10.5465/AMBPP.2021.225

CIRCULAR BUSINESS MODELS: ANTECEDENTS, MODERATORS, AND OUTCOMES

FELICITAS PIETRULLA
University of St. Gallen
Dufourstrasse 40, 9000 St. Gallen, Switzerland

KAROLIN FRANKENBERGER
University of St. Gallen

INTRODUCTION

Circular business models (CBM hereafter) are crucial micro-level enablers for environmental corporate sustainability (Geissdoerfer, Savaget, Bocken, & Hultink, 2017) and describe *"how a company creates, captures, and delivers value with the (...) logic designed to improve resource efficiency through contributing to extending useful life of products and parts (...) and closing material loops"* (Nußholz, 2017: 12). Despite the concept's relevance for sustainability and its business promises of 4.5 trillion GDP growth till 2030 (Lacy & Rutqvist, 2015), it so far has been mainly researched from an environmental sciences and industrial ecology perspective (e.g., De Angelis, 2020). It is, therefore, necessary to understand CBMs from an integrated organizational perspective (Urbinati, Chiaroni, & Toletti, 2019). Besides, we also see the need to synthesize CBM related research streams for two academic reasons: Firstly, to combine the complex and previously unlinked legacy domains contributing to the CBM concept like *Circular economy (CE), Corporate Social Responsibility (CSR), Business Model Innovation (BMI)*, and *Ecosystems (ES)*. Secondly, to consolidate the insights from the still relatively young CBM concept into a holistic CBM-framework entailing antecedents, moderators, and outcomes.

Evolution of circular business model research

Schwager and Moser first mentioned the core idea of CBMs in terms of circular value creation in 2006. Accompanied by practitioner-oriented publications, e.g., the Ellen Macarthur Foundation's work on CE (2013), CBMs studies grew exponentially as part of the sustainable BM literature (e.g., Joyce & Paquin, 2016). Current CBM research primarily deals with typologies of CBMs (Geissdoerfer et al., 2020; Lewandowski, 2016), such as reuse, repair, and maintenance models (Lüdeke-Freund, Gold, & Bocken, 2019). While some studies discussed CBMs' effectiveness in terms of (primarily environmental) performance outcomes (e.g., Bocken, Miller and Evans, 2016; Geissdoerfer *et al.*, 2018) and propose first relevant antecedents (e.g., Del Giudice, Chierici, Mazzucchelli, & Fiano, 2020) or other factors impacting CBM implementation (Salvador, Barros, Luz, Piekarski, & de Francisco, 2020), fewer scholars have empirically investigated more intricate associations of moderators (Ranta, Aarikka-Stenroos, & Väisänen, 2021). Overall, CBM publications tend to focus on a specific context with somewhat limited generalizability. An integrative research framework synthesizing accrued knowledge from adjacent domains into one framework of antecedents, moderators, and outcomes of CBMs is missing.

Literature streams related to circular business models

10.5465/AMBPP.2021.225

Scholars of different domains that are closely related to the field of CBMs (Geissdoerfer et al., 2017; Nußholz, 2017) can further inform the discussion of CBMs. We briefly introduce CE, CSR, BM(I), and ES research and review their value for CBM research.

Circular economy. The CE concept arose in the sustainability literature and was coined by the Ellen Macarthur Foundation in 2013, who created the most commonly used CE definition: CE is "an industrial system that is restorative or regenerative by intention and design" (Ellen MacArthur Foundation, 2015). The CE concept has similarities to various other circularity concepts such as industrial ecology (e.g., Graedel & Allenby, 1995), cradle-2-cradle (Mcdonough & Braungart, 2010), and more. For a detailed list and review of similarities and differences of the CE concept and other circular concepts, see Geisendorf and Pietrulla (2018). CE as a final goal is highly relevant to CBM research as it represents the desired environmental outcome of CBM implementation. Hence, CBM typologies are inspired by CE provided principles, e.g., resource circularity or waste elimination (Bocken, de Pauw, Bakker, & van der Grinten, 2016a; Bocken, Short, Rana, & Evans, 2014; Evans et al., 2017; Manninen et al., 2018; Rizos et al., 2016).

Corporate social responsibility. CSR occurs when firms engage in social good activities beyond their interests and legal requirements (e.g., McWilliams, Siegel, & Wright, 2006). The debate on CSR definitions (Jones, 1980) led to the widely cited publication of the "triple bottom line" framework (Elkington, 1998; Slaper, 2011) that differentiated the three Ps, namely People, Planet, and Profit of a sustainability strategy. While CBMs are mainly associated with the planet dimension (Del Baldo & D'Anghela, 2020), the economic pay-offs are historically more central to the CSR debate (e.g., Ambec & Lanoie, 2008; Burke & Logsdon, 1996; Cochran & Wood). The two concepts are nevertheless similar in their goals: Contributing to financial stability while making a positive environmental contribution. Given the advanced level of CSR research compared to the CBM field, understanding the factors influencing the success of (environmental) CSR initiatives can inform the CBM research field to expand its hypothesized relationships.

Business model innovation. BMI research has increased significantly over the last years (see for recent reviews: Massa, Tucci, & Afuah, 2017) and attracted scholars' interest from strategic management (e.g., Casadesus-Masanell and Ricart, 2010), entrepreneurship (e.g., Amit and Zott, 2001), technology management (e.g., Baden-Fuller and Haefliger, 2013) and most recently, sustainability (e.g., Bocken et al., 2014; Diaz Lopez, Bastein, & Tukker, 2019). A BM refers to the firm architecture of value creation, delivery, and capture (e.g., Chesbrough, 2010; Teece, 2010), and BMI explains how firms can develop an architecture that "complements the traditional subjects of process, product, and organizational innovation" (Zott, Amit and Massa, 2011: 1032). BMI for circularity means that BMs will create both economic and environmental value for various stakeholders (Bocken, Schuit, & Kraaijenhagen, 2018; Lüdeke-Freund et al., 2019).

Ecosystems. Defined as "the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize" (Adner, 2017: 40), an ES view on strategy adds value by effectively managing multilateral dependencies (Jacobides, Cennamo, & Gawer, 2018). ES actors are typically complementary and dependent on each other to create value in a systems-level architecture (Adner & Kapoor, 2010; Kapoor, 2018; Kapoor & Lee, 2013). This lens promises a solution to manage the CBM inherent coordination challenge along the supply circle (Bocken, Short, Rana, & Evans, 2013; Mentink, 2014) through ES-specific approaches optimizing transaction cost, revenue sharing contracts among ES actors, and joint innovation (Gomes, Facin, Salerno, & Ikenami, 2018; Granstrand & Holgersson, 2020) for competitive advantage (Clarysse, Wright, Bruneel, & Mahajan, 2014).

10.5465/AMBPP.2021.225

METHODOLOGY

We conducted a literature review based on three-steps: data search, analysis, and reporting (e.g., Denyer & Tranfield, 2009). For data search, we followed other Journal of Management authors' approaches (e.g., Raisch & Birkinshaw, 2008) and identified the top influential studies for each research field (CBM, CE, CSR, BM(I), ES). We searched in premier management journals (e.g., Academy of Management Journal, Administrative Science Quarterly, etc.) and in leading CE journals (e.g., Journal of Cleaner Production, Journal of Industrial Ecology, Sustainability, etc.) and screened these publications' titles and abstracts for two relevancy criteria (Jacsó, 2005): Firstly, studies must deal with the respective concept in an essential way. Secondly, studies must entail conceptual contributions, informing about related variables. After applying the backward- and forward snowballing technique (Wohlin, 2014) and screening, we developed our CBM framework through content analysis.

RESULTS - A COMPREHENSIVE RESEARCH FRAMEWORK

The majority of the related domains' articles present structural or process-related antecedents and discuss firm or environmental outcomes. Insights on more complex environmental or other moderating factors are relatively scarce. Complementing existing CBM literature, these articles provide promising propositions of how firms can build adequate CBMs (Geissdoerfer et al., 2020; Pieroni, McAloone, & Pigosso, 2019). Within this shortened proceedings version of this article, the following selectively describes antecedents, moderators, and outcomes.

Research on organizational antecedents of circular business models

Which conditions can corporations influence internally to enhance CBM development? Scholars have identified various barriers, such as high investment cost or mindset issues (Ghisellini, Ripa, & Ulgiati, 2018; Guldmann & Huulgaard, 2020; Rizos et al., 2016; Tura et al., 2019; Vermunt, Negro, Verweij, Kuppens, & Hekkert, 2019). Its catalysts are top management attention, values, process, and features, as well as structure. We explain the first two elements in the following:

Top management attention. The literature agrees that a communicated vision through visionary leadership (e.g., de Luque et al., 2008) focusing on "circularity" and reducing "sustainability pressures" positively affects the creation of CBMs (e.g., Bocken et al., 2016; Tukker, 2015). Besides, the commitment of supervisors to sustainability matters (Muller & Kolk, 2010), a mentorship culture encouraging sustainable entrepreneurship (Tukker, 2015), and the alignment of sustainability initiatives with the firm mission by top management (Bansal, 2003; Marcus & Anderson, 2006) is crucial for a positive effect on CBMs.

Values. Contributing to CE as a shared responsibility feeling among employees is a key motivator and hence antecedent for CBM (Geissdoerfer et al., 2017). Normative values such as a sense of responsibility and duty (Bansal & Roth, 2000; Sharma, 2000) and a sense of stewardship (Marquis, Glynn, & Davis, 2007) drive sustainability from within the organization. This could, for example, be achieved by explicitly setting CSR or CE orientation as a social norm from a human resource management perspective (Shen & Benson, 2016).

10.5465/AMBPP.2021.225

Research on outcomes

We differentiate between organizational and environmental performance outcomes.

Firstly, as an organizational and financial outcome, scholars expect a positive business case for corporations (e.g., Peloza, 2009; Vishwanathan, van Oosterhout, Heugens, Duran, & Essen, 2020). On the revenue side, value is created from "waste" itself (Bocken et al., 2016a), through classical BMI and differentiation opportunities (Lahti, Wincent, & Parida, 2018; Tukker, 2015) that allow higher margins (e.g., Schäufele & Hamm, 2017), or for example through entering "new repair and service markets" (Bocken et al., 2016a). On the cost side, efficiencies through less material usage or shared communal services in new collaborative CBM networks decrease cost (Bocken et al., 2016a). However, most likely, setting up a new CBM occurs investment cost in the short term (Kirchherr et al., 2018; Masi, Kumar, Garza-Reyes, & Godsell, 2018).

Secondly, regarding organizational innovation outcomes, Tukker (2015: 85) summarizes that Product-Service-Systems, (similar to CBMs) typically lead to higher client loyalty, increased reputation of both the offering (Orlitzky, Schmidt, & Rynes, 2003; Vishwanathan et al., 2020) and the firm (Aguinis & Glavas, 2012; Brammer & Millington, 2008), and an improved customer relationship (Sousa-Zomer, Magalhães, Zancul, Campos, & Cauchick-Miguel, 2018), which in return allows increasing customer-centric innovation (Zott & Amit, 2007), and innovation capacity for future growth (Vishwanathan et al., 2020).

Thirdly, similar to CSR, CBMs may positively affect other organizational outcomes, such as employee-related factors (e.g., organizational identification (Carmeli, Gilat, & Waldman, 2007; Jones, 2010), and future employee attractiveness (e.g., Klimkiewicz & Oltra, 2017) (for more see Aguinis & Glavas, 2012)). CBMs may also allow access to funds as investors increasingly tie their investments to sustainability requirements (Bugg-Levine & Emerson, 2011). Besides, circularity can decrease dependence on suppliers and input materials and, thus, decrease risk deriving from complicated supply chains and scarce resources (De Angelis, Howard, & Miemczyk, 2018). Overall, this leads to increased firm competitiveness (Alix & Vallespir, 2010).

For environmental performance outcomes, we refer to economic, environmental, and consumer effects. Economic prosperity affects not only the CBM-firm itself but also the partnering firms of the circular loop (Veleva & Bodkin, 2018) and the macro-economic system (Spiess-Knafl, Mast, & Jansen, 2015), e.g., by increasing employment (e.g., Cooper & Hammond, 2018). Besides, improved environmental quality (e.g., Moraga et al., 2019), less resource depletion, and reduced toxicity/pollution (e.g., Saidani, Kim, Cluzel, Leroy, & Yannou, 2020) are the effects of CBMs. A potential adverse effect derives from consumers' rebound effects (e.g., Zink & Geyer, 2017) as they might "spend their cost savings on other “polluting activities” (Bocken et al., 2016a: 315). Lastly, consumer benefits from CBMs: e.g., through lower prices of service-driven offerings (Camacho-Otero, Boks, & Pettersen, 2018), or the positive feeling that derives from participating in "creating environmental quality" (Kirchherr et al., 2017: 225).

Research on environmental factors

Environmental factors are widely considered vital influencing variables in organizational theory (e.g., Ranta, Aarikka-Stenroos, Ritala, & Mäkinen, 2018). We differentiate direct effects on CBMs, moderating or mediating effects on the relationship between CBM and performance, or between antecedents and CBM relationship.

Direct effects of environmental factors on CBM. Especially the institutional theory lens allows us to identify direct effects on CBM stemming from environmental dynamism and

10.5465/AMBPP.2021.225

uncertainty (Zhang et al., 2020) and relate to stakeholders (e.g., shareholders (David, Bloom, & Hillman, 2007; Rehbein, Waddock, & Graves, 2004), consumers (Cohen & Muñoz, 2017; Gazzola, Pavione, Pezzetti, & Grechi, 2020), or external activist groups (Den Hond & De Bakker, 2007)), regulation (e.g., Kirchherr et al., 2018; McDowall et al., 2017) and the broader firm context (e.g., Jakhar, Mangla, Luthra, & Kusi-Sarpong, 2019). According to this view, CBM innovation might occur as a response to, for example, competitive pressure (e.g., Doz & Kosonen, 2010).

Moderation and mediation of the CBM-performance relationship. Environmental dynamism, defined as the degree of instability (Eroglu & Hofer, 2014) "in technologies, variations in customer preferences, and fluctuations in product demand or supply of materials" in the external firm environment (Jansen, Van Den Bosch, & Volberda, 2006: 1664), has a positive moderating effect on the relationship between green product innovation and firm performance, both in terms of profitability and cost efficiency (Chan, Yee, Dai, & Lim, 2016). Besides the driving force of the customer, third-party praise for sustainability (Klassen & McLaughlin, 1996) or subsidies (Chen, Dimitrov, & Pun, 2019) can enhance organizational performance outcomes.

Moderation through environmental factors of the antecedent-CBM relationship. While various CBM studies mention the importance of boundary conditions, referring to the importance of ESs collaboration (Geissdoerfer et al., 2020) or the influence of legislative measures (Donner, Verniquet, Broeze, Kayser, & De Vries, 2021), we have not identified studies that meaningfully investigated external factors' effect on the antecedent-CBM relationship.

Research on other moderating factors

Organizational barriers to the CE and potential organizational catalysts have partly been identified conceptually and through literature reviews (Sarja, Onkila, & Mäkelä, 2021). However, the literature on organizational moderators is still scarce – especially in its empirical evidence. In the following, we briefly summarize the most relevant relationships derived from existing research streams, namely strategic fit, resources, innovative capacity, culture, and capabilities and experiences. Due to space constraints, we focus on the first two.

Strategic fit. The strategic fit to the overall firm strategy (Foss & Saebi, 2016) of a CBM will positively moderate the CBM-performance linkage. For example, a novel CBM will be more successful if the new product portfolio constellation avoids internal cannibalization (Tukker, 2015). The available capabilities to create the fitting BM design hence enhances the firm performance of the CBM (Zott & Amit, 2008).

Resources. The availability of organizational slack resources (Bansal, 2003) positively moderates the antecedent-CBM linkage and the CBM-performance linkage: Antecedents like top management attention can more likely lead to the development of CBMs when initial investment cost, as well as ad-hoc financial support for iterations, can be covered.

SYNTHESIS OF CIRCULAR BUSINESS MODEL RESEARCH

The CBM concept needs to develop further to reach paradigmatic status, i.e., it should produce generalizable insights, theories, and methods to test these (as per the definition of Kuhn (2012)). By using the four conditions defined by Fry and Smith (1987), we show how the CBM is currently on a good path but still at the conceptual (pre-paradigmatic) level of development (see also Dubin, 1978). We also suggest avenues for future research by listing the main insights deriving from the four conditions on firstly, variables of interest, secondly, congruence, thirdly, boundaries, and fourthly, contingency effects.

10.5465/AMBPP.2021.225

Firstly, concerning variables of interest, multi-level analysis and micro-foundations are the most prominent gaps: Most CBM studies take an organizational business case perspective (Diaz Lopez et al., 2019; Weissbrod & Bocken, 2017), while CE studies take a macro/institutional lens (Govindan & Hasanagic, 2018), and ES literature offers meso-level implications (Jacobides et al., 2018). CBM research would benefit from examining these levels' interrelations as challenges on one level might be solved on another. We see a significant research gap for individual or team-level CBM studies concerning micro-foundations. Neither topics such as CBM specific leadership nor employee attitude, nor team dynamics have been examined yet. While it is typical for a research field to start from an institutional perspective (e.g., see the development of CSR research outlined by Aguinis & Glavas (2012)), we expect a great benefit from investigating individual-and team level evidence from various stakeholders, such as consumers, managers, or policy-makers.

Secondly, concerning congruence, cumulative theorizing should be proved empirically by identifying causal relationships – at least by formulating cause-effect relationships regarding antecedents and consequences of the phenomenon (Fry & Smith, 1987). The CBM literature has started to suggest relationships (e.g., Tura *et al.*, 2019; Vermunt *et al.*, 2019; Guldmann and Huulgaard, 2020), however, with limited empirical evidence. While this paper proposes relationships between antecedents, moderators, and outcomes of CBMs a research gap persists regarding the interrelation of antecedents and the effects on performance outcomes (and its empirical evidence). Closing this gap will move the concept closer to a paradigmatic status (Fry & Smith, 1987) and motivate adoption in practice.

Thirdly, concerning boundaries, we observe a strong focus on the company boundaries in current CBM research (Geissdoerfer et al., 2020), and therefore call for a more dynamic investigation of CBMs and for a more granular and differentiated view on boundary conditions: Variables may occur in different functions and vary over time. For example, regulation can be an antecedent if a new directive prescribes recycling standards and positively moderate the CBM-outcome linkage if the regulation comes in the form of a subsidy. Hence, scholars should also differentiate between direct, moderating, or mediating effects (Baron & Kenny, 1986), given that the available literature on this aspect is still thin in CBM research.

Fourthly, to reach paradigmatic status, scholars must formulate contingency hypotheses that allow the generalizability of relationships in a pre-defined model (Donaldson, 2001). Thus, exciting avenues for future research are to validate the current propositions related to CBM by testing those in various configurations of organizations and with different CBM types. We suggest doing so both through empirical qualitative and quantitative studies. With the integrated research framework of this article, CBM scholars hopefully find a) an insightful starting point to guide their efforts of testing proposed relationships; or b) further inspiration to propose new hypotheses.

CONCLUSION

Despite the general trend to conduct relatively narrow and specialized studies in management research, this review provides a bigger picture of the CBM concept. It links relevant, but thus far, not related research streams of CE, CSR, BMI, and ESs to the CBM research field. Like this, we hope to spark more extensive discussions and inspire future research on the CBM concept without the need to reinvent the wheel: We hope that this can move the emergent concept of CBM to a paradigmatic level faster and enhance a more systematic knowledge accumulation.

REFERENCES AVAILABLE FROM THE AUTHOR