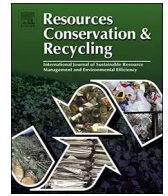




Contents lists available at ScienceDirect

Resources, Conservation & Recycling

journal homepage: www.elsevier.com/locate/resconrec

Full length article

Exploring institutional drivers and barriers of the circular economy: A cross-regional comparison of China, the US, and Europe

Valtteri Ranta^{a,*}, Leena Aarikka-Stenroos^a, Paavo Ritala^b, Saku J. Mäkinen^a^a Tampere University of Technology, Laboratory of Industrial and Information Management, PO Box 527, FI-33101, Tampere, Finland^b Lappeenranta University of Technology, School of Business and Management, PO Box 20, FI-53851, Lappeenranta, Finland

ARTICLE INFO

Keywords:

Circular economy
Institutional theory
Regulation
Norm
Cultural-cognitive
Case study

ABSTRACT

The Circular Economy (CE) has been identified as a sustainable alternative to the current linear economic model. Thus far, research on the circular economy has focused on methods for better conserving the value in material flows. As the CE is currently being adopted as a sustainable development strategy in, e.g., China and the EU, identifying and comparing the drivers of and barriers to CE implementation would be beneficial for the acceleration of the development path. To contribute toward this research area, we built on institutional theory via a multiple case study covering China, the US, and Europe. We analyzed each region as an institutional environment and considered manufacturer and integrator types of value chain actors due to their central role in CE implementation. As our key findings, we identified that the general drivers of the CE from each institutional environment support recycling as the primary CE action, while support for other CE types appears to be lacking. Regulatory measures have primarily driven increased recycling efforts on both the integrator and manufacturer sides. Similarly, identified normative indicators overwhelmingly point toward recycling, while increasing reuse faces cultural-cognitive barriers. Between regions, China differs due to its informal sector and strong regulative institutional support. We conclude that to improve institutional support for the CE and allow it to fulfill its potential as a sustainable growth model, diversified institutional support for reducing the products produced and materials used as well as increasing reuse are needed.

1. Introduction

The Circular Economy (CE) approach refers to an economic system that is designed to be restorative and generative (Charonis, 2012); more specifically, the system maintains the value of products, materials, and resources in the economy for as long as possible, and the generation of waste is thereby minimized (European Commission, 2015). Accordingly, the CE approach has been receiving increasing attention recently as a step toward a more sustainable economic model. The CE theory suggests that increasing resource efficiency and waste reduction throughout the lifecycle of produced goods are, in fact, unexplored economic opportunities that have the potential for economic growth (Ghisellini et al., 2016; Witjes and Lozano, 2016). This fundamental linkage between environmental sustainability and economic potential has generated major interest in CE initiatives on a global scale (European Commission, 2015; Gang et al., 2012; Mathews and Tan, 2011).

Successful CE initiatives typically involve a broad variety of economic and societal stakeholders that need to work together in order to

enable the circular flow of materials and related efficiency benefits (Geng et al., 2012; Preston et al., 2012). In particular, the literature has shown that implemented CE initiatives have often needed societal support, including legislative and financial subsidies (Fei et al., 2016; Levänen, 2015). Furthermore, recent research has increasingly highlighted the role of broader institutional issues such as norms and cultural aspects in shaping the transition toward more sustainable choices and the adoption of CE principles (Dai et al., 2015; Dubey et al., 2016; Levänen, 2015). However, the major focus of the CE literature has been on technical issues, such as material flows and technologies (Geng et al., 2009; Mathews and Tan, 2011), and thus the concept has been criticized for largely excluding the societal factors of sustainability (Murray et al., 2015).

Given the relevance of societal factors for CE adoption, we argue that the absence of an understanding of institutional drivers and barriers in mainstream CE analyses constitutes an important research gap. Although the extant studies have shown that diverse social institutions and legitimacy are relevant aspects of the transition to a CE (Ghisellini et al., 2016; Murray et al., 2015), our understanding of how these

* Corresponding author.

E-mail addresses: valtteri.ranta@tut.fi (V. Ranta), leena.aarikka-stenroos@tut.fi (L. Aarikka-Stenroos), ritala@lut.fi (P. Ritala), saku.makinen@tut.fi (S.J. Mäkinen).<http://dx.doi.org/10.1016/j.resconrec.2017.08.017>Received 30 December 2016; Received in revised form 18 August 2017; Accepted 23 August 2017
0921-3449/ © 2017 Elsevier B.V. All rights reserved.

factors form the initiatives and drivers of as well as barriers to the CE are limited. The CE is an emerging global phenomenon, as China and the EU have simultaneously adopted it as a concept around which economically and environmentally effective future policy can be built (European Commission, 2015; Mathews and Tan, 2011). However, existing studies have focused mostly on single regions (e.g., Su et al., 2013) or have been limited to narrow sets of institutions, such as legislation (e.g., Sakai et al., 2011); thus, cross-regional comparisons that would suggest variations or offer a comprehensive picture of the phenomenon at a global level are needed. Furthermore, a multitude of viewpoints exist about how to actually incorporate the CE into concrete actions at the firm level. The definition provided by the EU Commission (2015) gives very little direction toward concrete operations and, academically, the concept is rooted in industrial ecology (Yuan et al., 2006), industrial symbiosis (Geng et al., 2012), product-service systems (Tukker, 2015), remanufacturing (Linder and Williander, 2015), corporate responsibility (Murray et al., 2015), and sharing economy (Preston, 2012), just to name a few. However, comprehension of the general drivers of and barriers to CE is very limited, possibly due to the fragmentation of the field. We argue that the principal difference between the linear economy and the CE is that, in the latter, material flows are integrated back into circulation. Following the established value chain perspective of Porter and Millar (1985), the critical actors in enabling the transition to the CE would thus be integrators, i.e., actors integrating material flows back into circulation; and manufacturers, i.e., actors completing the integration by enabling new value cycles from material flows.

Thereby, we analyze the general and region-specific institutional drivers of and barriers to CE initiatives across China, the US, and Europe as found in manufacturer and integrator companies. To contribute to the above-mentioned research gap, we adopt an explicitly institutional view. We build on studies that have examined how CE approaches are shaped by norms and cultural aspects (Dai et al., 2015; Dubey et al., 2016; Levänen, 2015) and utilize institutional theory (DiMaggio, 1997; North, 1990; Scott, 2008) to help us analyze the (institutional) legitimacy of technologies (see, e.g., Markard et al., 2016). Applying the framework of regulative, normative, and cultural-cognitive institutional pillars of Scott (2008) enables us to map in detail how different types of institutional indicators (e.g., laws, norms, and beliefs) hinder or advance the adoption of the CE approach. The empirical part of the study presents a multiple case study approach with insights from Chinese, US, and European CE initiatives, analyzing each region as a different institutional environment (see, e.g., Tatoglu et al., 2015) and highlighting industrial cases of CE application across regions. As our key contribution, we identify regulative, normative, and cultural-cognitive institutional drivers of and barriers to CE across regions and value chain roles and map regional difference and similarities. Taken together, our results provide valuable insights into both academic and practical understandings of the heterogeneous institutional environments for CE implementation.

The structure of the study is as follows. Section 2, the theoretical background of the research, includes a discussion of circular economy and institutional theory. Section 3 presents the research methodology and describes the case selection, data gathering and data analysis procedures used. In Section 4, the findings from the case analysis are shown and summarized. In Section 5, the findings are further discussed by comparing the findings and identifying region and case-type specific drivers and barriers. In the concluding section, the implications of the findings, the limitations of the study and potential future research avenues are discussed.

2. Theoretical background

2.1. Identifying circular economy initiatives

The CE has been receiving increasing attention from academia

(Ghisellini et al., 2016), governments (e.g., the EC Working Package, China's CE Promotion Law), and companies (Ellen MacArthur Foundation, 2016) as an alternative to the prevailing model of economic development: the so-called "linear economy" (Andersen, 2007), otherwise known as the "take, make and dispose" model (Ness, 2008).

The CE is often discussed through the 3R principles: reduce, reuse, and recycle (Feng and Yan, 2007; Preston, 2012; Reh, 2013; Sakai et al., 2011; Su et al., 2013; Yong, 2007). The reduce principle implies using minimal inputs of energy, raw materials, and waste by, for example, implementing better technologies, simplifying packaging, and using more power-efficient appliances (Feng and Yan, 2007; Su et al., 2013). The reuse principle states that "products or components that are not waste are used again for the same purpose for which they were conceived" (The European Parliament and the Council of the European Union, 2008, p. 10); this principle refers to the use of fewer resources, less energy, and less labor than that required to produce new products from virgin materials or even to recycle and dispose of products (Castellani et al., 2015). The recycling principle refers to "any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and reprocessing into materials that are to be used as fuels or for backfilling operations" (The European Parliament and the Council of the European Union, 2008, p. 10). Recycling is often discussed almost synonymously with the CE, and waste policies have included a strong focus on improving recycling rates (see, e.g., The European Parliament and the Council of the European Union, 2008). Since the 3R principles capture the essential aspects of the CE, we have determined its institutional drivers and barriers by analyzing whether they support or inhibit the 3R principles.

The 3R principles and the implications for advancing them demonstrate that the manufacturing and waste management sectors are central industries in the CE. However, the sectors have differing attitudes toward 3R principles due to their position in the value chain. In the traditional value chain perspective (Porter and Millar, 1985), product manufacturers produce goods and products, while waste management (i.e., integrator) companies deal with their disposal. In a profit-maximizing logic, reduce, reuse, and recycle have different impacts on actors in different parts of the value chain. Manufacturers that implement CE initiatives which fulfill some or all parts of the 3R principles seek benefits in terms of competitive advantage, albeit indirectly, in, e.g., increased efficiencies (Knight and Jenkins, 2009). The reduce principle is well aligned with this approach (Ayres and Van Den Bergh, 2005, p. 102), but designing and organizing reuse and recycling are not (Knight and Jenkins, 2009). In contrast, integrators, or waste management companies, seek to improve their processes with CE initiatives and direct business benefits, as they are structured in line with the 3R principles and thus have less conflicting business goals (Geng et al., 2009). For example, recycling is one of the central processes in an integrator's business, while for a manufacturer this represents an additional set of costs that need to be turned into competitive advantage, e.g., by actively communicating its efforts to relevant markets as a responsible business practice (Bocken et al., 2014).

2.2. Institutional theory and the legitimization of sustainability initiatives

Since our work builds on institutional theory, we begin by briefly discussing the key aspects of this approach. Institutional theory examines the established, resilient social structures that provide societal stability (Scott, 1987). Scott's (2008) framework of institutional theory suggests separating institutions into three pillars—*regulative*, *normative*, and *cultural-cognitive*—that are individually distinguishable but inter-dependently contribute to the resilience of the social structure. These pillars reveal through their indicators the rules, norms, and beliefs that impact social behavior and are reflected in activities, relations, and resources in a particular field, region, or community (Scott, 2008).

Download English Version:

<https://daneshyari.com/en/article/7494002>

Download Persian Version:

<https://daneshyari.com/article/7494002>

[Daneshyari.com](https://daneshyari.com)