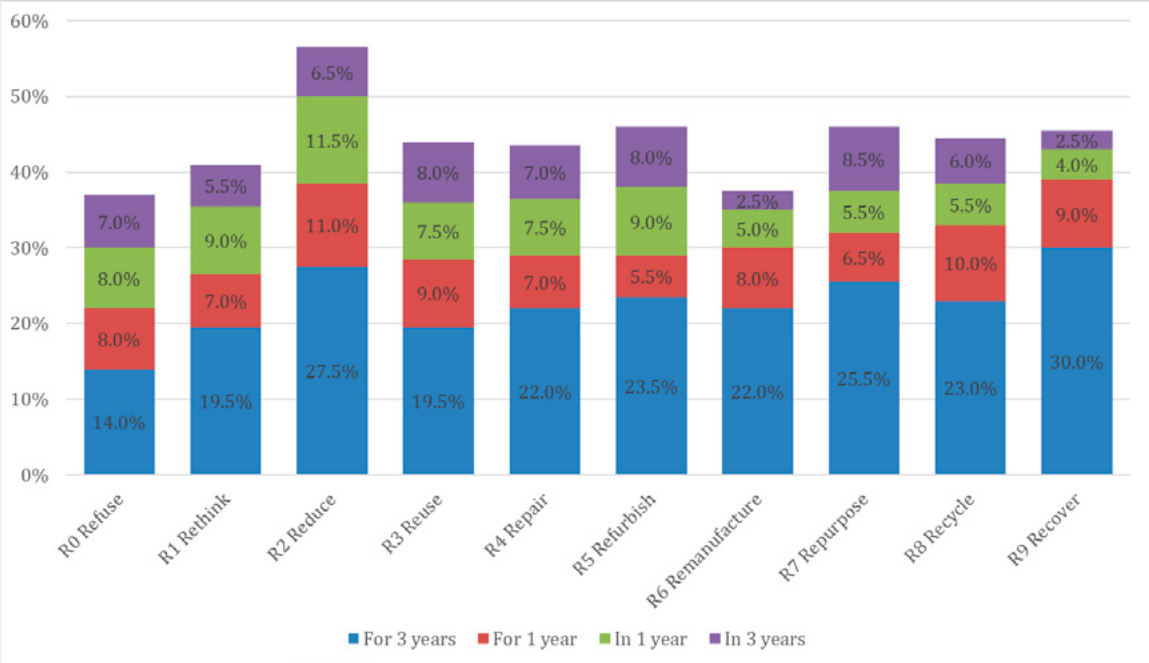

Figure 2. R-strategies used and planned for implementation

The R-strategies most frequently used for at least three years are R2 Reduce and R9 Recover, with the first strategy gaining importance in the last year compared to the Recover strategy. Redirecting implemented solutions toward increasing the production's efficiency or consumption while reducing the use of resources necessary for its production can be perceived as a positive development towards the CE transition. The R2 Reduce strategy was also indicated by the highest percentage of companies as the strategy scheduled for implementation in the coming year. There is also growing interest in R3 Reuse, R4 Repair, R5 Refurbish, and R7 Repurpose strategies, as most companies reveal plans for their implementation within the next three years. However, it is vital to be aware that the percentage of companies interested in their adoption is still low. An important observation from the study is an apparent withdrawal from implementing the R9 Recover strategy. Even the R0 Refuse strategy, implying developing companies' offers by adding new functionalities to the products already available without increasing their number, which has so far been the least implemented, is beginning to gain importance.

Nevertheless, it should be stressed that implementing all strategies is not widespread—even the most popular ones are now used by fewer than 40% of companies. If the declared plans are realised in 3 years, the use of the most popular strategies can be expected to exceed 40%, and only in the case of the R2 Reduce strategy is it likely to be higher than 50%.

Moreover, 50-60% of companies declare that they have not implemented the particular R-strategies or are planning to do so shortly (Figure 3). That rejection is mainly concerning the R0 Refuse and R6 Remanufacture strategies. Furthermore, companies disdain the R1 Rethink strategy, which implies encouraging consumers to increase the use of purchased products without the need to acquire new ones. Also, such important aspects as extending the products' life cycle strategies as R4 Repair or R6 Refurbish do not seem vital to companies.

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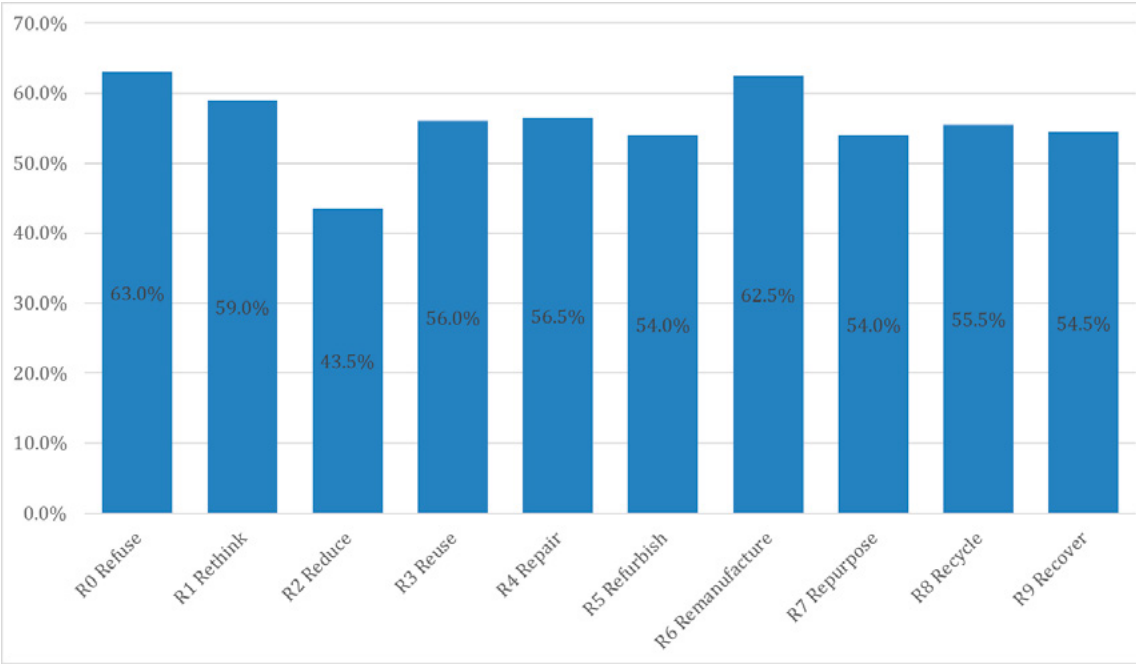

Figure 3. R-strategies not planned for implementation

Surprisingly, the surveyed companies indicate differentiated choices regarding the R-strategies, and their implementation path does not follow the model proposed by Kirchherr et al. (2017), as indicated in Table 1. Beyond this, their involvement in the CE remains low. The surveyed group is dominated by companies using single solutions, although the number of companies implementing several solutions is also not tiny. The results showing plans for the future are alarming – 68% of companies do not plan to implement any new CE solutions in the next three years. Only single companies are thinking of introducing a wide range of new solutions. This confirms a slow pace of further cycles' closing.

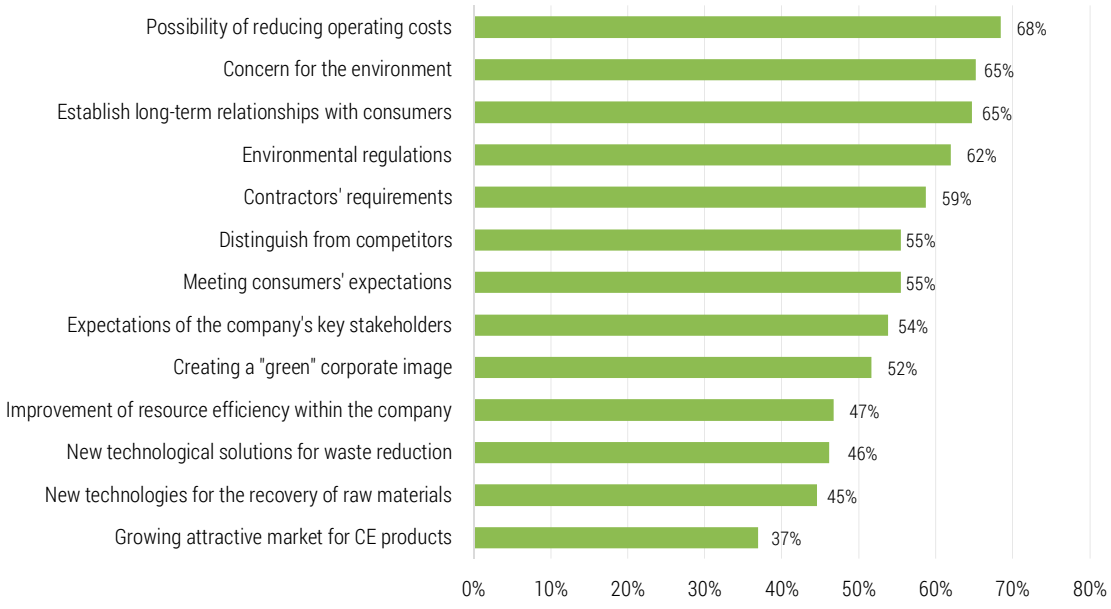

Figure 4. Stimulants of R-strategies implementation in the companies[2]

2 % of respondents evaluating the factor's impact on CE transition as important and very important.

DOI: 10.34659/eis.2024.90.3.788

Not all solutions fit every company's profile, and it is not easy to expect all companies to implement everything. However, there is undoubtedly much potential for further action. Such results may indicate that the stimulants for transition act too weakly or that a particular barrier to CE has been encountered. Companies have already taken some actions, but many have no further plans in this area. It is also conceivable that companies are not fully aware of the benefits and underestimate the potential of CE in value creation.

Therefore, the respondents were asked to indicate the stimulants and barriers encountered in the CE transition (Figure 4). Identifying these factors is very important from the value creation perspective.

The respondents seem aware of the need to implement green solutions and cite environmental concerns as the most important motivating factor. They are encouraged by the opportunity to reduce operating costs. They also recognise the need to adapt to environmental regulations. However, they are also willing to use CE to differentiate on the market, establish long-term consumer relationships, respond to stakeholder expectations, and meet market demand. These factors were indicated more often than standard organisational and management factors related to improving resource efficiency or the increasing market availability of new CE solutions. They also do not recognise barriers in this field as very important. Instead, the barriers in the area of regulation seem to be more essential (Figure 5).

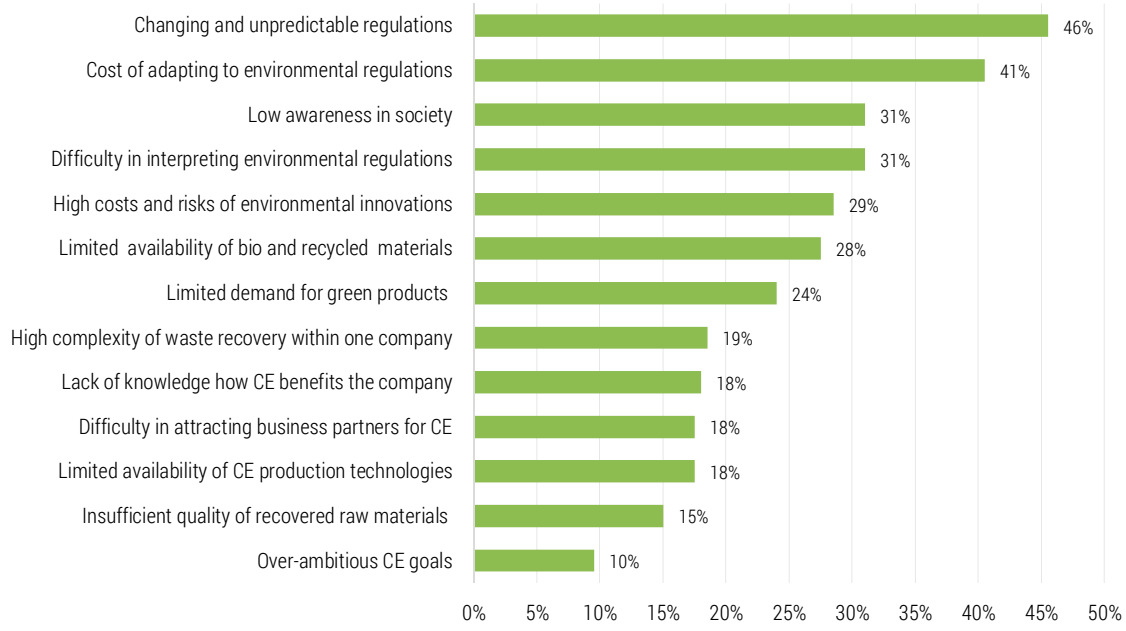

Figure 5. Barriers to the R-strategies implementation in the companies

Figure 5. Barriers to the R-strategies implementation in the companies

Remarkably, respondents do not perceive CE goals as over-ambitious and do not admit a lack of knowledge about CE benefits. Summarising, the companies declared a relatively positive disposition toward the transition.

What is striking in the results – respondents declare not meeting the adequate demand for green products. They present consumer attitudes as a factor slowing the transition – companies claim to be discouraged by the low demand for green products and do not feel 'rewarded' on the market. Moreover, they indicate the low awareness in society as one of the most important factors limiting the transition. The consumer's participation in this process is often cited as one of the most critical missing links (e.g. Fundacja Circular Poland, 2021).

DOI: 10.34659/eis.2024.90.3.788

Results concerning consumers

As the CE requires widespread social support, it seems crucial to confront the above results with consumers' perspectives. Consumers remain the products' owners, and their motivation to extend their life cycles is central to the transition and value co-creation (Stahel, 2019). Therefore, the next step of our research was to investigate how consumers adapt to CE requirements.

Respondents were asked to indicate how they purchase and use products from three sectors: household goods, electronics and clothing. The options for CE transition in such industries are also analysed by the Ellen MacArthur Foundation (2013).

The actions listed in the survey fit into specific R-strategies (Figure 6). As the questions were designed to be clearly understood by respondents, the strategies R5 Refurbish and R6 Remanufacture were not included in the survey, as it is difficult to formulate questions that can capture the essence of all strategies without detailed explanations of the differences between them. In order to avoid such confusion, the potentially best-understood strategies, which differ from each other, have been investigated.

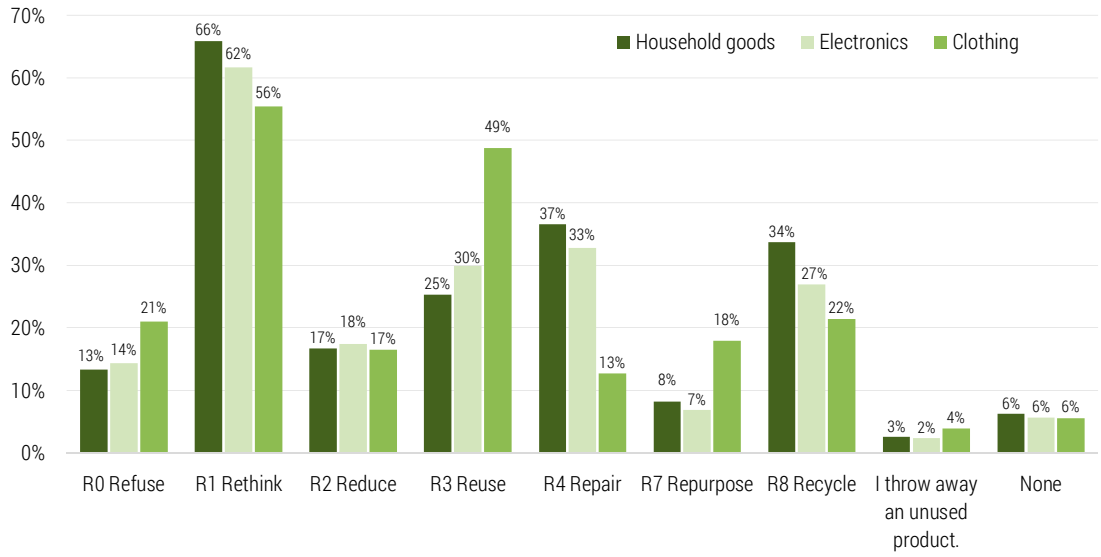

Figure 6. R-strategies used by consumers

The results for household goods and electronics look similar, while there is a slight difference in the case of clothing. It is striking that consumers explicitly declare the R1 Rethink strategy as the most common. This implies that they attach importance to making full use of their products. Remarkably, that strategy was the least popular among companies and the one most of them declared not to be planned for implementation. Furthermore, especially in clothing, the R3 Reuse strategy is frequently applied – passing on a used product to others also lengthens its life cycle. Such actions are used less commonly for electronics and household goods, though they are also undertaken. Respondents' everyday actions using household goods concern the R4 Repair and R8 Recycle strategy. Repairing and recycling of used products or their parts are also the case for electronics, while they are less evident for clothing (particularly Repair is one of the least frequent actions). Apart from the R1 Rethink and R3 Reuse strategies, consumers declare that while purchasing new clothes, they abandon it as unnecessary and remanufacture the product to make it usable for another application. The latter R7 Repurpose strategy is hardly used for household goods and electronics. The R2 Reduce strategy is one of the least used for all kinds of goods. Consumers are not inclined to check if the product has features that would reduce the need to buy new products.

Remarkably, consumers rarely discard unused products, and quite a few admit not taking action here. Some strategies may be more or less evident for different sectors, and again, it may be unlikely to expect the consumers to use all actions. However, apart from the evident use of the R1 Rethink strategy (declared by 55-66% of respondents), most strategies are rare. Undoubtedly, further dissemination of CE solutions is desirable.

DOI: 10.34659/eis.2024.90.3.788

Consumers' activities are linked to business activities and remain restricted or encouraged by market opportunities. Almost 80% of consumers complain that there is a lack of points where used products can be donated. 75% admit that repairing a product is too expensive, and only 36% perceive it as easily accessible and convenient. Such results are supported by other research, indicating that many consumers would prefer repairing their products to buying new ones. However, high costs and low availability are predominant barriers (Stahel, 2019). Simultaneously, 87% of consumers believe companies deliberately manufacture low-priced and low-quality products to induce repeat purchases, and 90% claim that companies should be responsible for recycling their products. Some distrust toward companies is also visible in other research – consumers often suggest that products made nowadays are deliberately not "built to last" (European Commission, 2018). Besides, many consumers "do not trust companies to be honest about their environmental impact" (Mintel Consulting, 2022).

The respondents were also encouraged to explain what would make them extend using the products (Figure 7).

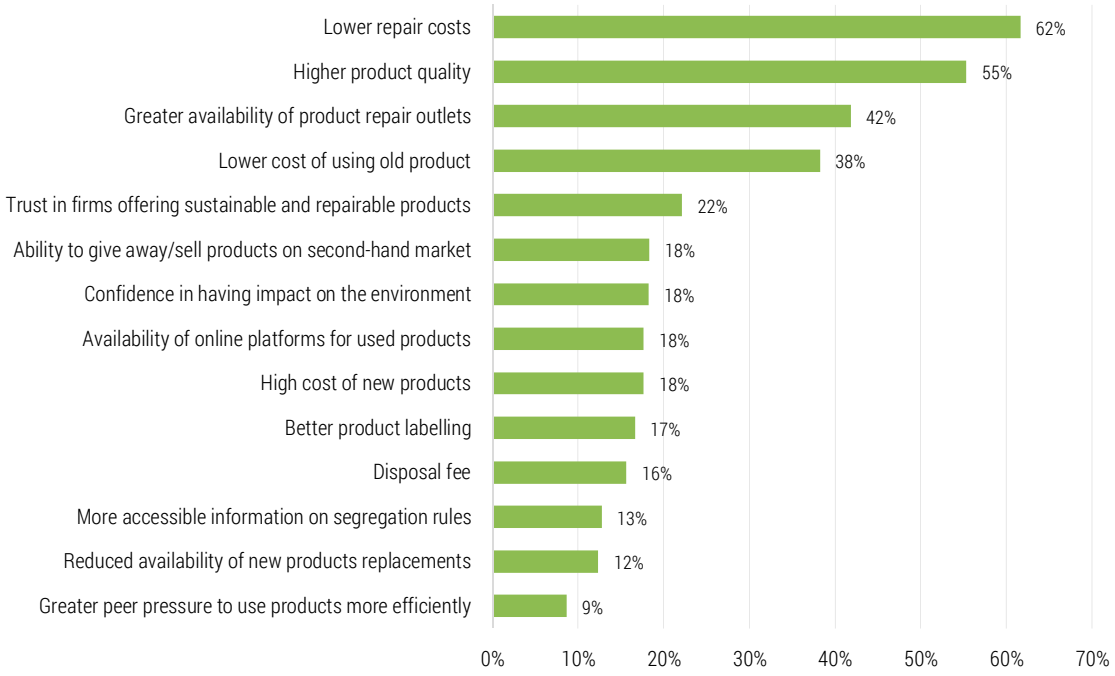

Figure 7. Stimulants of longer product use[3]

The most frequently cited factors are lower repair costs, higher product quality, greater availability of product repair outlets, and lower cost of using old products. Other stimulants were chosen less commonly. Such results indicate that extending the products' life cycle is possible. Potential for dissemination could be R1 Rethink, R4 Repair, or even R7 Repurpose strategies. Consumers expect increased quality of purchased products and more cost-effective and convenient repair. However, as described above, they poorly assess available repair options. This is confirmed by the inferences of the survey results concerning the companies – such strategies are not prevalent.

Another important factor is higher trust in companies offering sustainable and repairable products. This seems challenging when combined with the above-noted result, indicating that consumers believe companies deliberately manufacture low-priced and low-quality products to induce repeat purchases.

3 Respondents were asked to indicate the 5 most important factors.

DOI: 10.34659/eis.2024.90.3.788

Discussion

The companies surveyed are not focused on implementing CE and do not seem to perceive it as a crucial source of value creation. A growing interest in the more advanced R-strategies can be observed; however, it cannot be perceived as a breakthrough. Also, the plans for the future do not allow us to expect quick changes. Taking care of closing the cycle and intensive use of the R-strategies are also rare among consumers. Besides, they do not view the opportunities on the market favourably and appear to be distrustful of companies' actions. Neither party seems firmly committed to closing the cycles.

Our results are unique as the available research focuses on one type of actor, i.e., companies, consumers, or governments, and their actions. However, support can be found for partial results in available studies and reports (they are mainly restricted to Poland to maintain better results comparability and avoid the problem of differing conditions and market specificity). They also indicate the initial stage of CE development in Poland both at the level of the economy (Circle Economy, 2022; Eurostat, 2021; Instytut Gospodarki o Obiegu Zamkniętym, 2017), in companies (Fundacja Circular Poland, 2021; PARP, 2020), and among consumers (Fundacja Circular Poland, 2021; Forum Odpowiedzialnego Biznesu, 2019; Kantar, 2022; Mobile Institute, 2021).

The findings are distinctive as they allow for the confrontation between the approaches of surveyed companies and consumers. It indicates a need for convergence. The strategy most commonly used by consumers is R1 Rethink. Therefore, they declare willingness to use their products until they are fully utilised. However, the companies are reluctant to implement analogous actions and encourage consumers to increase the use of already purchased products instead of buying new ones. Meanwhile, supporting such activities can also be seen as a source of value creation, though arguably other than traditional. The R1 Rethink strategy could be combined with rarely used ones such as R4 Repair, R5 Refurbish, R6 Remanufacture and R7 Repurpose. The sources of value creation can be found, e.g., in the reconfiguration of sales and after-sales service. Consumers are willing to repair their products and extend their life cycles, but they perceive this process as complex. This requires changes in both parties' approaches. After the crisis of the 1930s, companies began to seek profits in increased sales and shortened life cycles of products that were not to be repaired. Consumers, in turn, were persuaded that it was always better to purchase more goods, that new products were better than their predecessors, and that repairing them was a highly specialised service (Webster, 2017). CE breaks with such practices, but its success implies developing new ones. Creating a sustainable economic system requires a shift in values and incentives (Hunter Lovins et al., 2018). Therefore, it is worth emphasising the need to develop standard ways of implementing the R-strategies.

Consumers declare readiness to pass the used products on to others (R3 Reuse). This requires developing possibilities to find other consumers interested in the continued use of such products. Companies could mediate in this process or collect the products for possible processing (with different R-strategies) and re-sale them.

Consumers are also not accustomed to finding new functionalities in their products. They rarely admit to checking if the owned products have features that would reduce the need to buy new products (R2 Reduce) and remanufacture the products to make them usable for another application (R7 Repurpose). The latter strategy could become more familiar with companies' support. However, at this point, companies rarely assume that the returned products will be reprocessed into ones with different functionality.

The actions surveyed companies and consumers take are not entirely in line, which does not facilitate the transition. Such divergence of activities and expectations of the actors involved may be one of the reasons for the slow cycle's closing and insufficient extension of products' life cycles. Moreover, despite its great potential, the value of the co-creation process seems to be underestimated. Companies appear to miss, to some extent, the opportunity to engage consumers in circular transition and fail to co-create value with them. They have not developed the cooperation necessary in this field. Neither companies perceive their consumers as partners willing to change their behaviours and support CE, nor do consumers value companies as credible when creating long-lasting, repairable products or enabling life extension services.

Even if the paper aimed to confront businesses' and consumers' perspectives on the CE R-strategies in light of further value co-creation, it has some shortcomings. It is challenging to investigate

DOI: 10.34659/eis.2024.90.3.788

circularity among two different groups of respondents and compare the results. Noticeably, it is advisable to improve the construction of future surveys to capture variables, allowing for better confrontation of different groups of respondents. The methodology to study the behaviour of companies and consumers in pro-environmental actions simultaneously, including circularity, should be developed. This would also help to deepen the analysis of value co-creation. At this stage, an attempt has been made to conduct a basic analysis of the data (mainly the frequency of responses) and to draw conclusions about the actions of companies and consumers. Undoubtedly, further analysis should be aimed at deepening the analysis and exploring causal relationships between variables.

Conclusions

The theoretical implications of the analysis indicate that value co-creation is vital for circular transition, although it has not been widely recognised in the literature. In CE, value is captured by value co-creation in the process of value delivery, starting from planning and aiming to prolong the value life cycle by using different R-strategies in successive cycles.

Confronting the perspectives of businesses and consumers on CE transition allows for vital conclusions and managerial recommendations. Undoubtedly, the transformation requires reconfiguring the activities carried out so far in the companies, especially in offering a value proposition, changing the processes carried out within the company and in relations with external stakeholders, organising business architecture and its environment, and adjusting individual company functions and activities, i.e., marketing, logistics, sales, etc.

However, the consumer is the most critical partner that must be included in the implementation or, more importantly, the planning process of R-strategies. Accelerating transformation and effective value co-creation through R-strategy implementation requires specific actions. Our results indicate that attention should be drawn to developing cooperation between consumers and companies, allowing for putting the R-strategies into practice, disseminating both demand reduction strategies (R1 Rethink, R2 Reduce) and life cycle extending strategies (R3 Reuse, R4 Repair, R5 Refurbish, R6 Remanufacture, R7 Repurpose), and revising sources of value creation in practice. Referring to the last, the following example can be used – R1 Rethink strategy implies increased use of the already purchased products instead of new ones. It leads to a decrease in sales of new products. This could be compensated by increased value creation from other strategies (R4 Repair, R5 Refurbish, R6 Remanufacture, R7 Repurpose). That would require manufacturing durable, reparable products, recovering raw materials or parts from products, reconfiguring sales and after-sales service, ensuring the possibility of repairing the products conveniently and inexpensively, and developing a market for used products.

The cost-effectiveness of implementing the R-strategies must be noticed. The production of durable and functionality-rich products must be profitable for companies. The reduced sales of new products should be compensated for in other areas, and investments in R-strategies must bring benefits. If consumers are to pay for CE-compliant products and participate in value co-creation in this area, they must be rewarded with good, easy-to-use, and long-lasting products.

Suppose the companies are to accurately identify new sources of opportunities in CE and adjust their strategies for value creation. In that case, there is a clear need to adapt their activities to consumer expectations. They should implement more than the least sophisticated R-strategies for product incineration or recycling. Consumers declare willingness to use their products more intensively. Still, companies should create such opportunities. They can offer better quality, functionality-rich and repairable products manufactured by CE principles. However, using products more efficiently and for longer requires a change in approach both at the design stage and in the planning of the after-sales service. Extending the products' life cycle requires improving the possibility of repairing and expanding the second-hand product market. Recovery of used products so that they can be transformed into products of the same or lower quality, with the same or different functionality, is also needed. Greater cooperation with consumers could result in effective value co-creation by bringing companies long-term profits based on consumers' loyalty and maintaining the links while using the purchased products.

DOI: 10.34659/eis.2024.90.3.788

Even if, at this point, companies perceive consumers' environmental awareness as low and the demand for CE transition seems insufficient, they can involve consumers in this process and convince them to adopt new solutions. One should not forget the conclusions indicating consumers' low confidence in companies' environmental performance and disbelief in their drive to produce high-quality and repairable products. Effective value co-creation requires mutual trust.

The research results provide a good basis for further studies on consumers' roles and their impact on companies' strategic decisions, contributing to stakeholder, institutional, RBV, dynamic capabilities, and stakeholder theories that we believe could be further developed.

Acknowledgements

This research has been supported by a subsidy for the maintenance of research potential in 2022 at the Collegium of Business Administration, SGH Warsaw School of Economics (funding institution: Ministry of Education and Science) within the framework of project No. KNOP/S22:1.3. "Enterprise in the circular economy: organisational, institutional and technological approaches."

The contribution of the authors

Conceptualization, K.N. and K.B.; literature review, K.N. and K.B.; methodology, K.N. and K.B.; formal analysis, K.N. and K.B.; writing, K.N. and K.B.; conclusions and discussion, K.N. and K.B.

The authors have read and agreed to the published version of the manuscript.

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GOSPODARKA O OBIEGU ZAMKNIĘTYM Z PERSPEKTYWY FIRM I KONSUMENTÓW: W KIERUNKU WSPÓŁTWORZENIA WARTOŚCI

STRESZCZENIE: Artykuł ma na celu konfrontację perspektyw konsumentów i przedsiębiorstw dotyczących R-strategii gospodarki o obiegu zamkniętym (GOZ) oraz wskazanie poziomu ich wdrożenia we współtworzeniu wartości. Analizę oparto o badania empiryczne przeprowadzone wśród firm i konsumentów w Polsce w latach 2022 i 2023. W analizie danych statystycznych zbadano częstotliwość wskazań w celu oceny podejmowania przez respondentów określonych działań lub postrzegania związanych z nimi kwestii. Wyniki wskazują na początkowy etap wdrażania R-strategii w obu grupach. Świadczy to o ciągłej potrzebie upowszechniania tych rozwiązań. Ponadto, wyniki pokazują, że działania podejmowane przez firmy i konsumentów są tylko częściowo zbieżne. Mimo dużego potencjału proces współtworzenia wartości wydaje się wciąż niedoceniany. Transformacja w kierunku GOZ wymaga rekonfiguracji działań prowadzonych w firmach w ramach oferowanej propozycji wartości, rekonfiguracji procesów wewnątrz firmy oraz w relacjach z interesariuszami zewnętrznymi; dostosowania architektury biznesu i jego otoczenia, a także dostosowania poszczególnych funkcji przedsiębiorstw i ich działalności. Jednak przede wszystkim firmy muszą włączać konsumentów w planowanie R-strategii.

SŁOWA KLUCZOWE: gospodarka o obiegu zamkniętym, transformacja GOZ, R-strategie, współtworzenie wartości, współtworzenie wartości z konsumentami

DOI: 10.34659/eis.2024.90.3.788