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Contribution for the circular economy

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Fokus area A: Conceptual

Sustainable business models: Contribution for the circular economy

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Abstract

Sustainable business models are increasingly necessary. However, they involve challenges to business modelling, value mapping, and the fit between business models and their contexts, especially in the present surge of industry 4.0. The understanding of how business models, networks and dynamic capabilities co-evolve is both challenging and of the essence.

Key words

Sustainable business models, circular economy, industry 4.0

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Introduction

While the scholarly debate on sustainable business models is still in its infancy, the importance of the outcome of that debate is nevertheless increasing. The depletion of the natural resources on planet Earth is growing at an accelerated rate, because the natural creation and recreation of resources are increasingly lacking behind the consumption of resources. Although estimates of that relation are subject to uncertainties, there seems to be widespread acceptance of the fact that an unbalanced relation exists, most vividly displayed in the annual announcement of the *Earth Overshoot Day* that marks the date where the human demand on resources exceeds what the planet can regenerate (www.overshootday.org). The overshoot that is measured as the proportion of ecological footprint to global bio capacity per person varies, of course, from country to country, but the trend seems to be that the overshoot day occurs earlier and earlier. According to this measure, we would need three more planets for extraction of resources if all humans enjoyed the same lifestyle as for instance Danes and North Americans.

The resource imbalance has stimulated criticism of the dominant paradigm in economics, i.e. the neoclassical synthesis (Samuelson, 1955) and its subsequent refinement (Goodfriend & King, 1997), and lead to new concepts like *the circular economy* (Webster, 2015) and *doughnut economics* (Raworth, 2017). The criticism is inspired by the idea that it is possible to define resilient threshold boundaries within which non-depleting anthropogenic activities can take place (Rockström et al., 2009), and that it consequently is possible to point out that some boundaries have been overstepped and some are about to be trespassed. The concept of a circular economy has become part of a political discourse of seeking solutions to environmental challenges that could be market-driven and supported by various policy schemes (Milios, 2017). Furthermore, it has led to the idea that current technological progress can assist the development of an inclusive bio-economy where economic activities mimic natural functions and processes, including replication of bio-chemicals and bio-materials (World Economic Forum, 2018).

The exploitation of current technological progress in order to push planetary boundaries is an intricate matter for business. It requires that firms and stakeholders rethink their way of doing business and perceive themselves as partners in a wider planetary effort. The following section contemplates on how this affects the way in which business models and business model innovation are conceptualized.

Approach

The scholarly debate on how business models can be redefined and redesigned in order to contribute to a circular economy is relatively new, but has increased during the last ten years (Schaltegger, Hansen & Lüdeke-Freund, 2016). Business models oriented towards the circular economy are described

as *sustainable business models*, i.e. business models that include environmentally friendly solutions in the value proposition. This implies a change of the stakeholder perspective that is part of business modelling. Generally, business models are conceptualized from the perspective of a focal firm that interacts with an activity network comprising customers, suppliers and complementors, as described by e.g. Osterwalder & Pigneur (2010) and Baden-Fuller & Mangematin (2013). However, sustainable business models need to take a broader view on the composition of stakeholders, because sustainable growth implies that value is created for environment and society as well as the interacting economic actors (Bocken, Rana & Short, 2015).

Broadening the view on which stakeholders are important to the business model has two important implications. First, the conventional distinction between profit and non-profit economic actors may become blurred because new actors that are not normally associated with market activities may become important in the creation and delivery of value. In an increasing number of cases, sustainable development is pursued by hybrid organizations that combine profit and non-profit motives and organizational behaviour (Porter & Kramer, 2011: 67). Second, as new actors become important partners in business modelling, the process of business modelling becomes embedded in interorganizational arrangements and network activities that are new to the firm and therefore likely to create external dependencies that were not foreseen at the outset of the business modelling process (Rossignoli & Lionzo, 2018). This reflects that business modelling becomes less of a top-down activity and more of a co-evolutionary activity, implying that business models change as new patterns of dependencies evolve through networking (Oskam, Bossink & de Man, 2018).

As argued by Rossignoli & Lionzo (2018: 695) with reference to Van Kleef & Roome (2007) and Lowitt (2013), sustainable business models require that firms develop new skills and capabilities, and that they engage in collaborative activities at a larger scale, because new and diverse types of knowledge need to be integrated. The need to integrate new and diverse types of knowledge may actually increase in the years to come as the present stage of industrial activity transcends into a new phase associated with the affluence of technological achievements, presently known as the fourth technological revolution or industry 4.0. While previous industrial revolutions have been characterised by relatively few core technologies and key factors (Perez, 2010), the present industrial revolution is embedded in a very broad range of core technologies that can be combined in numerous ways within and across dimensions of digitalisation, biotechnology, advanced materials, and advanced energy and resource optimisation (OECD, 2016). The utilisation of these combinations, which involves that activity and value networks are continuously redesigned (Rayna & Striukova, 2016) and that productivity growth increasingly become a collaborative phenomenon (Schuh et al., 2014), is decisive to the circular economy if current standards of living are to be maintained (World Economic Forum, 2018). Whether or not these new technological opportunities are realised through sustainable business

modelling depends on the speed by which new business models are developed. This poses an important challenge to developing a circular economy, because it “takes time for business model innovation to catch up to technological possibilities, perhaps because business models are more context-dependent than technology”, which implies that the development of dynamic capabilities is of the essence (Teece, 2018: 45).

The extent to which the development of sustainable business models will support the circular economy depends on how business models handle resource flows. Essentially, there are two kinds of sustainable business models: Business models that slow down resource depletion, and business models that prevent resource depletion (Bocken et al., 2016). In the case of value propositions embedded in products, the first type will focus on prolonging the life of products, while the second type focus on closed resource loops in the form of complete recycling or mutual use of waste through industrial symbiosis. In both cases, firms need to reach out to a broader network of other firms and organizations in order to achieve the benefits of sustainable business modelling. This implies that firms perceive their dynamic capabilities as a co-evolutionary phenomenon and endow the necessary resources to that end. Evidence indicates that the effort to do so hinges on the ability of the firm to overcome a number of obstacles, notably an organizational culture that is not environmentally friendly or focused, lack of capital, inability to handle administrative burdens, lack of knowledge on the benefits of sustainability, insufficient knowledge on how to pursue technological solutions, and missing support from the supply and demand network (Rizos et al., 2016).

Key insights

From the contemporary debate on sustainable business models and the societal discourse of which it is a part, four major insights can be derived.

First, the ongoing criticism of current macroeconomic thinking and the way in which mainstream macro- and microeconomics is related points to a need of rethinking and revising the basic theoretical foundation of how we understand value proposition, value creation, and value capture and delivery at meso and macro levels. From a planetary point of view, economic modelling presupposes that economic activities take place within a closed system where environmental challenges such as pollution and resource depletion are treated as externalities. There is a need for developing theoretical models that combine economic modelling and planetary boundaries reasoning (Raworth, 2017).

Second, developing sustainable business models require that business modellers rethink their stakeholder network in order to balance the economic, social and environmental dimensions. This implies that new types of value mapping (Bocken, Rana & Short, 2015) becomes part of business modelling,

where the mapping of sources and avenues of value takes a holistic approach to the economic, social and environmental context of business modelling.

Third, sustainable business models implies that the context of business modelling is understood as an open dynamic system where stakeholders from both profit and non-profit sectors interact, and where the composition of stakeholders change as interaction unfolds. This means that business modelling increasingly subjects itself to conditions of problem uncertainty, the solution to which is co-evolution of business models and networks (Rossignoli & Lionzo, 2018).

Fourth, competitive advantage may become more transient because dynamic capabilities tend to depreciate at a higher rate. Sustainable business models in the current context of industrial change imply that new types of knowledge are continuously combined and recombined, and this may create a strategic and managerial paradox due to differential context-dependency across business models and technologies (Teece, 2018). In effect, there is a growing need for improving and innovating dynamic capabilities.

Discussion and conclusions

The scholarly debate on sustainable business models is still in its infancy, and the scientific community needs to do more research in order to validate the challenges that the present paper describes. At present, the concept of sustainable business models may be described as an umbrella construct, i.e. a concept that comprises an increasing number of different phenomena (Hirsch & Levin, 1999). Umbrella constructs reflect that the scientific community is exploring a wide range of phenomena in order to establish new lines of mutual understanding. In order to do so, the umbrella construct must be tested through case studies and the development of taxonomies and typologies from which mutual understandings can emerge and become established as an international research core.

A particularly challenging avenue of future research is the understanding of how increasing problem uncertainty can be handled by the co-evolution of sustainable business models, networks, and dynamic capabilities. Here, inspiration may be derived from how wicked problems are solved in dynamic ecosystems with high stakeholder density, e.g. as in the case of metropolitan innovation ecosystems (Hämäläinen, 2015). This line of research is particularly inspiring in relation to how we should understand the interaction between multiple stakeholders within a system where economic, social and environmental dimensions strive for balance.

In the future, sustainable business models will present firms with economic benefits that can be reaped through new types of business modelling and value mapping. A major challenge of understanding the relationship between system dynamics and dynamic capabilities lie ahead for researchers and managers alike.

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