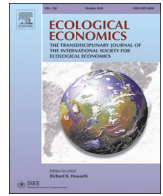




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Analysis

Modelling the Interplay Between Institutions and Circular Economy Business Models: A Case Study of Battery Recycling in Finland and Chile

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ABSTRACT

This article develops an analytical framework for modelling the complex interactions between circular economy business model activities and the features of diverse institutional operating environments. Developed framework combines business model conceptualization with institutional theorization to understand how institutions influence on business conduct. Business model concept is used to describe organizational activities and managerial cognition in a structured manner and institutional theory is used to identify features that may facilitate or hamper particular activities in a particular operational environment. Countries' institutional environments related to the advancement of circular economy differ from each other and therefore comparison between the situations provides an interesting context to study the dynamics between companies' business models and the institutional features. We apply our analytical framework to a case study of two recycling companies operating in Finland and Chile to explore links between the firm-level activities and developments outside the firm. The results highlight the interdependent nature of the relationship between the business models and context-specific institutions, the logics between positive and negative value materials, and the differences between countries in the promotion of circular economy.

1. Introduction

The implications of institutions on the advancement of circular economy has been studied at the level of entire business environments (e.g. Pajunen et al., 2013; Ranta et al., 2018) but only few studies have paid attention to the close interdependence between institutional frameworks and single companies' business models (e.g. Fischer and Pascucci, 2017; Moreau et al., 2017). In this article, we develop a framework for modelling how institutional conditions influence circular economy business models of battery recycling companies. We argue that combining business model concept with institutional theorization can help to understand how institutions influence on the activities and opportunities of a particular company. This notion adds to the literature because institutional theory has paid only little attention to companies' resources and capabilities, concentrating instead on the rules and regulations in place in different operational environments. It can be said that thus far institutional theory has black-boxed the role of business models and consequently there is little evidence on how specific institutional factors influence on firm-level business activities.

The transition from a traditional, linear economic model to circular economy is motivated and driven by the goal of improved resource

efficiency (Ghisellini et al., 2016; Korhonen et al., 2018). Since the earliest stages of ecological economics, the basic idea of circular economy – i.e. continuous reuse of resources – has been central to the field. In 1991 Herman E. Daly noted in his essay a problem that “circular flow of exchange is coupled with a physical flow of matter-energy which is *not* circular” (Daly, 1991, 195). Even much earlier Kenneth Boulding had used spaceship-metaphor to describe “a closed system” in which “all outputs from consumption would constantly become inputs for production” (Boulding, 1966, 7) and Nicholas Georgescu-Roegen had brought into discussion the ultimate limits of the use of natural resources (Georgescu-Roegen, 1971). The term ‘circular economy’ was first used by David W. Pearce and R. Kerry Turner in their now-classic book *Economics of Natural Resources and the Environment* (Pearce and Turner, 1990, 35–40). These early ideas have not only been instrumental to the development of ecological economics as a field of research, and later circular economy as a concept; they have also inspired the development of many other concepts and fields, including for example industrial ecology (Frosch and Gallopoulos, 1989) and cradle-to-cradle design (Braungart and McDonough, 2002).

Today, national governments are promoting circular economy by introducing new laws and regulations, but differences in priorities

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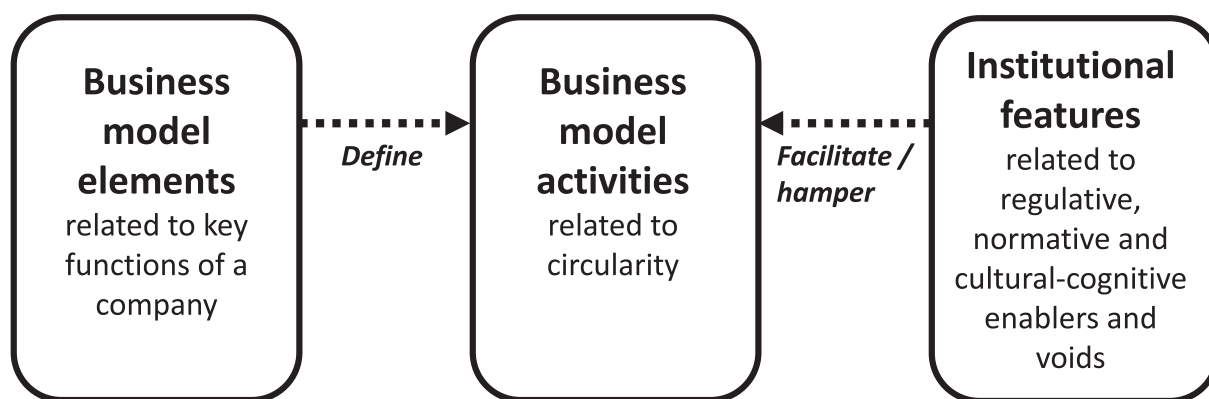


Fig. 1. Analytical framework for modelling the interplay between institutions and circular economy business models.

mean that these changes are happening at a different pace in different countries. The transition to circular economy unfolds through a succession of modifications to the national institutional frameworks and to companies' business models (Boons and Lüdeke-Freund, 2013; Lewandowski, 2016). In this article, we focus on situations in which the advancement of circular economy requires both institutional changes and an ability on the part of companies to adapt and adjust to those changes. Our analysis demonstrates that in different locations institutions influence in different ways on business models of the companies. Our study suggests that business models must always be weighed against the local institutional structure, which constitutes context-specific institutional enablers and voids for business activities. Our findings are informative beyond the studied industry of battery recycling because they shed new light on the mental models operating behind firm-level activities and institutional-level features as well as complex interactions between institutional contexts and businesses' attempts to move toward circularity.

Motivated by the observation that the specific dynamics between business models and the institutional environments are not well understood in the context of circular economy, we pose the following research question: how do institutional features facilitate and/or hamper the circular economy business model activities? In the forthcoming, we will develop an analytical framework for modelling the institutional influences on companies' business models and we will demonstrate the success of the model with the analysis of two recycling companies operating in very different institutional environments of Finland and Chile.

2. Literature on Institutions and Business Models

The environment in which companies operate is characterized by the prevailing socio-cultural institutional structure. By institutional structure, we refer to the “rules of the game in a society” (North, 1990, 3), or a system of rules comprising formally and informally defined institutions (e.g. Ostrom, 2005) that determines what actors are allowed to do and what not (Bocken et al., 2014, 55). Based on their different working mechanisms, institutions can be divided in three broad categories of regulative, normative and cultural-cognitive institutions (Scott, 2013, 59–70). Regulative institutions, such as laws and regulations, are formally defined coercive rules. Normative institutions, such as routines and ways of doing things, are rules that are based on social obligation. Cultural-cognitive institutions, such as shared beliefs and logics of action, are constitutive schemas that operate mainly through mimetic processes. Different types of institutions operate in a reciprocal relationship and their mutual significance varies depending on the context and the situation at hand (e.g. Levänen, 2015a).

We argue that the concept of business model can be used as an analytical tool for structured analysis of how companies' activities are influenced by regulative, normative and cultural-cognitive institutions.

In this study business model is not seen as a theory on its own (Ritter and Lettl, 2017), but as a conceptual representation of firm-level organizational activities (Massa et al., 2017; Zott and Amit, 2010). Theoretical foundation of the business model concept is built on transaction-cost economics, resource-based view and dynamic capabilities (Barney et al., 2001; DaSilva and Trkman, 2014; Williamson, 1981; Zott et al., 2011). The concept provides a structured approach to model organizational activities and managerial cognition (Baden-Fuller and Morgan, 2010; Martins et al., 2015). This kind of modelling helps to understand causal links between the firm-level activities and developments outside the firm (Baden-Fuller and Mangematin, 2013). Importantly, business model conceptualization can be used in the analysis of single firm's responses to exogenous shocks, such as institutional changes in the operating environment (Osterwalder et al., 2005; Teece, 2010, 191). We use business model concept to describe how institutional influences take place at firm-level.

When institutions are understood in terms of a set of rules, the operating environment as a whole can be seen as a “game”, and a business model accordingly as a company's “game plan” or a story of how it aims to play the game, i.e. how it conducts its business in that particular environment (Magretta, 2002). By adjusting its activities in relation to the elements of a business model, a firm can adapt to the institutional structure. When the “rules of the game” (the institutional framework) for a recycling business change, companies need a new “game plan” (business model) in order to benefit from or at least adjust to the new situation, which may require a revision of the entire business logic. Companies' capacity to adjust to institutional changes becomes critically important in the context of circular economy because countries typically pursue advancement at that area by modifying their institutional frameworks. It is important to notice, however, that no institutional environment is an optimal “game” for all “players.” Rather, the institutional structure is always imperfect, and therefore companies must constantly adjust their business model activities to fit the current expectations of the institutional environment.

Based on the theoretical premises outlined above, we have developed an analytical framework (Fig. 1) for modelling the relevance and applicability of a particular business model to a particular institutional environment in the context of advancement of circular economy. The idea of our analytical framework is that it can be used in the modelling of the interplay between institutions and circular economy business models in different contexts. This is possible because an analyst can include in the modelling context-specific business model elements and circular economy features that are critical from the perspective of applied industry. Detailed instructions for applying the framework in different contexts as well as a description about how we utilized it in our research are presented in Appendix A.

Here developed analytical framework helps to identify: 1) business model elements that are critical from the perspective of advancement of circular economy, 2) activities taking place in relation to each business

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