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Analysis

Barriers to the Circular Economy: Evidence From the European Union (EU)

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ABSTRACT

The circular economy concept is much discussed in the European Union (EU), but only limited progress has been accomplished so far regarding its implementation. Most scholarly studies blame this on various technological barriers. Our work rebuts these studies. We present the first large-N-study on circular economy barriers in the EU (208 survey respondents, 47 expert interviews). We find that cultural barriers, particularly a lack of consumer interest and awareness as well as a hesitant company culture, are considered the main circular economy barriers by businesses and policy-makers. These are driven by market barriers which, in turn, are induced by a lack of synergistic governmental interventions to accelerate the transition towards a circular economy. Meanwhile, not a single technological barrier is ranked among the most pressing circular economy barriers, according to our research. Overall, our work suggests that circular economy is a niche discussion among sustainable development professionals at this stage. Significant efforts need to be undertaken for the concept to maintain its momentum.

1. Introduction

The circular economy (CE) is a contested concept (Skene, 2017; Korhonen et al., 2018). A recent meta-definition which is based on an analysis of 114 definitions of the term reads: "A [CE] describes an economic system that is based on business models which replace the 'end-of-life' concept with reducing, alternatively reusing, [and] recycling […] materials in production/distribution and consumption processes, […], 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" (Kirchherr et al., 2017, pp.224–225). We adopt this (abridged) CE definition for this paper.

The CE is receiving increasing attention in the popular as well as scholarly discourse as indicated, inter alia, by the exponential growth of both practitioner and scholarly writings on the topic (D'Amato et al., 2017; Murray et al., 2017). However, the core ideas of the CE concept have already emerged in the 1960s (e.g. Boulding, 1966) and have been further discussed throughout the 1970s and beyond (e.g. Stahel, 1981) (Blomsma and Brennan, 2017). Much of the current enthusiasm regarding the CE seems to be fueled by its alleged benefits for sustainable development (Homrich et al., 2017; Bocken et al., 2016). For instance, the CE could reduce CO_2 emissions by 48%, create a net economic benefit of EUR 1.8 trillion, and two million additional jobs until 2030 in the European Union (EU) (Ellen MacArthur Foundation, 2015; European Commission, 2014a).

While many in business and policy circles have proclaimed their support for the CE (European Commission, 2008; Lacy and Rutqvist, 2016), its implementation still appears to be in the early stages (Ghisellini et al., 2016; Stahel, 2016). China may be the only notable exception. The country adopted its 'Circular Economy Promotion Law of the People's Republic of China' in 2009 and has been at the forefront of CE implementation ever since (Geissdoerfer et al., 2017; Geng et al., 2013; Lieder and Rashid, 2016; Liu and Bai, 2014), although it is arguably still far away from achieving what Dijksma & Kamp (2016, p.23) call "full circularity". Some also see The Netherlands as a frontrunner regarding the CE (van Buren et al., 2016; Bastein et al., 2013).

Scholars have attributed the limited progress in CE implementation to a variety of CE barriers with a specific literature having developed around CE barriers in recent years (e.g. Pheifer, 2017; Shahbazi et al., 2016; Rizos et al., 2015; Preston, 2012; de Jesus and Mendonça, 2018; Vanner et al., 2014; Ranta et al., 2017; van Eijk, 2015; Mont et al., 2017; further discussed in Section 3). The most notable recent contribution to this literature may be de Jesus and Mendonça (2018), published in this very journal. de Jesus and Mendonça (2018) aggregate previous findings regarding CE barriers with the intention to develop a CE barriers framework. The authors close their study by noting that their "CE [barriers] framework requires more empirical content" (de

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Jesus and Mendonça, 2018, p.85). This is the point of departure for our work.

The research question answered in this study is: What are the main barriers that derail or slow down the transition towards a CE in the EU? We chose the EU as our regional focus since the European Commission (EC) has adopted a variety of ambitious CE policies, e.g. its 'Circular Economy Package' (launched in 2015 and later updated in 2018) with a focus on closing the loop of product lifecycles through greater re-use and recycling (European Commission, 2015, 2018; Lazarevic and Valve, 2017). Despite the adoption of these policy measures, most EU Member States are said to have seen limited CE implementation so far (McDowall et al., 2017; Stahel, 2014). Therefore, to answer our research question and provide insights for future CE policy development, we present the first large-N-study on CE barriers to date, as far as we are aware. For this, we conducted 47 interviews with CE experts, supplemented by a survey with 208 stakeholders from businesses and governments in the EU.

While the previous literature on this topic particularly emphasized technical barriers as key barriers for CE implementation, various cultural barriers appear as main barriers in our work. The two core cultural barriers identified are 'lacking consumer interest and awareness' as well as 'hesitant company culture'. This finding suggests that the CE may still be a niche discussion among sustainable development professionals, despite the increasing attention received by the concept in recent years. Furthermore, our work suggests that an intervention strategy is needed that does not focus on research and development (R&D) for CE any longer. Overall, this study may serve as a warning for those who think that the current high interest in the CE may automatically translate into CE implementation successes.

The remainder of this paper is organized as follows. We discuss our material and methods in the next section. We then outline our theoretical framing. Results are presented and discussed in Section 4, while our argument is summarized in Section 5.

2. Material and Methods

Data collection for this paper has been undertaken throughout 2017. This entailed three components: desk research, semi-structured interviews and a survey. Interviewees and survey respondents were from all over the EU, e.g. Belgium, Germany, the Netherlands, Portugal, Sweden and the United Kingdom.

Desk research started by undertaking searches in Elsevier's Scopus, Thomson Reuters' Web of Science and Google with the keywords 'circular economy' and 'barriers' (as well as 'circular economy' in combination with several synonyms of barriers, e.g. 'obstacles' or 'hindrances'). We included Google as a search engine since the scholarly literature on the CE has been significantly shaped by practitioner writings, with the latter thus constituting a core component of the CE literature (Blomsma and Brennan, 2017; Schut et al., 2015). We examined bibliographies of identified relevant studies, e.g. de Jesus and Mendonça (2018), Shahbazi et al. (2016) Rizos et al. (2015), to identify further relevant literature. Overall, more than 30 studies on CE barriers were identified. These were reviewed by the authors of this paper to develop a foundational understanding regarding CE barriers. Based on this, an initial coding framework regarding CE barriers was developed, which aided the first round of analyses of the semi-structured interviews carried out.

Semi-structured interviews were conducted for this work with experts on the CE (Table 1). We talked to businesses, policy-makers and academics since the CE has been argued to be a "multi-actor [concept]" (de Jesus and Mendonça, 2018, p.85) with these groups widely seen as those at the forefront of the transition towards a CE (Lieder and Rashid, 2016; Bocken et al., 2016). We built a judgement sample for this work, which is a non-random sample of respondents selected by the researchers based on to their knowledge on the topic under investigation (Marshall, 1996; Kirchherr, 2018). First, we created a list of 195 CE experts in the EU and reached out to all of them, which resulted in 40 interviews (success rate: 20.5%). Second, we complemented this list by snowball sampling (Handcock and Gile, 2011) to also leverage the insights of our interviewees about CE experts. For this, we asked each interviewee to indicate suitable additional interviewees. This produced 11 novel referrals, which, in turn, resulted in 7 more interviews (success rate: 63.6%). Before conducting the interviews, an interview guide was designed with questions aimed at probing the familiarity of each interviewee with the CE concept, perceived barriers to CE implementation and possible ways to overcome them. Interviews lasted between 45 and 60 min on average and were carried out face-to-face as well as via telephone and Skype. Anonymity was ensured since we believe that this approach helped us gain more trust and, thus, obtain additional insights regarding CE barriers (Berry, 2002; Kirchherr et al., 2017). We provide selected details regarding interviewees whenever possible. All interviews were coded by two authors of this paper based on the mentioned initial coding framework. This framework was further refined using the results of the semi-structured interviews. The eventual coding framework is depicted in Table 2 and further described in Section 3.

Table 1
Overview of interviews.

#	Position	Organization	Type
1	Chief Executive Officer (CEO)	Circular start-up	Business
2	Managing Director	Circular start-up	Business
3	Chief Executive Officer (CEO)	Circular start-up	Business
4	Co-founder	Circular start-up	Business
5	Manager (Sales)	Circular start-up	Business
6	Managing Director	SME	Business
7	Manager (Environmental Affairs)	SME	Business
8	Managing Director	SME	Business
9	Manager	Incumbent	Business
10	Sustainability Director	Incumbent	Business
11	Manager (Business Intelligence and Innovation)	Incumbent	Business
12	Manager (Sustainability)	Incumbent	Business
13	Advisor (Business Development)	Incumbent	Business
14	Head of Health, Safety, Security & Environment	Incumbent	Business
15	Advisor (Sustainability)	Incumbent	Business
16	Managing Director	Incumbent	Business
17	Manager	Incumbent	Business
18	Scholar	University	Academia
19	Scholar	Research institute	Academia
20	Scholar	University	Academia
21	Scholar	University	Academia
22	Founder	Research institute	Academia
23	Scholar	Research institute	Academia
24	Scholar	Research institute	Academia
25	Scholar	Research institute	Academia
26	Scholar	University	Academia
27	Scholar	University	Academia
28	Scholar	University	Academia
29	Scholar	University	Academia
30	Scholar	University	Academia
31	Director	Research institute	Academia
32	Director	Research institute	Academia
33	Policy-maker	County government	Government
34	Policy-maker	County government	Government
35	Program Manager (Circular Economy)	County government	Government
36	Advisor (Circular Economy)	County government	Government
37	Policy-maker	Country government	Government
38	Program Leader	Country government	Government
39	Program Manager	Country government	Government
40	Advisor (Sustainability)	Country government	Government
41	Project Manager	Government council	Government
42	Policy-maker	European Commission	Government
43	Advisor (Circular Procurement)	National government	Government
44	Advisor (Innovation)	National government	Government
45	Policy-maker	National government	Government
46	Program Manager	City government	Government
47	Project Leader	National government	Government