

THE RELATIONSHIP BETWEEN THE CIRCULAR ECONOMY AND BUSINESS PERFORMANCE: A SYSTEMATIC LITERATURE REVIEW

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Article History:

- received 15 November 2023
- accepted 21 March 2024

Abstract. The circular economy represents an effective way to address limited resources and mitigate the impact of human activity on the planet. To summarize the possible effect of circular economy implementation on business performance and its possible measurement, a systematic literature review on a final sample of 28 papers was conducted. The main findings reveal that the circular economy can help to improve business performance and that numerous indicators could be used to measure it, especially the balanced scorecard approach, which seems suitable for such classification (however, more research on this topic is needed). Additionally, it was revealed that the circular economy concept itself has no clear and generally used definition, which complicates the summarizing of the revealed indicators. To simplify future research, we proposed a research framework based on this systematic literature review and emphasized the research gaps.

Keywords: business performance, balanced scorecard, circular economy, indicators, sustainable, systematic literature review.

JEL Classification: M21, Q51.

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1. Introduction

The current economy is, to some extent, based on the concept of the linear economy, which is characterised by converting natural resources into products that are in the end changed into waste (Murray et al., 2017). Today, there is a common awareness that resources are limited and that businesses must transform production in a way when it is possible to balance the relationship between economic growth and ecological systems, thus creating self-sustaining production systems (Genovese et al., 2017). This can be done by changing the economic concept from linear to circular. In the concept of circular economy (CE), attention is especially paid to keeping the materials and products in productive use for as long as possible and to cycling their components effectively at the end of their use (Lacy et al., 2020). Eventually, the enterprises' environment should change to allow us to achieve a "prosperous, modern, competitive, and climate-neutral economy" (García-Quevedo et al., 2020, p. 2460), whose ultimate goal is to eliminate the concept of waste (Lacy et al., 2020). As the changes in the business environment are happening very fast, firms have to respond quickly (Januska & Chodur, 2009) and need to know the benefits of CE practice implementation to consider its

implementation. As environmental benefits are already well-known, economic are not so often promoted, although, e.g. European Parliament (2023) highlights the economic benefits of CE, such as increasing competitiveness, stimulating innovations, promoting economic growth, and creating circa 700,000 jobs by 2030.

This led the authors of this paper to study the economic effect of CE implementation in businesses (and thus, study the microeconomic level of the CE; for more information about CE levels, see (Gamidullaeva et al., 2022, p. 7)). Specifically, we study the relationship between CE implementation and business performance.

Starting with literature reviews is a good way to determine the current state of the art in the field; however, regarding this topic, only a few literature reviews were found (Atif et al., 2021; Gonçalves et al., 2022; Kanzari et al., 2022) and those were related only to the influence of CE implementation on financial performance. While attention to financial indicators is important, each business has different objectives and thus monitors and assesses different performance indicators. This led the authors of this paper to pay attention not only to the financial impacts of the CE implementation but also to the impacts of the CE on the other areas of business performance.

Thus, the research is conducted through a systematic literature review (SLR), and it aims to determine the current state of the art in the field of proving and measuring the impact of CE principles implementation on business performance. The research contributes to the literature on CE by systematically classifying the literature on CE's influence on business performance and its measurement into clusters (especially according to the types of performance). The research also provides a good theoretical base for researchers who plan to focus on the relationship between CE and some type of business performance and its possible measurement.

The paper follows with the definitions of CE in general, then the description of the SLR methodology (together with research questions). The resulting clusters of publications are presented next, with a discussion of their findings, followed by the conclusion.

2. Theoretical background

2.1. Circular economy

Although the historical roots of the circular economy go back to the 1960s, the CE concept is receiving attention mainly nowadays. Regarding history, the first mention of the concept was made by Boulding (1966), the concept itself was introduced by Stahel and Reday-Mulvey (1981), and elaborated by Pearce and Turner (1989).

The discussion about the correct definition of the CE concept is still ongoing today. Some authors apply the resource-oriented view and emphasize “the need to create closed loops of material flows and reduce the consumption of virgin resources and its attendant harmful environmental impacts” (Rizos et al., 2017, p. 4), while others pay attention to the difference between the linear economy and see CE as a “closed-loop system, just like a natural ecosystem” (Yu et al., 2022a, p. 1). Others define CE on the basis of CE practices, which are “green manufacturing (GM), recycling and remanufacturing (RR), and circular design (CD)” (Tang et al., 2022). Some apply the 3 pillars of sustainability and see CE as “the model based on economic, environmental and social dimensions [that] works as a closed-loop of resource movement from the primary extraction until the final consumption of the product” (Stankevičienė & Nikanorova, 2020, p. 531). Some are dealing with the relationship with the customer because the “firm is not just selling a service; it retains a formal explicit relationship through servicing the product” (Aboulamer, 2018, p. 767).

Additionally, on the basis of 114 definitions of CE by 2017, it is seen “as a combination of reduce, reuse and recycle activities”, with “few explicit linkages (...) to sustainable development”, and the main aim is economic prosperity, followed by environmental quality (Kirchherr et al., 2017, p. 221).

There are also some frequently cited definitions, such as (Ellen MacArthur Foundation, 2013, p. 7), which describes the CE 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 aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models”. Currently, the definition is shortened to “a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution” (Ellen MacArthur Foundation, n.d.).

Regarding the EU, the first definition was set by the European Commission and its CE package in 2015. The CE was defined as the economy where the “value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised” (European Commission, 2015).

Currently, the European Parliament defines the CE by an easily understandable definition as “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.” (European Parliament, 2023).

2.2. Business performance and its measures

Business performance is a concept that can be defined and measured in several ways (a comprehensive overview of the definitions can be found in Taouab and Issor (2019)). The reason for this dissimilarity can be apparent from Bolland’s (2017, p. 373) definition, who states that “business performance is what business performance systems measure”. In more detail, it can be defined as a business’s ability to achieve its goals (vision, mission, etc.) (Kennedy et al., 2020). Thus, as each business’s goals differ, it is evident that there will be several approaches to its measurement.

Classically, the business performance was measured mainly by using effectiveness (actual output/expected output) and efficiency (resource expected to be consumed/resources actually consumed) indicators, together with e. g. quality, productivity, innovations, profitability/budgetability indicators (Rolstadås, 1998).

In the ‘90s, this one-sided view led Kaplan and Norton (1996) to propose a balanced scorecard (BSC) methodology, where business performance can be measured from four perspectives (financial, customer, internal processes, learning and growth). The BSC methodology provides a comprehensive framework that translates the company’s strategy and vision into a comprehensive set of performance measures (Kaplan & Norton, 1996). As Cokins (2009, p. 103) states, “its primary purposes are to report the carefully selected measures that reflect the strategic intent of the executive team, and then enable ongoing understanding as to what should be done to align the organisation’s work and priorities to attain the executive team’s strategic objectives.” Thus, the main benefit of this methodology is that it focuses not only on the business’s financial results but also on how to achieve them (by measuring objectives in other perspectives).

Although the BSC was introduced more than 20 years ago, the predominance of financial measurement is still valid today. It was confirmed, for example, by extensive SLR on family business performance measurement made by Williams (2018), who stated that 84% of examined studies (published in peer-reviewed journals between 1980 and 2015) used solely financial data,

specifically indicators such as ROA, Sales, Profit, Tobins' Q, ROE, ROI and ROS were used. Also, our study confirms that the implementation of CE principles was examined more frequently in terms of its impact on business financial performance than other types of performance.

3. Methodology

A literature review can be done in two ways: traditionally and systematically (Ahmad et al., 2020; Tranfield et al., 2003). Both methods use methods such as summarizing, analysing and evaluating other authors' ideas; however, the traditional method is more subjective without clear criteria for paper selection and analyses of only a limited number of publications (Ahmad et al., 2020). These shortcomings are eliminated by SLR, which starts with the formulation of research questions to be answered by data from the studies included in the review. The studies included in the review are searched, identified, selected and critically appraised by using systematic and explicit methods (Cook et al., 1997; Moher et al., 2009). Additionally, the process is transparent and can be replicated, which should lead to minimalization of the researcher's bias (Tranfield et al., 2003).

The SLR methodology in this paper is based on Tomašević et al. (2021) and Baltazar et al. (2023). First, the research questions are stated Tomašević et al. (2021); then, keywords are defined, and the database is selected. Additionally, the type of searched documents and their language should be defined in advance (Baltazar et al., 2023). Then, the articles are sourced and screened for quality and relevance, and the final sample is thoroughly read (Tomašević et al., 2021).

To determine how well the existing research studies the effects of CE principles implementation on business performance and what indicators are used, the following research questions are stated:

- RQ1: According to the existing research, is there a relationship between the implementation of CE principles and business performance improvement?
- RQ2: According to the existing research, what indicators are used to measure business performance improvement due to the implementation of CE principles?
- RQ3: According to the existing research, can the BSC methodology be used to implement CE principles and manage the performance?

As shown in Table 1, the Web of Science database was solely selected, as it represents a quality database often used in SLRs (e. g. by Baltazar et al., 2023; Tomašević et al., 2021), and by using a single database, there will be no redundancy of found publications.

Table 1. Article sourcing protocol (source: own elaboration, 2023)

Database	Web of Science
Article type	No restriction
Article language	English
Year of publication	No restriction
Search field	Topic (title, abstract, author keywords, and KeyWords Plus)
Combination of keywords	"Circular economy" AND ("business performance" OR "enterprise performance" OR "financial performance") "Circular economy" AND ("business performance" OR "enterprise performance") AND ("measurement" OR "measure") "Circular economy" AND "Balanced Scorecard"
Date of search	20. 2. 2023

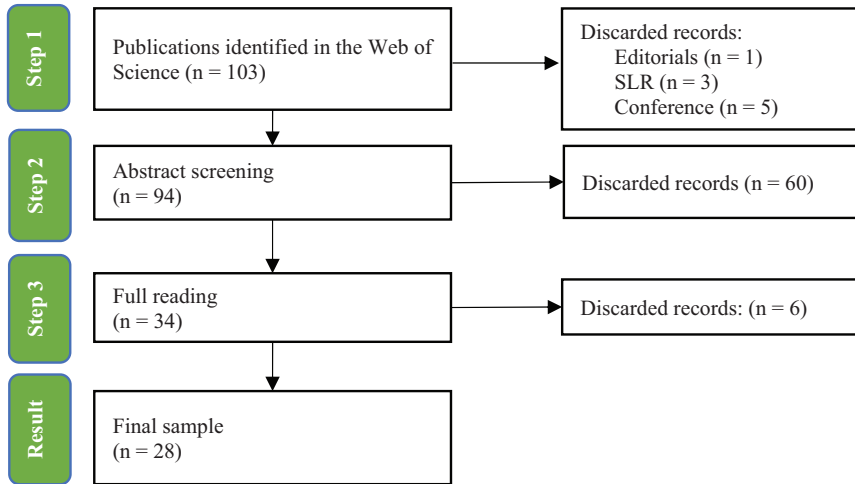


Figure 1. SLR procedure

Using these criteria, 103 papers were found (the procedure is visualized in Figure 1). One of the found papers was editorial, which was not relevant to SLR. Additionally, three papers were SLRs themselves (however not performed on the exact same topic) and could not help to answer the research questions. Additionally, it was decided to discard conference papers to assure the higher quality of the SLR (5 papers). Then, the abstracts of the papers were read to screen the articles for quality and relevance. At this point, only the relevant publications that could help to answer the research questions (thus, those whose abstracts contained keywords) were included. At this point, due to these preliminary screenings, 60 publications were discarded. The resulting 34 articles were thoroughly read, and some irrelevant articles were further identified. Thus, in the end, 28 publications were relevant to answer the research questions and were analysed further.

4. Results

Descriptive analysis and content analysis of the publications will be introduced in this section.

4.1. Descriptive analysis of the publications

The number of analysed publications and their citations are visible in Figure 2. The oldest papers are from 2019, and of course, the youngest are from 2023 (however, in that year, many more publications and citations will be added because of the early date of this search). Figure 2 shows that this topic is relevant and receiving increasing attention, which is confirmed by the remarkable 595 citations over the years (most of them in 2022). Additionally, there is no logical explanation why in 2020, there were no articles regarding this subject (perhaps due to the overall decline in publications in 2020 due to the Covid pandemic).

For the types of journals where articles are published, see Table 2 (only journals in which at least 2 analysed publications were published are included). Altogether, these articles were published in 17 journals.

The results are shown in Figure 3, where the larger the label is, the more often it was used as a keyword. Additionally, the colour shows the average year of publication of the papers in which keywords appeared. The figure revealed interesting trends when the attention, for example, was shifted from environmental management and sustainable development to integration and environmental performance.

4.2. Content analysis of the publications

Publications were further classified into 4 clusters that were derived from the research questions according to the content of the articles. The names of the clusters are “various types of performance”, “financial performance”, “indicators” and “BSC”. The first two clusters are derived from the first research question. The original idea was to create more clusters according to the detected type of performance; however, it was found that financial performance prevailed and other types of performance varied for each paper (environmental, marketing, social, operational, etc.). Additionally, the cluster “indicators” partly overlap with the other clusters because these papers can be used to answer both research questions, as is visible in Figure 4.

To answer the research questions, publications will be sorted according to Figure 4; however, in Table 3, it was decided that the cluster “indicators” show only the 4 publications that belong solely to this cluster (thus, the rest are categorized according to the other cluster to which they belong).

Altogether, as to the methodological approach, in the analysed publications, surveys made from questionnaires clearly prevail. Additionally, in several papers, a database is used, specifically the Thomson Reuters database, now called Refinitiv. In one publication, data from the Eurobarometer Survey were used. As publicly available data, mostly data from some annual or circularity reports were used. The data sample differs greatly, and its geographical focus certainly depends mostly on the nationality of the author(s). The methods are very specific; however, some types of regression or structural equation modelling are the most often used methods.

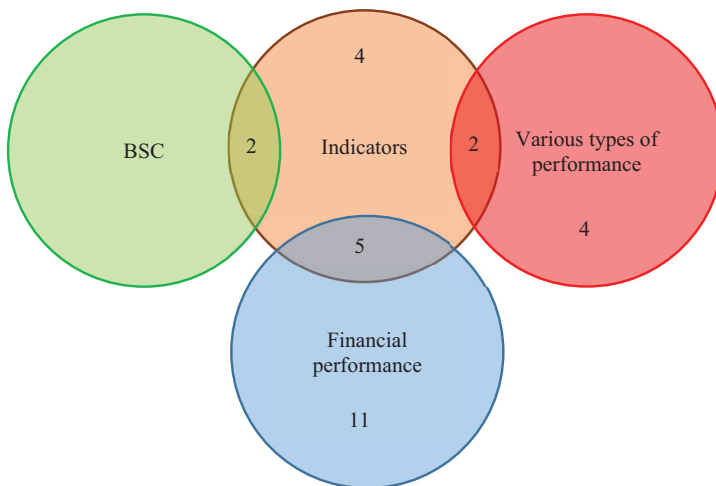


Figure 4. Categorization of publications according to the topics

Table 3. Categorization of publications (source: own elaboration, 2023)

Cluster	Citation	Methodological approach	Source of data	Sample	Method
Various types of performance	Dong et al. (2022)	Quantitative Survey	Questionnaire	295 Chinese firms	structural equation modelling (SEM)
	Khan et al. (2021)	Quantitative Survey	Questionnaire	404 firms from China and Pakistan	partial least squares SEM
	Tang et al. (2022)	Quantitative Survey	Questionnaire	330 firms engaged in supply chain operations	partial least squares SEM
	Yu et al. (2022a)	Quantitative Survey	Questionnaire	308 manufacturers from China	SEM
	Yu et al. (2022b)	Quantitative Survey	Questionnaire	286 firms from the Chinese automotive sector	CB-SEM
	Zikopoulos (2022)	Proposal of model	N/A	N/A	qualitative model
Financial performance	Alkaraan et al. (2023)	Quantitative	Publicly available data	2379 UK companies	computer-aided textual analysis and ordinary least squares
	Antonioli et al. (2022)	Quantitative Survey	Questionnaire	3000 Italian manufacturing firms	regression model (OLS) and t-test
	Atstāja and Spāde (2020)	Quantitative Case study	Internal data	1 firm	financial analysis, etc.
	Bartolacci et al. (2018)	Quantitative	Publicly available data	45 Italian waste management companies controlled by municipalities	normalized chi-square index and correlation index
	Bogdan et al. (2022)	Quantitative	Publicly available data	28 Romanian manufacturing listed companies 2017–2020	fixed effects model, OLS, two-stage least squares method
	Farooque et al. (2022)	Quantitative Survey	Questionnaire	255 Chinese manufacturing firms	SEM
	Hategan et al. (2021)	Quantitative Survey	Database	circa 700 large Romanian companies (2017–2019)	feasible generalized least squares (FGLS)
	Ioannidis et al. (2021)	Quantitative Survey	Database	143 large organizations	multiple hierarchical regression

End of Table 3

Cluster	Citation	Methodological approach	Source of data	Sample	Method
	Ionaşcu and Ionaşcu (2018)	Quantitative Survey	Database Thomson	266 quoted Romanian firms	regression analysis
	Johl and Toha (2021)	Quantitative Survey	Publicly available data	31 publicly listed energy companies from Malaysia	regression equation modelling
	Kwarteng et al. (2022)	Quantitative Survey	Questionnaire	617 firms from diverse business sectors in Ghana	N/A
	Li et al. (2022)	Quantitative Survey	Questionnaire	249 Chinese firms	hierarchical regression analysis
	Mazzucchelli et al. (2022)	Quantitative Survey	Questionnaire	404 large-sized manufacturing firms	SEM
	Moric et al. (2020)	Quantitative Survey	Eurobarometer	4237 SME EU	propensity-score-matching model
	Rodríguez-González et al. (2022)	Quantitative Survey	Questionnaire	460 companies in Mexico, automotive	structural equations through Partial Least Squares
	Sarfraz et al. (2022)	Quantitative Survey	Database	411 companies from the EU	multivariate econometric estimations
Indicators	Bianchini et al. (2022)	Quantitative, Qualitative	Questionnaire, Interview, document analysis	N/A	N/A
	Gupta et al. (2021)	Quantitative, Qualitative	Experts	10 experts	Delphi, MCDM
	Jain et al. (2018)	Qualitative Conceptual	N/A	N/A	N/A
	Kazancoglu et al. (2018)	Qualitative Conceptual	N/A	N/A	N/A
BSC	Torgautov et al. (2022)	Quantitative, Qualitative Survey/ Conceptual	Questionnaire, (literature)	41 managers	creation of a model
	Trisyulianti et al. (2022)	Quantitative, Qualitative Survey/ Conceptual	Questionnaire, internal data	15 managers	qualitative research coding method

4.2.1. Cluster 1: Various types of performance (n = 6)

Six articles are included in this cluster. The included articles address the influence of CE principles implementation on various types of performance. The articles will be briefly introduced with an emphasis on the type of performance they are dealing with, the indicators and results. The data and methods used to prove the relationship are shown in Table 3.

Dong et al. (2022) tested whether there is a positive effect of the reduce, reuse and recycle principle on environmental performance (measured, e.g., by the emission level of air pollutants or discharge level of solid pollutants) and market and financial performance (measured by ROA, ROI and ROS) and whether environmental performance itself has a positive effect on market and financial performance. All these effects were proven to be positive.

Similarly, Khan et al. (2021) proved the positive influence of CE on environmental and economic performance. They used several variables for CE, e.g., recycling and remanufacturing, circular purchasing and circular design (for CE). The variables for environmental and economic performance are not clearly stated.

Tang et al. (2022) proved a slightly positive effect of CE practices (green manufacturing, green design, remanufacturing and recycling) on firms' economic and environmental performance and organizational effectiveness.

Next, Yu et al. (2022a) examined the relationship between CE practices (for which ecological design and investment recovery are considered) and innovation, environmental and financial performance and found that "environmental and innovation performances mediate the positive effects of circular economy practices on financial performance" (Yu et al., 2022a, p. 1).

The fact that economic and operational performance can be positively influenced by the adaptation of CE practices was proven by Yu et al. (2022b). They used several variables, e.g., circular purchasing and circular design (for CE), profitability and market share (for economic performance) and quality and new product (for operational performance).

Zikopoulos (2022) proved existing positive impacts of newly manufactured and remanufactured products on social, environmental and financial performance.

The first cluster thus contains the publications (mainly from China) that study the influence of CE practices implementation on several types of performance (e.g., environmental, market, operational, innovation, social) except for financial performance. In this cluster, different indicators, methods and sample sizes are presented. As to the results, all of them proved a positive or a slightly positive relationship between CE practices and examined type of performance.

4.2.2. Cluster 2: Financial business performance (n = 16)

The publications included in this cluster (16) deal solely with the influence of CE implementation on financial performance. Again, the indicators and the results of the analysis are presented.

Alkaraan et al. (2023) revealed existing synergy between I4.0 technologies and CE actions and its impact on "strategic investment decision-making practices and companies' financial performance" (Alkaraan et al., 2023, p. 1). To assess the level of I4.0 technologies and CE techniques, self-constructed indices linked to the occurrence of specific keywords were used, and ROA was used.

The economic effect of CE practice implementation in the short run was studied by Antonioli et al. (2022), who found that "it is difficult to obtain economic gains from CE related innovations when taken in isolation" (Antonioli et al., 2022, p. 1), especially for SMEs that

“experience negative returns”. As economic indicators, they used balance sheet data. For the assessment of the CE level of the firm, they used the number of CE innovations introduced by a firm (for example, reduction in water usage, raw material usage, reduction in waste, etc.)

A case study on CE principle implementation and its economic effects (on financial performance and economic value) on one company was conducted by Atstāja and Spāde (2020). They found that adapting CE principles would be profitable for companies.

Additionally, the research conducted by Bartolacci et al. (2018) proved a slightly positive relationship correlation between the financial performance of companies (measured by ROA) and the good environmental practices related to separate waste collection (measured by waste collection rates and collection per capita).

Similarly, Bogdan et al. (2022) revealed a statistically significant positive relationship between the financial performance of companies (measured by ROA, ROE, Earnings per Share, Solvability and Current Ratio) and their disclosure of waste management information (measured by the index they propose).

Survey, in which respondents used a Likert scale to assess the implementation of activities regarding circular product design, circular procurement, cleaner production, end-of-life product and waste management, and cost and financial performance, was used by Farooque et al. (2022). The direct effect of circular supply chain management on cost and financial performance was supported.

Hategan et al. (2021) studied the companies that were required to report a nonfinancial statement. They aimed to identify the link between the evaluation scores they created and awarded to individual nonfinancial reports with selected variables (such as ROA, ROE, information on the website, foreign ownership, listed company, etc.). They found a positive statistically significant correlation between the score and all variables.

Ioannidis et al. (2021) indicated a positive relationship between the Reduce, Reuse, Recycle strategy and short-term profitability (measured by profits) as well as long-term financial performance (measured by Tobin's Q). As other indicators, they used green corporate governance, quality assurance policies, financial slack, HR slack, and the 3Rs environmental strategy.

Ionaşcu and Ionaşcu (2018) proved that leasing (seen as CE practice) can increase the economic performance of firms (measured by ROA, ROS, Tobin's Q and market-to-book value of equity).

Additionally, the relationship between proactive eco-innovation (measured by index) and firm financial performance (Tobin's Q) has been proven by Johl and Toha (2021). Kwarteng et al. (2022) studied the effects of CE practice (reducing, reusing, recycling, recovery, restoration of resources, distribution and consumption processes) implementation on business performance and proved a positive relationship. A Likert scale to assess the implementation of circular activities was used by Li et al. (2022), who revealed that practices such as “Reinvent and Rethink” and “Restore, Reduce and Avoid” can positively influence financial performance, whereas “Recirculate” cannot.

Mazzucchelli et al. (2022) tested whether there is a positive relationship between 3R (waste treatment, reduction, recycling) and brand reputation and then between brand reputation and financial performance. For each area, the study used constructs that were measured using several scale items. For example, the financial performance construct was measured by five scale items such as productivity, market share or ROI. Not all hypotheses were confirmed; however, the research proved that reduction has a positive effect on financial performance.

Data from Flash Eurobarometer 411 were used by Moric et al. (2020), who proved that the financial performance (measured by annual sales per employee) of organizations is

dependent on the adoption phase of the CE (they categorize the organizations as “Adopters”, “Prospective adopters”, “Planners” and “Nonadopters” according to the level of CE practice adaptation).

Rodríguez-González et al. (2022) proved that financial performance can be affected by the implementation of CE practices. Also, the relatively small influence of CE performance on the financial performance of companies was proven by Sarfraz et al. (2022). As financial performance indicators, they used WACC and ROA, and as CE indicators, they used resource use, waste recycled, management systems and emissions.

The second cluster thus contains the publications that solely study the influence of CE practices implementation on the financial performance of businesses. The cluster contains publications that study data from different parts of the world (half from Europe, half from non-European countries) using different indicators, methods and samples. The results almost exclusively confirm the positive relationship.

4.2.3. Cluster 3: Indicators (n = 13)

In the third cluster, publications dealing with the indicators for measuring business performance improvement due to the implementation of CE principles are included. This cluster overlaps greatly with others; thus, at first, publications that solely address the topic will be introduced, followed by the others. The list of possible indicators would be very long; thus, only examples are presented.

Bianchini et al. (2022) focused their attention solely on social indicators related to the CE and proposed them for strategic, tactical and operational levels. For example, the indicators for the strategic level were ethical and social commitment in the supply chain, corporate governance, diversity in the supply chain and valorization of people.

Gupta et al. (2021) proposed and verified the framework for the evaluation of sustainability business performance regarding Industry 4.0, cleaner production and the CE. They used the Delphi method and a multicriteria decision-making tool. The final list of assessed criteria regarding the CE comprises reuse and recycling infrastructure, end of life determination, supply chain traceability/information, reduction in supply-related risks, legal compliance, investment recovery and long-term profits.

Additionally, Jain et al. (2018) addressed circular supply chain management and the measurement of its performance and proposed a strategic framework including 16 indicators, such as product design/eco-design, new business models, sustainable procurement, supplier selection, manufacturing, material reduction, energy reduction, logistics, sales and marketing, product use/share, waste reduction, reverse logistics, reuse, remanufacturing, recycling, and end-of-life disposal.

A slightly different aim is the research of Kazancoglu et al. (2018), who dealt with green supply chain management and the monitoring of its performance in the context of the CE. They propose an assessment framework including “environmental, economic, logistics, operational, organizational and marketing performance” (Kazancoglu et al., 2018, p. 1283). Altogether, they proposed 21 subcriteria and 189 measures.

Some publications use the BSC (or Sustainable BSC, SBSC) approach to measure and manage business performance. Trisyulianti et al. (2022) conducted interviews with managers to validate their strategic framework for the adaptation of the CE using SBSC. Their interviews offer many suggestions for possible indicators for each of the 4 SBSC perspectives. Torgautov et al. (2022, p. 998) identified the BSC measures related to the CE in the construction sector.

Additionally, research focused on testing the relationship between CE and business performance can be put in this category because this type of research uses some indicators assessing the CE level (and the CE level can also be seen as a part of business performance, for example in terms of the BSC, it falls into the internal business process perspective). For example, Dong et al. (2022) use the level of waste recycling, waste collection, waste reprocessing, and waste use; the level of reduction in the production time, employees' working hours, energy consumption, and raw materials consumption; and the level of reuse of packing materials, equipment and consumables, raw materials to produce similar products and production scraps. Additionally, Sarfraz et al. (2022) use indicators such as resource use, waste recycling, the existence of quality management systems and emissions. Yu et al. (2022a, p. 6) use the following: "reducing the use of hazardous raw materials, improving material utilization, designing for recycling and reuse of products (...), sale of excess stock and scrap, recycling of reusable materials". Antonioli et al. (2022, p. 4) use the indicators that count the number of innovations introduced by a firm in the following areas: reducing water usage, reducing the use of raw materials, increasing the usage of renewable energy, reducing energy consumption, reducing waste, reusing waste, changing the design to increase reparability and recyclability, and reducing GHG emissions. Ionaşcu and Ionaşcu (2018) focused their attention only on the leasing and renting effects on economic performance; thus, they use the dummy variable for leasing and Lease Intensity. Another narrowly focused study was conducted by Bartolacci et al. (2018), who studied the effects of good environmental practices related to separate waste collection on financial performance. They measured it by waste collection rates and collection per capita. Farooque et al. (2022) proposed several constructs and their measurement items in the areas of circular product design, circular procurement, cleaner production and end-of-life product and waste management (see Farooque et al., 2022, p. 21).

Many publications with different indicators can be found in this cluster (perhaps thanks to the already-mentioned broad definitions of business performance and CE). The identified measures belong mainly to environmental areas and are not part of the clear framework for assessment; both findings confirm the necessity to do more research on this topic.

4.2.4. Cluster 4: BSC (n = 2)

The possibility of using a Sustainable BSC (SBSC) to implement and manage the CE concept for state-owned plantation enterprises in Indonesia was investigated by Trisyulianti et al. (2022). They examined previous works that developed SBSCs and their usefulness to CE implementation, proposed the framework to implement CE by using SBSC, and then they successfully validated it by using primary data (interviews with 15 managers) and secondary documents (company official documents).

A similar aim was made by Torgautov et al. (2022), who proposed a "strategic development framework to identify and select specific CE actions and measures" (Torgautov et al., 2022, p. 991) with a focus on the construction sector in Kazakhstan. To do that, the BSC was developed based mainly on 41 managers' opinions, who were asked to propose appropriate BSC measures. The authors prioritize the measures, analyse them by using cluster analysis and then construct the final BSC.

Although the last cluster includes only 2 publications dealing with BSC/SBSC in the context of CE, it reveals the possible and not-so-examined way to study the relationship between the implementation of CE principles and business performance improvement.

5. Discussion

As mentioned in the introduction, there are three literature reviews related to businesses' financial performance and the CE. The first deals with Industry 4.0, servitization and CE and their relationship to operational and financial performance (Atif et al., 2021). The second Kanzari et al. (2022) focuses on the circular business model in transition phases and its relationship to financial performance. The last Gonçalves et al. (2022) deals with the financial aspects of CE in terms of barriers that organizations have to face when adopting CE principles. Thus, the topics of these SLRs are more specific than in this research.

The 4 clusters created in this study represent papers with different aims. The first two clusters consist of publications that address the relationship between CE implementation and business performance improvement (RQ1). Due to the different types of studied performance, two clusters were made: the first cluster includes publications that deal with various types of performance ($n = 6$), and the second is solely focused on financial performance improvement ($n = 16$). Altogether, except for Antonioli et al. (2022), the positive relationship between CE implementation and performance improvement was, to some extent, proven in all of them (21). Furthermore, CE implementation positively affects environmental performance (5 cases), operational performance (2 cases) and market, innovation, and social performance. Additionally, the positive relationship between CE and brand reputation and strategic investment decision-making practices was revealed. Thus, RQ1 can be answered positively: according to the existing research, a positive relationship exists between CE implementation and business performance improvement.

Additionally, when analysing the content of these publications, it is visible that the definition of the CE concept and its measures differ greatly. When measuring financial performance, rentability indicators such as ROE, ROI, etc. are used (Alkaraan et al., 2023; Bartolacci et al., 2018; Bogdan et al., 2022; Dong et al., 2022; Hategan et al., 2021; Ionaşcu & Ionaşcu, 2018; Mazzucchelli et al., 2022; Sarfraz et al., 2022) or Tobin's Q (Ioannidis et al., 2021; Ionaşcu & Ionaşcu, 2018; Johl & Toha, 2021). However, in regard to measuring CE implementation, there is almost no agreement here. Some authors pay attention to circular design (Farooque et al., 2022; Khan et al., 2021; Yu et al., 2022a; Yu et al., 2022b), some to waste management (Bartolacci et al., 2018; Farooque et al., 2022; Mazzucchelli et al., 2022; Sarfraz et al., 2022), some to cleaner production and emissions (Dong et al., 2022; Farooque et al., 2022; Sarfraz et al., 2022), eco-innovations (Antonioli et al., 2022; Johl & Toha, 2021) and other topics related to CE and then construct appropriate measures. Thus, the inconsistency of the CE concept and its measures was also revealed.

As to RQ2, the third cluster consists of the publications that can help to answer it (what indicators are used to measure business performance improvement due to the implementation of CE principles). There are four publications that belong solely to this cluster and nine that belong to other clusters. As revealed when discussing Clusters 1 and 2, there is an inconsistency of the CE concept and, thus, as could be expected, a significant number of possible indicators. It is very difficult to find commonly used measures in these 13 publications. To those already mentioned in Cluster 1 and 2 (circular design, waste management, cleaner production, eco-innovations), indicators regarding reuse, recycling, or reduction (Antonioli et al., 2022; Dong et al., 2022; Gupta et al., 2021; Jain et al., 2018; Sarfraz et al., 2022; Yu et al., 2022a) can be added. All the identified measures belong mainly to environmental areas and are not part of the clear framework for assessment; thus, a possible research gap was identified. Of those four that belong solely to this cluster, one study focuses only on

social indicators Bianchini et al. (2022), the second uses the Delphi method and multicriteria decision-making tool to make a list of indicators to be assessed Gupta et al. (2021), the third proposes a strategic framework including 16 indicators Jain et al. (2018) and the last proposes an assessment framework for monitoring the performance of green supply chain management (Kazancoglu et al., 2018). To summarize, there is no clear answer to the RQ2. According to the existing research, the indicators used to measure business performance improvement due to the implementation of CE principles miss a clear structure and framework and mainly belong only to environmental areas.

Cluster 4 contains only two publications (Torgautov et al., 2022; Trisyulianti et al., 2022) because it aimed to analyse the appropriateness of a specific methodology (BSC or SBSC) to implement and manage the CE. The fact that only two publications were identified means that the topic was not sufficiently researched. However, those two publications can be used to answer the RQ3 because they represent the only existing research on this specific topic. Moreover, they confirm that BSC methodology can be used for CE implementation and its performance management.

Based on the findings of this SLR, a research framework according to the defined clusters (yellow dots) was proposed in Figure 5. The framework shows that due to CE implementation, the improvement of business performance can occur in terms of financial, environmental, operational, innovation, and social factors. Additionally, brand reputation and strategic investment decision-making practices

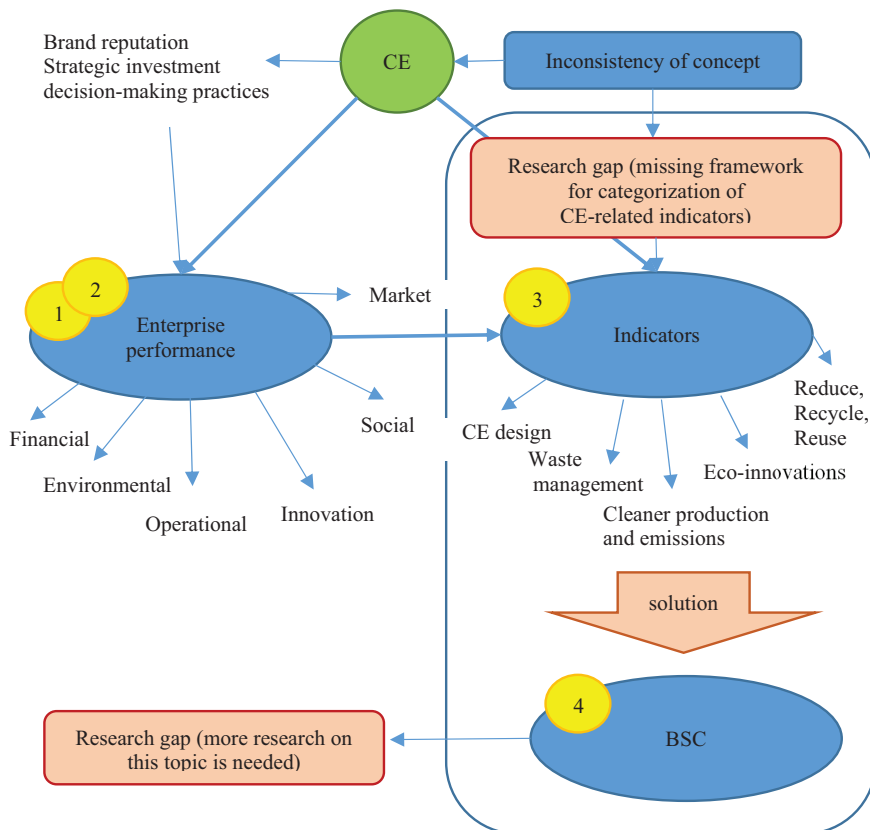


Figure 5. The research framework based on SLR

investment decision-making practices can be improved after this implementation. Then, the framework indicates the connection of this issue to the indicators for its measurement. The indicators are related to CE design, waste management, cleaner production and emissions, eco-innovations, and the concept of reduce, recycle, reuse. The inconsistency of the CE concept is shown at the top of the figure. This inconsistency causes problems with the right categorization of CE-related indicators; thus, the research gap is indicated. The framework also shows the BSC as the possible solution to the problem with a missing framework; however, more research is needed on this topic. Additionally, the framework stresses the need for the establishment of a clear and uniform definition of CE.

6. Conclusions

To conclude, as this study is the first SLR on the topic of business performance and its measurement in the context of CE practice adaptation, it makes several contributions to the theoretical and practical fields.

As to the theoretical field, this study emphasizes the positive relationship between CE implementation and some type of business performance (often financial performance) that was revealed in the existing literature. Additionally, the paper revealed the inconsistency of CE definitions, which causes the problem with the right measurement of the influence of CE adaptation on business performance. This should be solved by providing an easily understandable definition that could be accepted by all stakeholders and by proposing a clear framework for measurement. As one possibility, the use of the BSC as the framework seems reasonable, as was also revealed by this SLR.

The practical contributions resulted mainly from confirming the positive relationship between CE practices and business performance improvement (mainly financial). Although nowadays many people see environmental protection as a common thing that is done naturally, a part of society sees it as mandatory regulation, which costs much money and brings them no additional value. To change this image, the findings of this study could be used by the policy-makers and promoters of CE at the national level (for example, to promote new CE-related laws). Society needs to know that these “green” initiatives can help businesses to achieve better financial results. The same can be applied at the micro level, for example, by managers trying to persuade their superiors to adopt more “green” practices. Managers and business owners should be more willing to implement some CE practices if they are convinced about its financial benefits.

The limitations of this study are typical limitations that accompany all SLRs. The first is the use of only one scientific database (Web of Science). The authors are aware that the use of a single database limits the number of publications (because there are fewer publications indexed on the Web of Science than in Scopus, Google Scholar, etc.), and some quality papers could have been omitted. Second, some relevant articles may have been discarded during the article screening process. This was prevented by a separate reading by two authors. Third, publications focused on CE performance, in general, were omitted on purpose. Their inclusion would add a large number of publications that would be focused solely on matters related to nature protection and its measurement, which was not the direct aim of the research.

As the general aim of this paper was to determine the current state of the art, future research on this topic will follow, and in light of the results found, it will focus on the BSC and its possibilities for the measurement and management of CE practice implementation. On the other hand, from the authors’ point of view, there is no major need to further study

the possible relationships of CE implementation on business performance (especially in the case of financial), because no research gap was found there and the relationship was proven to be positive many times.

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