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Circular Economy: Laying the Foundations for Conceptual and Theoretical Development in Management Studies

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Manuscript Type:	Original Article
Keywords:	circular economy, circular competitiveness, economy-ecology reintegration, environmental paradigms, sustaincentrism

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2
3 ABSTRACT:
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5 This article develops conceptual and paradigmatic clarity in the circular economy literature from a
6 management studies perspective.
7

8 This article uses a systematic literature review for analysing how circular economy is currently
9 understood. It also reflects on how to establish paradigmatic anchoring of the circular economy in
10 the management field.
11

12 Multiple definitions of the circular economy exist but they depict the circular economy narrowly and
13 fail to incorporate aspects of competitiveness and profitability. Additionally, most of sustainability
14 management research displays shortcomings in the way this literature frames the organisation-
15 nature relationship.
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18 This article aims to support conceptual and theoretical development in the circular economy
19 literature and highlights opportunities for enhanced competitiveness and profitability deriving from
20 circular business model innovation. However, further research is welcomed to assess this
21 connection.
22

23 The conceptualisation of the circular economy proposed in this study emphasises aspects of
24 competitiveness and profitability, which is of relevance to management practitioners.
25

26 CUST_SOCIAL_IMPLICATIONS_(LIMIT_100_WORDS) :No data available.
27

28 This study addresses current shortcomings in how the circular economy is conceptualised. As a
29 result, it proposes a more comprehensive conceptualisation which also includes competitiveness
30 and profitability aspects and, thereby, is relevant from a management studies perspective. It also
31 provides paradigmatic anchoring to the circular economy concept by suggesting that the
32 Sustaincentric paradigm, which has received limited scholarly attention so far, is suitable to inform
33 circular economy research and practice.
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Table 1: Circular economy definitions
Source: From academic literature cited in table

Academic literature	Definitions of the CE	Source (A= identified by this author; K= identified by Kirchherr <i>et al.</i> , 2017; FS= identified by forward snowballing)
Blomsma and Brennan (2017: 603)	“An emergent framing around waste and resource management that aims to offer an alternative to prevalent linear take-make-dispose practices by promoting the notion of waste and resource cycling. Strategies such as, but not limited to, reuse, recycling, and remanufacturing operationalize this concept”.	K
Bocken <i>et al.</i> (2017a:1)	“A CE aims to keep products, components, and materials at their highest utility and value at all times. The value is maintained or extracted through extension of product lifetimes by reuse, refurbishment, and remanufacturing as well as closing of resource cycles—through recycling and related strategies. An alternative strategy for extension of product lifetimes may be to use products more efficiently through sharing them or making them multifunctional. All these strategies may be facilitated through changes in ownership relationships, such as leasing and product service systems”.	K
Bocken <i>et al.</i> (2017b: 487)	“The basic premises of the CE appear to be closing and slowing loops. Closing loops refers to (post-consumer waste) recycling, slowing is about retention of the product value through maintenance, repair and refurbishment, and remanufacturing, and narrowing loops is about efficiency improvements, a notion that already is commonplace in the linear economy”.	K
de Jesus and Mendonça (2018: 76)	“The CE can, therefore, be defined as a multidimensional, dynamic, integrative approach, promoting a reformed socio-technical template for carrying out economic development, in an environmentally sustainable way, by re-matching, re-balancing and re-wiring industrial processes and consumption habits into a new usage-production closed-loop system”.	A
den Hollander <i>et al.</i> (2017: 517)	“In a circular economy (CE), the economic and environmental value of materials is preserved for as long as possible by keeping them in the economic system, either by lengthening the life of the products formed from them or by looping them back in the system to be reused. The notion of waste no longer exists in a CE, because products and materials are, in principle, reused and cycled indefinitely”.	K
Franco (2017: 834)	“The circular economy is a purposefully designed, interconnected system where materials flow in a closed-loop manner in order to advance sustainability”.	A

Geisendorf and Pietrulla (2018: 779)	"In a circular economy, the value of products and materials is maintained, waste is avoided, and resources are kept within the economy when a product has reached the end of its life".	A
Geissdoerfer <i>et al.</i> (2017: 759)	"The Circular Economy as a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling".	K
Geng <i>et al.</i> (2013: 1526)	"A CE is an industrial system focused on closing the loop for material and energy flows and contributing to long-term sustainability. CE incorporates policies and strategies for more efficient energy, materials, and water consumption, while emitting minimal waste into the environment".	K
Haas <i>et al.</i> (2015: 765)	"The circular economy (CE) is a simple, but convincing, strategy, which aims at reducing both input of virgin materials and output of wastes by closing economic and ecological loops of resource flows".	A
Kirchherr <i>et al.</i> (2017: 224-225)	"A circular economy describes an economic system that is based on business models which replace the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes, thus operating at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations".	Definition by Kirchherr <i>et al.</i> themselves
Korhonen <i>et al.</i> (2018a: 547)	"CE is a sustainable development initiative with the objective of reducing the societal production-consumption systems' linear material and energy throughput flows by applying materials cycles, renewable and cascade-type energy flows to the linear system. CE promotes high value material cycles alongside more traditional recycling and develops systems approaches to the cooperation of producers, consumers and other societal actors in sustainable development work".	A
Korhonen <i>et al.</i> (2018b: 39)	"Circular economy is an economy constructed from societal production-consumption systems that maximizes the service produced from the linear nature-society-nature material and energy throughput flow. This is done by using cyclical materials flows, renewable energy sources and cascading-type energy flows. Successful circular economy contributes to all the three dimensions of sustainable development. Circular economy limits the throughput flow to a level that nature tolerates and utilises ecosystem cycles in economic cycles by respecting their natural reproduction rates".	A

Kumar <i>et al.</i> (2019: 1069)	“The CE can be defined as an economic growth and development system which unifies economy with natural resources and environment”.	A
Masi <i>et al.</i> (2017: 16)	“The CE [is] a regenerative and restorative economic framework, which decouples economic growth from environmental degradation and which seeks to preserve economic, social, and environmental value while contributing to system resilience”.	A
Murray <i>et al.</i> (2017: 378)	“The Circular Economy is an economic model wherein planning, resourcing, procurement, production and reprocessing are designed and managed, as both process and output, to maximize ecosystem functioning and human well-being”.	K
Prieto-Sandoval <i>et al.</i> (2018: 610)	“The circular economy is an economic system that represents a change of paradigm in the way that human society is interrelated with nature and aims to prevent the depletion of resources, close energy and materials loops, and facilitate sustainable development through its implementation at the micro (enterprises and consumers), meso (economic agents integrated in symbiosis) and macro (city, regions and governments) levels. Attaining this circular model requires cyclical and regenerative environmental innovations in the way society legislates, produces and consumes”.	FS
Sacchi Homrich <i>et al.</i> (2018: 534)	“CE is a strategy that emerges to oppose the traditional open-ended system, aiming to face the challenge of resource scarcity and waste disposal in a win-win approach with economic and value perspective”.	A
Suárez-Eiroa <i>et al.</i> (2019: 958)	“Circular economy is a regenerative production-consumption system that aims to maintain extraction rates of resources and generation rates of wastes and emissions under suitable values for planetary boundaries, through closing the system, reducing its size and maintaining the resource's value as long as possible within the system, mainly leaning on design and education, and with capacity to be implemented at any scale”.	FS
van Buren <i>et al.</i> (2016: 1)	“A circular economy aims for the creation of economic value (the economic value of materials or products increases), the creation of social value (minimization of social value destruction throughout the entire system, such as the prevention of unhealthy working conditions in the extraction of raw materials and reuse) as well as value creation in terms of the environment (resilience of natural resources)”.	K
Webster (2013: 542-543)	“Built increasingly on renewables, and the endless flow of energy from the sun (energy in surplus), a circular economy is one which transforms materials into useful goods and services (waste ↔ food). It builds capital and maintains it' (...). Like all living systems, a circular economy must be dynamic but adaptive, and if enduring, it must be effective, neither courting disaster by over-emphasizing efficiency	A

	(brittleness) or too resistant to change (stagnation) It celebrates diversity— of scale, culture, place, connection and time because a dynamic system is full of change, by definition, and thriving in such an environment requires diversity—a fount of creative adaption, a means of resilience, a source of redundancy or back up. It is led by business for a profit within the ‘rules of the game’ decided by an active citizenship in a flourishing democracy”.	
Zhijun and Nailing (2007: 95)	“The circular economy, which is a mode of economic development based on ecological circulation of natural materials, requires compliance with ecological laws and sound utilization of natural resources to achieve economic development. It is, essentially, an ecological economy that follows the principles of “reducing resource use, reusing, and recycling”, with the objectives of reducing the resources that enter the production process, effecting multiple use of the same resources in different ways, and reusing waste from one facility as a resource for other facilities”.	K

Table 2: Sustaincentrism versus CE principles

Source: Based on EMF (2015); EMF et al. (2015); EMF and McKinsey (2012); Gladwin et al. (1995); Loiseau et al. (2016); Valente (2012); ZWS (2015)

Sustaincentrism principles		Correspondent principles and characteristics of the CE	Connections
<i>Inclusiveness</i>	Concerns for multiple systems, i.e. human, social, economic and environmental across time and space are considered.	<i>Foster system effectiveness;</i> <i>Diversity builds strength;</i> <i>Preserve and enhance natural capital;</i> <i>Waste is designed out;</i> <i>Think in systems;</i> <i>Optimise resources yields;</i> <i>Shift to renewable energy sources;</i> <i>Think in cascades.</i>	The CE promotes the elimination of negative environmental externalities (pollution in its various forms) through using only renewable energy and materials whenever possible, managing materials in ‘biological’ and ‘technical’ cycles and more ecologically effective and efficient use of resources, which is also instrumental to a fairer distribution of resources across time and space. CE thinking also appreciates and fosters diversity in economy to attain resilience and prosperity; it promotes all-encompassing value creation (economic, environmental and social) and recognises the interdependencies among the many entities in our complex world. As result, the CE principles and characteristics identified in this row match the principle of ‘ <i>inclusiveness</i> ’ in Sustaincentrism.

<i>Connectivity</i>	Systems are interconnected and not isolated and, therefore, it is necessary to understand the impact that each has on the other.	<i>Think in systems.</i>	As noted above in this table, CE thinking acknowledges the connections existing within the many parts in a system and it also takes them into account in the transition towards its implementation. Therefore, ' <i>think in system</i> ' as a characteristic of CE thinking, matches the principle of ' <i>connectivity</i> ' in Sustaincentrism.
<i>Equity</i>	Fair distribution of resources.	<i>Optimise resources yields.</i>	Using resources more efficiently and effectively matters in terms of equity. Notably, using resources more wisely today means that future generations will not be secluded from the possibility of using them. Hence, ' <i>optimise resource yields</i> ' principle in the CE matches the principle of ' <i>equity</i> ' in Sustaincentrism.
<i>Prudence</i>	Human activities should take place within ecological limits.	<i>Preserve and enhance natural capital;</i> <i>Waste is designed out;</i> <i>Optimise resource yields;</i> <i>Think in systems;</i> <i>Think in cascades;</i> <i>Shift to renewable energy sources;</i> <i>Foster system effectiveness.</i>	In addition to the reasons outlined in the first row of this table, ' <i>think in cascades</i> ' in the CE contributes to ease the ecological impact of production and consumption systems. Cascading biological materials across different applications before returning them to nature as nutrients, ensures that valuable feedstocks are recovered in different production processes. Therefore, the CE principles and characteristics identified in this row match the principle of ' <i>prudence</i> ' in Sustaincentrism.
<i>Security</i>	Safety from persistent threats.	<i>Shift to renewable energy sources;</i> <i>Preserve and enhance natural capital;</i> <i>Waste is designed out;</i> <i>Foster system effectiveness;</i> <i>Optimise resource yields;</i> <i>Diversity builds strength.</i>	Preserving and restoring natural capital along with a more effective and efficient use of resources ensure against natural resources and ecosystem services decline, upon which humans and organisations depend for their survival. The more effective and efficient use of natural resources also enhances resilience in the face of environmental and commodities price crises (Loiseau <i>et al.</i> 2016). Furthermore, using renewable energies strengthens system resilience and prosperity because of both reduced exposure to external shocks, i.e. oil price and supply volatility, and dependence on scarce resources (EMF <i>et al.</i> 2015). The CE is also considered as an appropriate mitigation strategy against the threat of climate change. "By recirculating products rather than disposing of them after use, the circular economy retains product and material value much better than the linear economy we have today and as a result, reduces demand for both raw resource inputs and waste disposal, two activities with high carbon impacts" (ZWS, 2015: 3). Therefore, the CE principles and characteristics identified in this row match the principle of ' <i>security</i> ' in Sustaincentrism.

Circular Economy: Laying the Foundations for Conceptual and Theoretical Development in Management Studies

Abstract

Purpose

This article develops conceptual and paradigmatic clarity in the circular economy literature from a management studies perspective.

Research design

This article uses a systematic literature review for analysing how the circular economy concept is currently understood. It also reflects on how to establish paradigmatic anchoring of the circular economy in the management field.

Findings

Multiple definitions of the circular economy exist but they depict the circular economy narrowly and fail to incorporate aspects of competitiveness and profitability. Additionally, most of sustainability management research displays shortcomings in the way this literature frames the organisation-nature relationship.

Research limitations/implications

This article aims to support conceptual and theoretical development in the circular economy literature and highlights opportunities for enhanced competitiveness and profitability deriving from circular business model innovation. However, further research is welcomed to assess this connection.

Practical implications

The conceptualisation of the circular economy proposed in this study emphasises aspects of competitiveness and profitability, which is of relevance to management practitioners.

Originality

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3 This study addresses current shortcomings in how the circular economy is conceptualised. As
4
5 a result, it proposes a more comprehensive conceptualisation which also includes
6
7 competitiveness and profitability aspects and, thereby, is relevant from a management studies
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9 perspective. It also provides paradigmatic anchoring to the circular economy concept by
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11 suggesting that the Sustaincentric paradigm, which has received limited scholarly attention so
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13 far, is suitable to inform circular economy research and practice.
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17 **Keywords** - circular economy, circular competitiveness, economy-ecology reintegration,
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19 environmental paradigms, Sustaincentrism.
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22 **Paper type** - Research paper
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28 29 **1. Introduction**

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31 The circular economy (CE hereafter), understood as an economy wherein value creation is
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33 decoupled from the consumption of finite resources (EMF *et al.*, 2015), is becoming more and
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35 more relevant to corporate strategies (Mishra *et al.*, 2019) since it “opens up opportunities for
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37 companies to build competitive advantage, create new profit pools, develop resilience and
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39 provide solutions to some of the most important issues facing business today”
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41 (PricewaterhouseCoopers, 2018: 1). Simultaneously, academic engagement with the CE has
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43 risen substantially in the last couple of years and with it the number of CE definitions proposed.
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45 Whilst the openness of the debate about how to define the CE is beneficial at the early stages
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47 of this emerging field, such a plurality of views brings some criticalities to advance conceptual
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49 development, theoretical building and practical implementation. In fact, the conceptual
50
51 confusion surrounding the CE concept has been referred to as “circular economy babble”
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53 (Kirchherr *et al.*, 2017: 228) leading to the conclusion that the CE is still a contested concept
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3 (Korhonen *et al.*, 2018a) with the negative consequence that these discordant views may
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5 weaken its potential (Reike *et al.*, 2018).
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10 Yet despite the relative abundance of scholarly studies, the conceptual and theoretical
11 foundations of the CE are only partially and insufficiently investigated (Bruel *et al.*, 2018;
12 Geissdoerfer *et al.*, 2017). Furthermore, it is environmental and engineering sciences that have
13 contributed the most to the CE literature in fields like Industrial Ecology compared to
14 management studies (Lahti *et al.*, 2018; Sehnem and Vazquez-Brust, 2018). Lahti *et al.*
15 (2018) find that there is little engagement among management and organisations studies
16 scholars with the CE: “the empirical evidence from research on the circular economy has not
17 been analyzed or synthesized from a management or organizational theory perspective, which
18 implies a limited focus on profitability and competitive advantage” (p. 2). On a similar line,
19 Urbinati *et al.* (2017) underline that the CE and the strategic management fields have not cross-
20 fertilised each other yet. As a result, this article asks: *how can the CE be conceptualised to*
21 *address current definitional shortcomings and advance its understanding from a management*
22 *studies perspective?*
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44 Additionally, scholars have warned that knowledge production in management research
45 has not been very effective in avoiding current sustainability failures (Zollo and Freeman,
46 2010). This demands a reflection on how the relation between organisations and their natural
47 environment is framed, by investigating the ontological (related to the constituents of reality
48 and their relationships) and epistemological (relating to knowledge production) assumptions
49 underlying paradigms or worldviews to advance research and practice of corporate
50 sustainability. In fact, Borland *et al.* (2016) have argued that current management literature it
51 is not tightly linked with eco-centric thinking, i.e. with principles of ecological sustainability.
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3 This is detrimental to the emergence of more radical, transformational corporate sustainability
4 strategies which, in contrast, develop when assuming close interrelationship and responsibility
5 towards nature and society (*ibid.*). Given both the relevance of addressing paradigmatic
6 limitations in sustainability management research, and the inexistence of paradigmatic clarity
7 in the CE field (Blomsma and Brennan, 2017), this article asks: *how can CE paradigmatic*
8 *anchoring in management studies be established?*
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19 By answering these two research questions this article contributes to build the much
20 needed conceptual and paradigmatic clarity in the CE field, which is instrumental to both
21 advancing the field intellectual tradition and thereby its conceptual and theoretical
22 development, and practical implementation. This research also establishes a more direct
23 academic engagement of management studies with the CE concept, which has been pretty
24 limited to date. Furthermore, this article takes forward CE research along the line of argument
25 suggested by Kumar *et al.* (2019) in this journal, who have argued that although a number of
26 CE definitions have been proposed to date, “each of them seems to lack a few of the elements
27 that would render them complete” (p. 1069).
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42 The remaining parts of this article are organised as it follows. Next, the research method
43 is described. Subsequently, CE thinking and principles, current conceptualisations and the
44 alternative conceptualisation of CE that this article builds, are introduced. Then, the CE
45 anchoring to environmental paradigms is discussed. The article concludes summarising
46 contribution and suggesting future lines of enquiry.
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56 **2. Research Method**

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3 To answer to the first research question, this article uses a systematic literature review, a
4 method enabling researchers to synthesise the state-of-art of research in a specific field (Adams
5 *et al.*, 2017; Denyer and Tranfield, 2009). Electronic database searches are among the most
6 common strategies for sampling the relevant literature and they enable the collection of all the
7 available evidence about a specific research topic (Tranfield *et al.*, 2003). Although they are
8 widely used, databases searches are not without challenges. These pertain to the choice of the
9 databases, their different interfaces, search conventions and search limitations and so they point
10 to the need to use alternative approaches (Wohlin, 2014). In contrast to exhaustive strategies -
11 aiming at collecting all relevant studies - purposeful sampling strategies seek to find
12 information-rich studies that provide useful insights and a deep understanding of the
13 phenomenon under investigation (Hammerstrøm *et al.*, 2017). Purposeful sampling strategies
14 can be implemented through the use of the snowballing procedure (Hammerstrøm *et al.*, 2017;
15 Wohlin, 2014). Snowballing consists of identifying first relevant studies starting from key
16 publications, and then other relevant publications are added to the sample including both those
17 in the reference lists of the initial set of key publications (backward snowballing), and those
18 citing these key publications (forward snowballing) (*ibid.*). Therefore, this article uses
19 purposeful sampling strategy and the snowballing procedure to answer to the first research
20 question. This methodological choice is also consistent with the research approaches followed
21 in current CE literature (e.g., Blomsma and Brennan, 2017; Geissdoerfer *et al.*, 2017).
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48 A good starting point in snowballing is to identify an initial set of highly cited papers in
49 the area of the systematic literature study (Wohlin, 2014). It follows the identification of further
50 papers through backward and forward snowballing until no new papers are found; all the
51 identified papers go in the data extraction stage (*ibid.*). To identify the initial set of relevant
52 and influential papers, *Google Scholar* was used following Wohlin (2014), who suggests that
53 it is appropriate in order to avoid bias in favour of any particular publisher. 'Circular economy
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3 concept' was the search query used and the selection of relevant papers was limited to the time
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5 frame between 2010 and 2018, when CE-named studies started to appear and subsequently
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7 developing.
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11 The study by Kirchherr *et al.* (2017), which collects a recent, systematic and
12
13 comprehensive sample of CE definitions (n= 114), drawn from different sources, was identified
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15 as a highly cited paper (cited by 270 on the 5th of May, 2019). As the number of CE definitions
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17 in Kirchherr *et al.*'s study could be considered of a satisfactory size, given the recent
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19 development of CE literature, this study was used as a point of departure for the analysis of the
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21 CE definitions (the complete sample of these definitions can be downloaded as supplementary
22
23 material accompanying Kirchherr *et al.*'s article at the publisher website). Excluding non-
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25 academic sources (n= 34), restricted the sample size (n= 80). A careful reading of the remaining
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27 CE definitions, revealed that: a) some of the proposed conceptualisations were cross-
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29 referencing existing conceptualisations; b) others linked the CE to its antecedents; c) and some
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31 others did not explicitly define the CE. For instance, Kirchherr *et al.* include in their sample
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33 Cullen's (2017) definition which quotes the CE conceptualisation articulated by the Ellen
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35 MacArthur Foundation, one of the leading global institutions working to promote the CE, as:
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37 "a circular economy is one that is restorative and regenerative by design and aims to keep
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39 products, components, and materials at their highest utility and value at all times..." (EMF,
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41 2015: 2). This result is also corroborated by Reike *et al.* (2018) who, in a critical review of the
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43 CE literature, maintain that "hardly any specific definitions [are] put forward" (p. 249) when
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45 it comes to how the CE is conceptualised. Consequently, explicitness and originality were
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47 added as inclusion criteria. By original CE definitions it is meant that even if they build on CE
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49 thinking and principles, they are articulated in a more novel manner rather than mostly drawing
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51 from existing conceptualisations. The adoption of these additional inclusion criteria further
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53 reduced the sample size (n= 9). By conducting some forward snowballing and including only
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3 academic articles written in English, other two academic papers conceptualising the CE were
4 identified, which increased the sample size (n=11). Moreover, other definitions of the CE found
5 in academic studies subsequent to Kirzherr's study were added (n= 11). Overall, 22
6 definitions of the CE were chosen on the basis of the inclusion criteria and subjected to further
7 analysis.
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16 The papers included in the sample for data extraction respond to the criteria according to
17 which a successful snowballing procedure is built: different research communities, publishers,
18 years and authors are represented; they are identified on the basis of the research question, and
19 given that academic research on the CE has only recently started proliferating (from 2016), the
20 sample size is appropriate to reflect how the CE is approached and conceptualised (Wohlin,
21 2014). The selected conceptualisations of the CE are listed in alphabetical order in Table 1.
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37 In order to appraise the definitions of the CE for the purpose of this research enquiry, it
38 is important to offer an overview of CE thinking and principles. By comparing contemporary
39 definitions of the CE with the principles underlying the CE and viewing the CE from a
40 management perspective, limitations in current understandings are identified and hence the
41 need for a new conceptualisation of the CE becomes clearer. This is accomplished in the next
42 paragraph.
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54 **3. Circular Economy: Principles and Conceptualisation**

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56 CE thinking draws on different schools of thought in the economics, industrial ecology and
57 sustainable business literature and its origins have been detailed.
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6 CE principles and characteristics, derived from practitioners' literature (EMF, 2015;
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8 EMF *et al.*, 2015; EMF and McKinsey, 2012), are summarised as follows. *Foster system*
9
10 *effectiveness*: the CE promotes the elimination of negative environmental externalities
11
12 (pollution in its various forms) and the use of renewable energies and materials. *Diversity*
13
14 *builds strength*: the resilience of living systems is guaranteed by biodiversity. Analogously, CE
15
16 thinking appreciates and fosters diversity in economy to attain resilience and prosperity. *Waste*
17
18 *is designed out*: by using materials in accordance with 'biological' and 'technical' cycles.
19
20 Biological or renewable materials are conceived so that they can go back to the eco-system at
21
22 the end of their useful life. Technical (synthetic or mineral) materials are designed to be used
23
24 in multiple cycles of production and use through maintenance, repairing, refurbishing,
25
26 remanufacturing and recycling, once materials quality is ensured. *Think in systems*: in a CE,
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28 system emphasis means to recognise that interdependencies occur among the many entities in
29
30 our complex world but also that economic value should be generated alongside environmental
31
32 and social value creating a virtuous development cycle. System thinking is evoked quite often
33
34 in sustainability debates because it adopts a more holistic view, which is crucial for addressing
35
36 the complexities of sustainability concerns (Vildåsen *et al.*, 2017). *Optimise resources yields*:
37
38 it involves maximising the value of resources over time in both technical and biological cycles.
39
40 *Shift to renewable energy sources*: a CE is based only on renewable energies. *Think in*
41
42 *cascades*: cascading biological materials across different applications before returning them to
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44 nature as nutrients, ensures that valuable feedstocks are recovered in different production
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46 processes. *Preserve and enhance natural capital*: only renewable energies and materials should
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48 be used whenever possible.
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3 Table 1 grouped only the most explicit and original scholarly definitions of the CE
4 selected in this study. However, some overlap still occurs across them. They also mostly give
5 a narrow representation of the CE since they concentrate on the aspect of cycling materials
6 and, hence, on end-of-life materials recovery strategies. Although this is pertinent since CE
7 thinking, aiming at modelling the functioning of the economic system upon that of ecosystems,
8 seeks to design out the concept of waste (EMF and McKinsey, 2012; 2013), few current
9 definitions give attention to the broader CE characteristics and principles. CE principles also
10 acknowledge: a) preserving and restoring natural capital; b) promote system effectiveness not
11 just in material flows, and c) systems thinking and diversity (EMF, 2015; EMF *et al.*, 2015).
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26 In addition, the relevance of the implementation of CE principles within corporate
27 strategies for better competitiveness and profitability has been clearly emphasised (e.g., EMF
28 and McKinsey, 2012; Lacy and Rutqvist, 2015). In fact, new business models are highlighted
29 as a critical building block for successful implementation of CE at scale and as a means through
30 which create and capture value (EMF and McKinsey, 2012; EMF, 2015). Not only can circular
31 business models reduce resource depletion and pollution but also be a source of competitive
32 advantage via cost reductions, new revenue streams and better risk management (Jørgensen
33 and Pedersen, 2018). Therefore, a ‘circular’ competitive advantage can be obtained by
34 implementing innovative business models enhancing resource efficiency and customers’ value
35 along the entire lifetime of a product (Lacy and Rutqvist, 2015). An even stronger argument in
36 favour of the competitiveness angle of circular principles is made by Landrum (2018), who
37 maintains that incorporating circularity in corporate strategies equals to the “blue ocean (Kim
38 and Mauborgne, 2005) of sustainability strategy, an uncontested market space to be seized for
39 competitive advantage” (Landrum, 2018: 304).
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3 Business models can take varying forms in contributing to a CE (Lüdeke-Freund *et al.*,
4 2019), though any attempt to categorise potential circular business models is simplistic as the
5 real world is always more complex and distinctions may become blurred in practice. There are
6 business models that find value from industrial symbiosis, where residuals from one production
7 process become the input to another. They can occur within one company but may involve co-
8 operating firms. *British Sugar* has turned waste streams and emissions from its core sugar
9 business into valuable co-products (e.g., tomatoes, bioethanol, soil conditioner), realising new
10 revenues streams and reducing costs, and consequently improving its competitive advantage
11 and profitability (Short *et al.*, 2014). Additionally, there are business models which can
12 generate company value by increasing product durability and raising resource productivity
13 through a cyclical process of resource reuse. Products can be reclaimed after use and materials
14 re-used, and this is encouraged by retaining ownership and leasing or hiring out products under
15 a service contract. *Philips*, the Dutch manufacturer of light bulbs, sells lighting services rather
16 than light bulbs and it is a successful example of product-service systems in a CE. *Philips*
17 selects and installs the most appropriate lighting equipment for its customers who are then
18 charged on a pay per use model, which takes into account the hours of lighting services
19 provided and the lighting capacity (Larsson, 2018). Resource productivity can be also enhanced
20 by leveraging on the use of innovative and digital technologies to improve efficiency and
21 product/process performances. *WinSun*, a Chinese construction company uses 3D-printing to
22 build full-sized houses and apartments using 30-60% less material than in traditional
23 construction (EMF *et al.*, 2015). A Canadian company, *Do It Right This Time (DIRTT)*, builds
24 modules for the construction industry in a factory setting at a cost that is 50% below on-site
25 construction (*ibid.*). Furthermore, recycling business models contribute to greater resource
26 productivity. *Interface*, a leading manufacturer of carpet tiles, has joined the 'Healthy Seas'
27 initiative: the nylon found in fishing nets abandoned in the ocean is recycled into new nylon
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3 yarn that goes in the production of carpet tiles (Lacy and Rutqvist, 2015). Economic but also
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5 broader value (including ecological value) is produced.
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8 Whilst the economic rationale of the CE thinking has been highlighted in some academic
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10 studies (see, for instance, Geissdoerfer *et al.*, 2017), the scholarly definitions examined in this
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12 article, with the exception of Webster (2013), fail to incorporate aspects of competitiveness
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14 and profitability. This outcome can be viewed in the light of the fact that the academic literature
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16 on the CE suffers from both a limited management studies contribution (Lahti *et al.*, 2018),
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18 and little investigation over how the CE could concretely offer opportunities for economic
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20 value creation at the company level (Ranta *et al.*, 2018). This is an additional critical limitation
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22 of the CE definitions available to date. Based on these arguments, the following proposition
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24 about a more comprehensive definition of the CE is made:
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31 **P₁** : *the circular economy is a transformational and systemic vision for a more ecologically*
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33 *effective economic system that works within planetary limits, and thereby maintains and*
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35 *rebuilds natural capital. It is enabled by multiple, cooperative and simultaneous innovations*
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37 *at different scales in the wider socio-economic context involving regulation, policy and*
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39 *production and consumption systems. Companies in a circular economy can attain a sustained*
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41 *competitive advantage through innovative business models wherein circular principles in*
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43 *offerings and relationships enable the creation, delivery and capture of economic value, whilst*
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45 *ecological and social value are accrued by nature and society.*
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51 **4. Circular Economy and Environmental Paradigms**

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53 The conceptualisation of the CE just proposed adds relevance to the CE concept from a
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55 strategic management perspective and management practice. Nonetheless, it demands
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57 management scholars to critically evaluate how CE underlying assumptions fit with
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3 worldviews or environmental paradigms to establish paradigmatic anchoring, which is a
4 precondition for theory building and development in the CE field. Notably, the
5 conceptualisation of the CE presented here refers to the CE as... *a system that works within*
6 *planetary limits*... This statement poses immediately ontological and epistemological
7 questions pertaining to the relationship between organisations and their natural environment.
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17 The necessity of the rethinking of organisational paradigms that it is evoked here was
18 started by scholars in management and organisations studies in the 1990s, who questioned the
19 suitability of organisational paradigms or worldviews for management research¹. Paradigms as
20 famously put by Kuhn (1970) in *The Structure of Scientific Revolutions*, are “universally
21 recognized scientific achievements that for a time provide model problems and solutions to a
22 community of practitioners” (p. viii) and therefore, they “provide models from which spring
23 particular coherent traditions of scientific research” (p. 10). Gladwin *et al.* (1995) warned that
24 “modern management theory is constricted by a fractured epistemology, which separates
25 humanity from nature (...). Reintegration is necessary if organizational science is to support
26 ecologically and socially sustainable development” (p. 874).
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42 These calls for reconsidering the foundations of much of management theory have not
43 received enough attention, making very little inroads in mainstream management journals
44 (Williams *et al.*, 2017; Winn and Pogutz, 2013). Consequently, academic research has not been
45 very successful in driving corporate sustainability outcomes (Montiel and Delgado-Ceballos,
46 2014). Undoubtedly, more inclusive epistemological assumptions in management research are
47 needed so that the natural environment becomes relevant in organisational processes and
48 decision making (Hoffman and Ehrenfeld, 2015; Starik and Kanashiro, 2013). A worldview of
49 nested systems - with the economy as a subsystem of ecology - is necessary as a prerequisite
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3 for guiding the implementation of strategies that are consistent with sustainable development
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5 (Spangenberg, 2015).
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8 Taking into account the necessity of overcoming these limitations in management
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10 research and to answer to this article second research question, this research discusses Gladwin
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12 *et al.*'s (1995) call for reintegration of the ecological domain within modern management
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14 theory. In line with this, it is argued here that anchoring management research in *strong*
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16 *sustainability*, wherein organisations are viewed as embedded in their wider socio-ecological
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18 system with the consequence that their activities take place within ecological limits (Roome,
19
20 2012), is pertinent. *Strong sustainability*, which also resonate with the more recent concepts of
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22 *biophilic organisation* (Jones, 2016) and *bio-participation* (Skene, 2018) as a means to
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24 progress with corporate sustainability via reintegration of human systems within ecological
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26 systems, has yet to fertilise current business research and education (Landrum, 2018; Roome,
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28 2012). Ignoring that organisations rely on the ecosystem for their survival, and that their actions
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30 have impact upon the ecosystem through feedback loops, is not beneficial to the development
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32 of a systemic sustainability management perspective (Williams *et al.*, 2017).
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40 This article maintains that Gladwin *et al.*'s (1995) environmental paradigm of
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42 Sustaincentrism, which mirror principles in *strong sustainability*, is suitable to establish
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44 paradigmatic anchoring of the CE in management studies. A formal definition of
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46 Sustaincentrism does not exist but scholars refer to its underlying principles (Valente, 2012).
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48 According to Gladwin *et al.* (1995) "for a worldview to be congruent with sustainable
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50 development it must manifest inclusiveness, connectivity, equity, prudence, and security" (p.
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52 884). Principles in Sustaincentrism can be explained as it follows: *inclusiveness* (consideration
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54 is given to multiple systems, human, social, economic and environmental across time and
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56 space); *connectivity* (systems are interconnected and not isolated from each other, and
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3 therefore, it is necessary to understand the impact that each has on the other); *equity* (fair
4 distribution of resources); *prudence* (human activities should take place within ecological
5 limits) and *security* (safety from persistent threats) (Gladwin *et al.*, 1995; Montiel and Delgado-
6 Ceballos, 2014; Valente, 2012).
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15 Empirical evidence of the application of Sustaincentrism at the firm level is limited
16 (Valente, 2012). However, here it is argued that it can be appropriate to establish paradigmatic
17 anchoring with the CE. System thinking, which underlies Sustaincentrism, recognises the
18 interconnectedness existing between economic, ecological and social systems, and so it is very
19 useful to better frame the organisation and natural environment relationship and the
20 implications this has for companies activities (Williams *et al.*, 2017). Systems thinking and the
21 wider Sustaincentrism principles are attuned to CE thinking, which is also consistent with a
22 *strong sustainability* view (Loiseau *et al.*, 2016). Table 2 compares in details Sustaincentrism
23 principles with CE principles. It also illustrates the reasons why the connection between the
24 two sets of principles exists.
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47 **5. Conclusion and Implications for Theory and Practice**

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49 As an industrial model proposing to reintegrate economy within ecology, the CE has made
50 inroads into many public domains recently. However, the CE literature while growing
51 substantially, still lacks conceptual and paradigmatic clarity and limited is the contribution
52 from management studies.
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3 Therefore, this article was constructed around two research questions: i) *how can the CE*
4 *be conceptualised to address current definitional shortcomings and advance its understanding*
5 *from a management studies perspective?* And, ii) *how can CE paradigmatic anchoring in*
6 *management studies be established?* By critically evaluating CE definitions, principles and
7 characteristics, this article brought to the attention competitiveness and systemic aspects
8 pertaining to the CE, which are almost neglected in how the CE is conceptualised in scholarly
9 literature. The contribution of this conceptualisation extends beyond current academic
10 literature because this enquiry incorporates how the CE relates to competitiveness and
11 profitability, which is of relevance to management practitioners.
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26 The rise of the Anthropocene, a new geological epoch in which human impact on planet
27 Earth has reached levels never met before modifying many of its eco-systems (Crutzen and
28 Stoermer, 2000), poses substantial challenges for the future prosperity of humanity.
29 Management scholars are not exempt from the intellectual task of identifying organisational
30 frames and instruments that can encourage corporate strategies safeguarding rather than
31 threatening planetary limits. The quest for management research that is more aligned to
32 ecological thinking started in the 1990s but it has remained mostly unheard. Yet the scale of
33 the ecological crisis and its consequences for sustaining production and consumption systems
34 in the long term cannot be overlooked further. Ignoring physical materiality in the context of
35 management research is no longer an option (Bansal and Knox-Hayes, 2013). As put by
36 Whiteman *et al.* (2013), “it is time for corporate sustainability scholars to reconsider the
37 ecological and systemic foundations for sustainability” (p. 307).
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56 As a response to this challenge, this article has stressed the importance of establishing
57 some paradigmatic anchoring of the CE concept and has identified in Sustaincentrism a suitable
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3 environmental paradigm for this purpose. This step is crucial to provide some transparency in
4 terms of philosophical assumptions, a precursor to guarantee scientific development in a
5 particular field (Vildåsen *et al.*, 2017). In fact, once paradigmatic clarity has been defined,
6 theoretical building and development can take place. It is left to future enquiries the task to
7 assess whether the most frequently used theories in the study of corporate sustainability are
8 consistent with the principles in Sustaincentrism and CE thinking. In the Anthropocene,
9 sustainable development is “development that meets the needs of the present while
10 safeguarding Earth’s life-supporting system, on which the welfare of current and future
11 generations depends” (Griggs *et al.*, 2013: 306). Under these circumstances, businesses are
12 required not simply to reduce their environmental impact but, more importantly, to transform
13 the system within which they operate through innovative business models that produce
14 environmental and social sustainability (Bolton and Hannon, 2016; Proka *et al.*, 2018).
15 Therefore, in addition to its academic relevance, Sustaincentrism in management research can
16 be appropriate to inform current management practice and steer the emergence of innovative
17 circular strategies.

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40 To conclude, this article has opened up the way for more integration between CE and
41 management literature. The relevance of this cross-fertilisation is going to grow significantly
42 in the years ahead. Therefore, it is hoped that this article succeeds in encouraging
43 complementary work between management studies and CE scholars.

44 45 46 47 48 49 50 51 **6. Limitations and Future Research**

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53 Based on academic and practitioners’ literature, this article has emphasised opportunities for
54 enhanced competitiveness and profitability deriving from circular business model innovation.
55 However, this connection requires further research. The CE to date is far from reaching its full
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3 potential and so some caution should be used in approaching the conceptualisation presented
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5 here. Future research could test the strength of the relationship existing between
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7 competitiveness and circular business models through detailed qualitative case studies, and
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9 thereby advancing the relatively little empirical evidence of successful circular cases
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11 (Hopkinson *et al.*, 2018; Velenturf *et al.*, 2019) and the limited research on circular business
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13 models (Lüdeke-Freund *et al.*, 2019). Conceptual studies about circular business models would
14
15 also be beneficial to aid conceptual development and practical implementation given that how
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17 they can be defined and implemented needs still attention (Urbinati *et al.*, 2019). In addition to
18
19 the study of the economic performances of circular corporate strategies, future studies could
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21 investigate the still contested aspect of the environmental benefits of end-of-life materials
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23 recovery strategies in a CE such as recycling (Helander *et al.*, 2019; Olsen, 2019) and develop
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25 a set of indicators to assess progress towards the implementation of the CE (Howard *et al.*,
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27 2019) and the performances of the circular model on a macro scale (Mayer *et al.*, 2019).
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35 **End Notes**

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40 ¹[See for instance, the special issue 'Strategy: The Search for New Paradigms' published in *The Strategic*
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42 *Management Journal* in 1994 and particularly Prahalad and Hamel (1994a) and also the 1995's *Special Topic*
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44 *Forum on Ecologically Sustainable Organisations* in *The Academy of Management Review* (e.g., Gladwin *et al.*,
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46 1995; Starik and Rands, 1995)].
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