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Fifteen Years of Research on Business Model Innovation: How Far Have We Come, and Where Should We Go?

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Over the last 15 years, business model innovation (BMI) has gained an increasing amount of attention in management research and among practitioners. The emerging BMI literature addresses an important phenomenon but lacks theoretical underpinning, and empirical inquiry is not cumulative. Thus, a concerted research effort seems warranted. Accordingly, we take stock of the extant literature on BMI. We identify and analyze 150 peer-reviewed scholarly articles on BMI published between 2000 and 2015. We provide the first comprehensive systematic review of the BMI literature, include a critical assessment of these research efforts, and offer suggestions for future research. We argue that the literature faces problems with respect to construct clarity and has gaps with respect to the identification of antecedent conditions, contingencies, and outcomes. We identify important avenues for future research and show how the complexity theory, innovation, and other streams of literature can help overcome many of the gaps in the BMI literature.

Keywords: *business model; business model innovation; literature review; design and boundaries*

The concepts of business models (BMs) and, more recently, BM innovation (BMI) have become influential in macromanagement research in recent years (Spieth, Schneckenberg, &

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Ricart, 2014; Zott, Amit, & Massa, 2011). Recent reviews of the BM literature have highlighted the usefulness of the BM construct in research on e-commerce, strategy, and technology management (cf. Zott et al., 2011); its use in different theories (cf. George & Bock, 2011); and the evolution of the BM term itself (cf. Wirtz, Pistoia, Ullrich, & Gottel, 2016). Such reviews also point to definitional convergence so that many contributions to the literature now proffer a notion of BM as the "design or architecture of the value creation, delivery, and capture mechanisms" of a firm (Teece, 2010: 172).

In contrast, the innovation of BMs—ostensibly, a new source of innovation that "complements the traditional subjects of process, product, and organizational innovation" (Zott et al., 2011: 1032)—is less well understood, perhaps reflecting that the BMI literature is more recent than the BM literature. However, it is also rapidly growing, suggesting that BMI is an important phenomenon that needs to be conceptualized and theorized on its own. Thus, while BM and BMI are no doubt related, research on BMI introduces the additional dimension of innovation and hereby raises a number of crucial theoretical and empirical questions: What are the drivers, facilitators, and hindrances of the innovation of a BM? Under which circumstances can BMI give rise to sustained competitive advantage? Does BMI exclusively originate in the upper echelons, or may it also originate in lower levels of the organization? However, such fundamental questions are not currently being systematically posed, addressed, and answered, reflecting the emergent nature of BMI research. Furthermore, reviews on BMI are limited (e.g., Schneider & Spieth, 2013; Spieth et al., 2014) and do not provide systematic discussions of the phenomenon or the challenges that it represents for research. Therefore, a more comprehensive review and assessment of the BMI literature are warranted.

Accordingly, the purpose of this article is to take stock of the literature on BMI, evaluate it, and outline avenues for future research. We first conduct a comprehensive literature review of 150 scholarly publications on BMI, finding that the BMI literature is mainly focused on either examining the facilitators of BMI as an organizational process or identifying new and "innovative" types of ventures. Thus, the BMI construct is to a large extent used as mainly a classificatory device, and a part of the literature does not seem to have aspirations of developing a distinct theory of BMI.[1] In contrast, systematic research on the antecedents, moderators, and implications of BMI remains limited, leading us to question whether a true theory of BMI exists. To address this question, we assess the extent to which the BMI field is characterized by, for example, clear-constructed, well-delineated boundary conditions, identification of explanatory mechanisms, and other traditional hallmarks of good theory. We find that the literature is lacking (to varying degrees) in all dimensions. We provide a simple organizing framework that outlines the causal web of potential antecedent, moderating, and mediating influences on BMI, as well as the consequences of such innovation. As part of the framework, we define BMI as "designed, novel, nontrivial changes to the key elements of a firm's business model and/or the architecture linking these elements." Finally, we argue that BMI research may be advanced by drawing on theorizing in the innovation, entrepreneurship, complexity, and other streams of literature, all of which can help meet the gaps in the BMI literature.

BMI represents a novel and more holistic form of organizational innovation that warrants theory building, operationalization, and testing. Early CEO-level surveys indicated that BMI is a key source of sustained value creation (IBM Global Business Services, 2006), even trumping new products and services as a source of future competitive advantage (Economist

Intelligence Unit, 2005). In fact, innovative BMs are found to positively influence the performance of entrepreneurial firms, "even under varying environmental regimes" (Zott & Amit, 2007: 181). Similarly, established firms that innovate their BMs experience positive performance effects (Cucculelli & Bettinelli, 2015). While this adds legitimacy to the fast-growing academic and corporate interest in the field, it highlights the need for additional conceptual and empirical research on BMI aimed at deriving a better understanding of the phenomenon. Consequently, undertaking some ground clearing in this emerging field is vital to its development, and such ground clearing is what we seek to offer in this article.

Research on BMI: Emergence of the Field and Prior Reviews

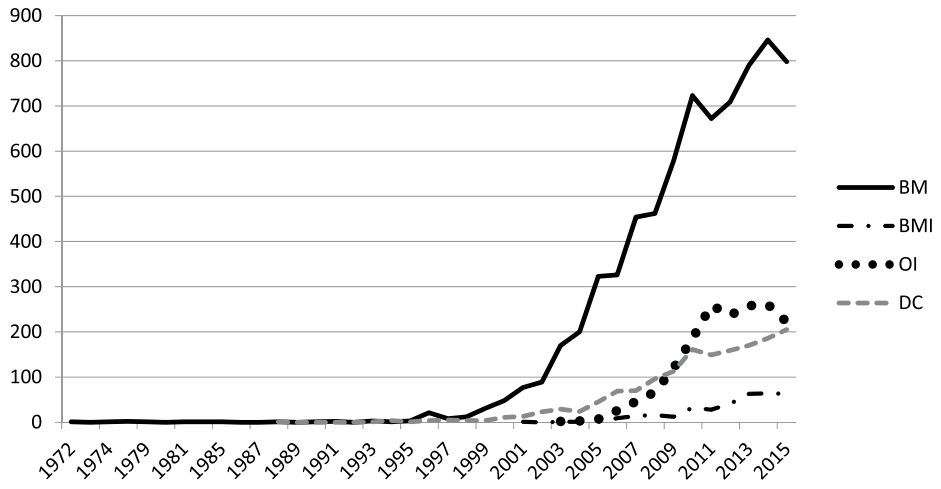
From BMs to BMI

The notion of BMs is several decades old (e.g., Bellman, Clark, Malcolm, Craft, & Ricciardi, 1957). The original definitions associated it with an operative activity for system modeling in the context of information technology (Wirtz et al., 2016). It was only in the mid-1990s that entrepreneurship and strategy scholars applied the construct as a holistic description of a firm's key business processes and how they are linked (Zott et al., 2011). Although definitions differ across studies (see Table 1 in the online supplemental material), most current definitions are close to or consistent with Teece's (2010: 172) definition of a BM as the "design or architecture of the value creation, delivery, and capture mechanisms" of a firm. Furthermore, as Saebi, Lien, and Foss (2016) show, despite using different terminology, the literature converges on the components that constitute a BM—namely, "the firm's value proposition and market segments, the structure of the value chain required for realizing the value proposition, the mechanisms of value capture that the firm deploys, and how these elements are linked together in an architecture."

The evolution of the BM literature has been broadly categorized into three streams of research (cf. Lambert & Davidson, 2013; Zott et al., 2011). First, the BM is used as a basis for enterprise classification: By the early 21st century, as new e-business ventures emerged, the BM construct was increasingly employed to understand and classify value drivers of (e-commerce) BMs (see Amit & Zott, 2001; Magretta, 2002). Second, the BM is seen as an antecedent of heterogeneity in firm performance; specifically, BMs are argued to be an important factor contributing to firm performance. As some types of BMs are found to outperform others (cf. Weill, Malone, D'Urso, Herman, & Woerner, 2005; Zott & Amit, 2007, 2010), successful BMs are seen as examples to be imitated (cf. Chesbrough, 2010; Teece, 2010) or replicated (Doz & Kosonen, 2010; Winter & Szulanski, 2001). Third, the BM is seen as a potential unit of innovation (Zott et al., 2011). The idea that managers can purposefully innovate their BM was first explicitly discussed in 2003 by Mitchell and Coles. Since then, an increasing number of studies have focused on the innovation dimension of the BM and examine BMI from a variety of angles (which we discuss here). Thus, while BMI is an extension of BM, it incorporates a number of important research questions that reach beyond the boundaries of traditional BM literature.

Notably, in comparison with the huge volume of research on BMs, the number of published papers that address BMI per se is still comparatively low at 349 (peer reviewed and otherwise; see Figure 1).

Figure 1
Use in the Scholarly Literature of Some Key, Related Macroconstructs



Source: Scopus, 1972–2015. "Business model" (BM), 7,391 hits; "business model innovation" (BMI), 349 hits; "open innovation" (OI), 1,700 hits; "dynamic capability" (DC), 1,562 hits (peer reviewed and otherwise). Scopus searched for the terms "business model," "business model innovation," "open innovation," and "dynamic capability" in the search field "abstract, title, keyword" within the field of "social sciences and humanities," thereby excluding physical, health, and life sciences (January 2016).

Figure 1 shows that over the last two decades, the BM literature has expanded massively—even faster than the related dynamic capabilities literature, which emerged at about the same time. The Scopus database lists 7,391 publications on the topic of "business model" for the period 1980–2015 (see Figure 1),[2] with the number of special issues and edited volumes dedicated to exploring aspects of BMs increasing over time.[3] While the BMI literature has expanded, it is a much smaller literature, considerably smaller than the somewhat-related literature on open innovation. Two closely related factors may account for the relatively low number of publications on BMI—namely, that BMI research is relatively recent and noncumulative. The BMI literature is a recent outgrowth of the BM literature. Although the notion that BMs can be innovated dates back to at least Mitchell and Coles (2003), it is only relatively recently that this insight has become more than an afterthought (Zott et al., 2011). Second, despite much practitioner and scholarly interest in BMI, the literature exhibits many of the characteristics of an emerging research stream—notably, a lack of construct clarity (Suddaby, 2010). As Casadesus-Masanell and Zhu (2013: 480) observe, BMI is "a slippery construct to study." In turn, a lack of construct clarity makes operationalization and measurement difficult. Additionally, the BMI literature does not possess clearly articulated research models that lay out the basic causal web-connecting antecedent, moderating, and mediating variables with the key construct and consequences. All these characteristics hinder cumulativeness of research efforts. In fact, similar observations have been made concerning the BM literature (Foss & Saebi, 2015; Zott et al., 2011), so it is perhaps not surprising that characteristics of BM research carries over to BMI research. However, cumulativeness in science is usually taken to be dependent on constructs, models, and heuristics being clear and agreed on (Singer, 1975).

Table 1
Articles Reviewing Business Models and Business Model Innovation

Focus: Authors	Findings	Data source and sample
Business models (BMs)		
George and Bock (2011)	Use of business models • Organizational design • Resource-based view • Narrative and sense making • Nature of innovation • Transactive structure • Opportunity facilitator	EBSCO Business Source Premier and ISI Web of Science, *n* = 108 articles
Zott et al. (2011)	Three themes of BM literature • E-business • Business models and strategy • Innovation and technology management	EBSCO Business Source Premier, *n* = 103 articles
Lambert and Davidson (2013)	Three themes of BM literature • Business model as basis for enterprise classification • Business models and enterprise performance • Business model innovation	ProQuest database, *n* = 69 articles
Wirtz et al. (2016)	Four research foci • Innovation • Change and evolution • Performance and controlling • Design	EBSCO Business Source Complete, *n* = 681 articles
Business model innovation (BMI)		
Schneider and Spieth (2013)	Three streams of BMI research: • Prerequisites of conducting BMI • Process and elements of BMI • Effects achieved through BMI	ISI Web of Knowledge and SSRN, *n* = 35 articles
Spieth et al. (2014)	Three motivations for engaging in BMI research: • Explaining the business • Running the business • Developing the business	Not provided
Current study	Theory assessment and research agenda: • Construct clarity • Congruence • Contingency hypotheses • Boundary conditions	EBSCO Business Source Complete and Science Direct, *n* = 150 articles

Prior Reviews of BMI Research

There are now a number of systematic literature reviews of the BM literature (e.g., George & Bock, 2011; Lambert & Davidson, 2013; Wirtz et al., 2016; Zott et al., 2011; see Table 1).

However, only one article specifically reviews the BMI literature—namely, that by Schneider and Spieth (2013: 134), which reviews 35 papers on BMI. The authors identify the "prerequisites," "process," and "effects" of BMI as the three leading themes in the BMI literature, and they call for further research on "the process and elements of business model innovation as well as its enablers and effects in anticipation and response to increasing environmental volatility." A few other papers are (at best) borderline review papers. For example, Spieth et al. (2014) do not undertake a literature survey but discuss three ways in which the BMI construct may be relevant for academics and practitioners. Zott and colleagues' (2011) review of the BM literature analyzes 103 articles and identifies three streams of BM research, one of which focuses on BMs as a source of innovation or an instance of organizational innovation. However, although Zott et al. highlight the BM as a new subject in relation to innovation, they do not review the BMI literature per se. Similarly, Lambert and Davidson (2013) discuss a sample of 69 articles on BMs and identify a number of research streams, one of which addresses BMI. In sum, while the emerging BMI field is expanding quickly, scholars in it do not yet have access to a review that is comprehensive, analytical, and forward looking.

Method

We searched the EBSCO Business Source Premier database for academic articles containing the term "business model innovation" in the title, abstract, or keywords (Boolean phrase, English, limited to peer-reviewed work in academic journals). We used quotation marks to exclude irrelevant mentions based on grammatical coincidence. Furthermore, it became clear that other concepts are often used to describe what is effectively BMI, such as BM "reinvention" (Voelpel, Leibold, & Tekie, 2004), "renewal" (Doz & Kosonen, 2010), "dynamics" (e.g., Achtenhagen, Melin, & Naldi, 2013; Cavalcante, Kesting, & Ulhøi, 2011), "transformation" (e.g., Aspara, Lamberg, Laukia, & Tikkanen, 2013), and "evolution" (e.g., Bohnsack, Pinkse, & Kolk, 2014; Demil & Lecocq, 2010). Additionally, terms such as BM "innovation" or "dynamics" are often used interchangeably to refer to a similar phenomenon. Therefore, we searched the EBSCO database for additional articles including these search terms or a combination thereof (in titles, abstracts, or keywords). This led to the following breakdown: "business model innovation" (234 hits), "innov* business model" (36 hits), "business model transformation" (10 hits), "business model renewal" (3 hits), "business model reinvention" (4 hits), "business model evolution" (12 hits), and "business model dynamics" (5 hits). Omitting repetitions, these search criteria yielded 276 unique citations.[4] The first publication dated from the year 2000 (i.e., Malhotra, 2000). A second search for "business model innovation" (and related terms) was conducted via the Science Direct search engine through the "title, abstract, keywords" feature. This second search generated 61 citations. The combination of the search results yielded a total of 313 unique citations in the review set (24 citations occurred in both search outputs).

To identify relevant articles, we required that the topic of BMI be dealt with in an essential way (see George & Bock, 2011; Lambert & Davidson, 2013; Zott et al., 2011). Specifically, we eliminated articles that mentioned the term "business model innovation" (often in the abstract or keywords) but failed to explain or use the concept ($n = 135$). We also excluded book reviews, interviews, case studies, and summaries of articles published elsewhere ($n = 46$). This left us with 132 relevant articles. In addition, we included work found in leading practitioner-oriented

Table 2
Streams of Business Model Innovation Research

Research Focus	Method	Examples
1. Conceptualization and classification of BMI	Conceptual, case examples	Amit and Zott (2012), Johnson et al. (2008), Koen et al. (2011), Markides (2006), Santos et al. (2009), Sorescu et al. (2011)
	Survey data	Giesen et al. (2007)
2. BMI as a process (e.g., importance of capabilities, leadership, learning mechanisms)	Conceptual, case examples	Berglund and Sandström (2013), Cavalcante (2014), de Reuver et al. (2009), Deshler and Smith (2011), Evans and Johnson (2013), Girotra and Netessine (2013, 2014)
	Single/multiple case studies	Achtenhagen et al. (2013), Aspara et al. (2013), Demil and Lecocq (2010), Deshler and Smith (2011), Dmitriev et al. (2014), Doz and Kosonen (2010), Dunford et al. (2010), Enkel and Mezger (2013), Frankenberger et al. (2013), Günzel and Holm (2013), Khanaga et al. (2014), Moingeon and Lehmann-Ortega (2010), Mezger (2014), Pynnonen et al. (2012), Sosna et al. (2010)
	Content analysis	Bohnsack et al. (2014)
	Experimental	Eppler and Hoffmann (2012), Eppler et al. (2011)
3. BMI as an outcome (e.g., identifying/ describing innovative business models)	Single/multiple case studies	Abdelkafi et al. (2013), Anderson and Kupp (2008), Gambardella and McGahan (2010), Sánchez and Ricart (2010), Yunus et al. (2010), Wirtz et al. (2010), Berman (2012), Holm et al. (2013), Richter (2013), Visnjic Kastalli and Van Looy (2013)
4. BMI and organizational implications/ performance	Survey data	Zott and Amit (2007), Giesen et al. (2007), Aspara et al. (2010), Bock et al. (2012), Denicolai et al. (2014), Huang et al. (2012, 2013), Pohle and Chapman (2006), Cucculelli and Bettinelli (2015), Wei et al. (2014), Velu and Jacob (2014), Kim and Min (2015)

journals, such as *MIT Sloan Management Review*, *California Management Review*, and *Harvard Business Review*. Articles in these and other publications that we deemed relevant (based on the above criteria) were included in our review.[5,6]

The final 150 publications were reviewed in terms of their conceptual, theoretical, and empirical development and contributions. Furthermore, to identify the main streams of research within the BMI literature, all papers in our sample were coded according to the main research focus (e.g., BMI as a process, BMI as an outcome) and research method (qualitative, quantitative). We ensured the integrity of coding by having the authors assess each paper individually before comparing results and reaching a consensus. Overall, we were able to distinguish four streams of research.

BMI Field: Four Streams of Research

On the basis of our literature review and coding procedure, we distinguish four partly overlapping streams of BMI research (see Table 2). These four streams represent important strides forward; however, they also have limitations that are scrutinized as follows.

Research Stream 1: Conceptualizing BMI

The first stream highlights the phenomenon itself, offering definitions and conceptualizations of BMI (e.g., Amit & Zott, 2012; Santos, Spector, & Van der Heyden, 2009; Teece, 2010). Thus, it focuses on such issues as the minimum meaningful definition of "business model innovation" and the dimensions along which companies can innovate the BM (e.g., Amit & Zott, 2012; Santos et al., 2009; Sorescua, Frambach, Singh, Rangaswamy, & Bridges, 2011). The aim seems to be the development of classificatory schemes. However, as we show, definitions abound, differ markedly, and are often ambiguous.

Research Stream 2: BMI as an Organizational Change Process

Innovation is known to often strongly challenge organizational processes (e.g., Damanpour, 1996). It is not surprising, therefore, that a stream of research relates BMI to organizational change processes. This stream emphasizes the capabilities, leadership, and learning mechanisms that are needed for successful BMI. Studies within this stream describe BMI as a dynamic process by

- highlighting the different stages of the BMI process (e.g., de Reuver, Bouwman, & Haaker, 2013; Frankenberger, Weiblen, Csik, & Gassmann, 2013; Girotra & Netessine, 2013, 2014; Pynnonen, Hallikas, & Ritala, 2012),
- identifying the different organizational capabilities and processes required to support this change process (e.g., Achtenhagen et al., 2013; Demil & Lecocq, 2010; Doz & Kosonen, 2010; Dunford, Palmer, & Benviste, 2010),
- citing the importance of experimentation and learning (e.g., Andries & Debackere, 2013; Cavalcante, 2014; Eppler, Hoffmann, & Bresciani, 2011; Günzel & Holm, 2013; Moingeon & Lehmann-Ortega, 2010; Sosna, Trevinyo-Rodriguez & Velamuri, 2010), and
- proposing practitioner-oriented tools for managing the process (e.g., Deshler & Smith, 2011; Evans & Johnson, 2013).

Research Stream 3: BMI as an Outcome

A third stream of BMI literature focuses on the outcome of the organizational change process—new and innovative BMs, which are typically contextualized in some way. This stream often addresses the emergence of new BMs in a particular industry, such as electric mobility (Abdelkafi, Makhotin, & Posselt, 2013), newspapers (Holm, Günzel, & Ulhøi, 2013; Karimi & Zhiping, 2016), tourism (Souto, 2015), and aviation (Schneider & Spieth, 2013). Other research in this stream examines one particular type of new BM, such as that for low-income markets (Anderson & Kupp, 2008; Sánchez & Ricart; 2010; Yunus, Moingeon, & Lehmann-Ortega, 2010), sustainable energy (Richter, 2013), manufacturing firms (Witell & Löfgren, 2013), or service (Visnjic Kastalli & Van Looy, 2013). Other articles describe a particular company's "innovative" BM, such as Nestlé's Nespresso (Matzler, Bailom, den Eichen, & Kohler, 2013). Perhaps surprising, contributions to this research stream do not usually build on the first research stream. Instead, the focus is on describing one particular type of change of BM, often claimed to be a new kind. However, this descriptive stream does not offer a discussion of the criteria under which the relevant BM change can be regarded as being novel.

Research Stream 4: Consequences of BMI

The fourth stream addresses the organizational performance implications of BMI. In this stream, we can differentiate between studies that link the "act," or process, of BMI to outcome implications (e.g., Aspara, Hietanen, & Tikkanen, 2010; Bock et al., 2012; Cucculelli & Bettinelli, 2015; Giesen, Berman, Bell, & Blitz, 2007) and those that examine the effects of different types of BMs on firm performance (e.g., Huang, Lai, Lin, & Chen, 2013; Wei, Yang, Sun, & Gu, 2014; Zott & Amit, 2007, 2008). In the first case, studies assume a process view and investigate whether an innovative change in the existing BM leads to superior performance outcomes. For example, Aspara et al. (2010) compare the financial performance implications of BMI to those of replication, while Giesen et al. (2007) find that BMI targeted at disrupting the industry chain, revenue model, or organizational boundaries yields no significant variation in financial performance across the different types of BMI. In the context of entrepreneurial firms, Cucculelli and Bettinelli (2015) find that firms who modified their BMs over time and, in an innovative way, experienced a positive effect on venture performance.

In the second case, studies do not directly link BMI to performance outcomes. Instead, they empirically test the effects of different BM designs on innovation performance. For example, after differentiating between novelty- and efficiency-centered BM designs, Zott and Amit (2007) found a positive relation between novelty-centered BMs and firm performance in entrepreneurial firms. In a later study (2008), these same authors show the importance of fit between product market strategy and BM design for enhancing firm performance. After adopting the same differentiation of novelty- and efficiency-centered BM designs, Wei et al. (2014) examined how exploitative and exploratory innovation fit with different BM designs to promote growth in Chinese firms.

Strengths and Weaknesses of the Four Streams

The BMI literature has yielded several key insights. A fundamental contribution to macromanagement research in its own right is that firms can introduce changes into the design and architecture of their BMs that are novel to a context and potentially the basis of substantial appropriable value creation and competitive advantages. Several advances have been made in our understanding of the nature of such innovation, its process dimension, and its consequences. In particular, two main lines of argumentation are apparent. Studies either adopt a dynamic view of BMI and conceptualize it as an organizational change process requiring appropriate capabilities, leadership, and learning mechanisms (Research Stream 2) or view BMI statically as new types of innovative ventures (Research Stream 3) that may affect firm performance (Research Stream 4).

Nevertheless, as the above brief characterization of the literature suggests, BMI research does not exhibit the characteristics of a well-defined cumulative research stream. Many contributions are conceptual rather than theoretical or are fundamentally descriptive rather than explanatory. For example, our review did not result in the identification of articles that clearly deal with the antecedents of BMI. Furthermore, the four research streams have largely evolved in relatively isolated silos (as indicated by little cross-citation among the streams) and do not seem to build off one another.

Gaps and Challenges in BMI Research

In management research, theory is conventionally understood as requiring the specification of (a) the constructs or variables of interest; (b) congruence, which is the set of laws of relationship or mechanisms among constructs or variables; (c) the boundaries or scope within which the laws or mechanisms are expected to operate; and (d) the contingency or moderation hypotheses within which the integrity of the system is maintained but in a markedly different condition (Dubin, 1978). More compactly, theory is an account of constitutive, causal relationships between two or more concepts within a set of boundary conditions. In the following, we engage in a gap-finding mission in the BMI literature, based on the above understanding of theory in management research. We argue that filling the gaps that we identify will advance the BMI literature.

Gap 1: Construct Definition and Dimensionalization

Defining the unit of analysis. Scholars often insist on the importance of concept/construct clarity (e.g., Suddaby, 2010) and clearly accounting for the causal relations and mechanisms that link different constructs (Fry & Smith, 1987). Clear definitions and demarcations of concepts often ease the understanding of the causal relations that may link them, and they keep the number of moving parts manageable. Additionally, construct clarity means that it is easier for scholars to coordinate their research efforts, furthering cumulativeness in science. Finally, construct clarity eases operationalization and measurement, thereby making theory easier to test. While construct clarity is desirable in general, it is arguable that it is particularly important for the construct that is intended to capture the focal object or unit of analysis—here, BMI.

Our review above revealed a first deep ambiguity with respect to what a BMI is. As we explained above, one research stream views BMI as a process (e.g., search, experimentation, transformation), while another one views it as an outcome (i.e., the innovative BM). Such differences have important implications for subsequent research. Studies that perceive BMI as a process often take a dynamic approach and look into the organizational characteristics that facilitate or hinder the process of BMI (e.g., Demil & Lecocq, 2010; Doz & Kosonen, 2010). Studies that focus on the outcome (i.e., the new and "innovative" BM) tend to be more descriptive and identify the content of the BMI ex post (e.g., Bucherer, Eisert, & Gassmann, 2012; Günzel & Holm, 2013; Johnson, 2010; Mitchell & Coles, 2004a, 2004b). Both types of studies have their merits, but they deal with different phenomena and may require different empirical approaches (i.e., the process approach to BMI may inherently require more of a qualitative approach than the content approach). If we inspect actual definitions of BMI, the diversity becomes even more pronounced (see Table 3).

Table 3 points to lack of clarity in the literature about the nature of a BMI. Definitions abound, and many of those definitions lack specificity. Thus, some scholars take a partial view in which changes in a single component of a BM can constitute BMI. Giesen et al. (2007) conceptualize BMI as innovations in the "industry value chain" (entering new industries), the "revenue model" (offering novel offering or pricing models), and/or the "enterprise model" (redefining organizational boundaries). Others define BMI as innovation in technologies, value networks, and financial hurdle rates (Koen, Bertels, & Elsum, 2011). Such definitions place the emphasis on the components of a BM.

Table 3
Selected Definitions of Business Model Innovation (Ordered Chronologically)

Authors	Definitions
Mitchell and Coles (2004a: 17)	"By business model innovation, we mean business model replacements that provide product or service offerings to customers and end users that were not previously available. We also refer to the process of developing these novel replacements as business model innovation."
Markides (2006: 20)	"Business model innovation is the discovery of a fundamentally different business model in an existing business."
Santos et al. (2009: 14)	"Business model innovation is a reconfiguration of activities in the existing business model of a firm that is new to the product service market in which the firm competes."
Aspara et al. (2010: 47)	"Initiatives to create novel value by challenging existing industry-specific business models, roles and relations in certain geographical market areas."
Gambardella and McGahan (2010: 263)	"Business-model innovation occurs when a firm adopts a novel approach to commercializing its underlying assets."
Yunus et al. (2010: 312)	"Business model innovation is about generating new sources of profit by finding novel value proposition/value constellation combinations."
Sorescu et al. (2011: S7)	"As a change beyond current practice in one or more elements of a retailing business model (i.e., retailing format, activities, and governance) and their interdependencies, thereby modifying the retailer's organizing logic for value creation and appropriation."
Amit and Zott (2012)	Innovate business model by redefining (a) content (adding new activities), (b) structure (linking activities differently), and (c) governance (changing parties that do the activities).
Bucherer et al. (2012: 184)	"We define business model innovation as a process that deliberately changes the core elements of a firm and its business logic."
Abdelkafi et al. (2013: 13)	"A business model innovation happens when the company modifies or improves at least one of the value dimensions."
Aspara et al. (2013: 460)	*Corporate business model transformation* is defined as "a change in the perceived logic of how value is created by the corporation, when it comes to the value-creating links among the corporation's portfolio of businesses, from one point of time to another."
Berglund and Sandström (2013: 276)	"A BMI can thus be thought of as the introduction of a new business model aimed to create commercial value."
Casadesus-Masanell and Zhu (2013: 464)	"At root, business model innovation refers to the search for new logics of the firm and new ways to create and capture value for its stakeholders; it focuses primarily on finding new ways to generate revenues and define value propositions for customers, suppliers, and partners."
Khanagha et al. (2014: 324)	"Business model innovation activities can range from incremental changes in individual components of business models, extension of the existing business model, introduction of parallel business models, right through to disruption of the business model, which may potentially entail replacing the existing model with a fundamentally different one."

Another group of scholars stresses that what is being innovated is the architecture of a BM rather than its individual components (e.g., the value proposition, the segments addressed, the value chain). Thus, the emphasis is on the links among the activities underlying the components of a BM. For example, Santos et al. (2009) argue that BMI occurs when the firm engages in "reactivation" (altering the set of elemental activities that it offers to its customers),

"repartitioning" (altering the boundaries of the firm), "relocation" (changing the location of units currently performing activities), or "relinking" (altering the linkages among the organizational units that perform activities; see also Amit & Zott, 2012, for an architectural definition).

Dimensionalizing BMI. Progress in research often takes place when units of analysis are clearly dimensionalized—that is, when scholars manage to capture the heterogeneity of a unit of analysis in terms of its key characteristics that have relevant implications for outcomes. Our review and Table 3 suggest that, taken as a whole, the literature recognizes that BMIs may differ in terms of at least two dimensions. Thus, a first dimension that is invoked in the literature is the degree of novelty of the BMI. Some scholars highlight BMIs that are new to a firm (while not necessarily new to an industry; see Bock et al., 2012; Johnson, Christensen, & Kagermann, 2008; Osterwalder, Pigneur, & Tucci, 2005), whereas others stress BMIs that are new to an industry (Santos et al., 2009).

Another relevant dimension invoked in the literature is the scope of the BMI—that is, how much of a BM is affected by a BMI. Thus, at one extreme, the BMI may affect only a single component, such as the value proposition; at the other extreme, it may involve all components of the BM and the architecture that links those components. In fact, some scholars suggest that BMI can be manifest in a change in a single component of the firm's BM (e.g., Amit & Zott, 2012; Bock et al., 2012; Santos et al., 2009; Schneider & Spieth, 2013). Others allow for "one or more" components (e.g., Frankenberger et al., 2013; Sorescu et al., 2011), while some stress that "two or more" components must change (e.g., Lindgardt, Reeves, Stalk, & Deimler, 2009). Still others require an entirely novel combination of all BM components and the architecture linking them (e.g., Velamuri, Bansemir, Neyer, & Moeslein, 2013; Yunus et al., 2010). Overall, there is little agreement in the reviewed literature on the dimensionalization of BMI and, to our knowledge, no systematic analysis of such dimensionalization.

In sum, the BMI literature encompasses considerable differences in the definition and conceptualization of the key construct. This may be seen as a characteristic of an emerging research field that has not yet crystallized a "hard core" of key analytical constructs and assumptions regarding a new, puzzling phenomenon (Lakatos, 1970). While no new knowledge fields begin with clearly defined constructs or central assumptions but arrive at them through often painful and protracted trial-and-error processes, such "preparadigmatic" heterogeneity can be problematic because research efforts lack coordination and branch off in various directions, many of which will not be fruitful.

Gap 2: Congruence and Identifying Antecedents and Outcomes

Cumulative theorizing and successful empiricism require clear identification of the causal structure in a theory—that is, how the key constructs of interests are causally linked. Postulating certain cause-effect relationships involves unpacking the causal mechanisms at work (Fry & Smith, 1987). As a minimal starting point, BMI theorizing should clearly identify the antecedents and consequences of the focal phenomenon.

Antecedents of BMI. Relatively few articles of those we reviewed systematically theorize the antecedents of BMI. For example, BMI is said to be a necessary response to "strategic discontinuities and disruptions, convergence and intense global competition" (Doz & Kosonen, 2010: 370), competitive pressure or a shifting base of competition (Johnson et al.,

2008), or "major and unpredictable changes in the business environment, the increasing importance placed on innovation and knowledge as value-creating attributes, and the accelerating pace of the business environment" (Voelpel et al., 2004: 264), but such antecedents are not systematically linked to the BMIs they are seen as calling forth. Additionally, few studies have empirically tested the effect of different drivers on the propensity to engage in BMI (but see de Reuver, Bouwman, & MacInnes, 2009). Some studies describe BMI as an attempt to seize new opportunities introduced by the advent of, for example, specific digital technologies. Along these lines, some researchers focus on the influence of information and communications technologies on the emergence of new BMs in the context of e-commerce (Pateli & Giaglis 2005; Sabatier, Craig-Kennard, & Mangematin, 2012; Wirtz, Schilke, & Ullrich, 2010). However, such work is usually retrospective, case based, and inductive rather than predictive and theoretical (see Table 2, online supplemental material).

Effect of BMI on performance. In terms of the relation between BMI and firm performance, the presumed beneficial consequences of BMI are part of the motivation for the research of the majority of the articles that we reviewed. Thus, the literature recognizes that BMIs may be undertaken for a number of reasons, such as reducing cost, optimizing processes, introducing new products, accessing new markets, and, of course, ultimately improving financial performance. However, once invoked in the motivation, attention to those consequences often fade. In fact, few articles explain in detail how BMI improves competitive advantage, profitability, innovativeness, or other aspects of organizational performance (e.g., Aspara et al., 2010; Bock et al., 2012; Denicolai, Ramirez, & Tidd, 2014; Giesen et al., 2007; Wei et al., 2014; Zott & Amit, 2007; see Table 3, online supplemental material).

One reason for the low number of studies that look relatively rigorously at the performance consequences of BMI may lie in the sheer complexity of linking BMI and performance. If, for example, BMI affects the firm's value proposition, segments, value chain, and revenue model, then there are multiple complex links between BMI and performance—links that play out differently across time and may even be intertwined. It would be unrealistic to expect BMI research to empirically account for all such complicated mechanisms given the present state of development of the field. A starting point is to collect cross-sectional data on BM changes and regress those data against business or corporate performance. However, research designs that involve a temporal dimension and explicitly proffer identification strategies are preferable. While this recommendation is an ideal one that applies across the board to much management research, it seems particularly applicable to BMI research, because (a) the lag between BMI and performance consequences may be substantial, (b) a BMI may take a long time to implement, and (c) the links between BMI and ultimate financial performance are many and complex.

Gap 3: Contingency and Moderating Variables

Many contributions to the BMI literature point to the role of organizational capabilities, leadership actions, and learning processes in bringing about BMI, but other organizational variables are left out of the literature.

The role of organizational capabilities and leadership. Various organizational capabilities have been proposed as aiding firms in the transformation of their BMs. For example, Demil and Lecqoc (2010) point to the importance of developing "dynamic consistency,"

which they define as the capability to build and sustain firm performance while changing the BM. Achtenhagen et al. (2013) argue for the need for "critical capabilities" to support value-creation processes—including an orientation toward experimentation, a balanced way of using resources, clear leadership, a strong organizational culture, and employee commitment. Along similar lines, Doz and Kosonen (2010) highlight the importance of achieving "strategic agility" for accelerating BM renewal. These authors identify three metacapabilities that support the firm's achievement of strategic agility: strategic sensitivity, leadership unity, and resource fluidity (see Table 4 in the online supplemental material).

The role of learning and experimentation. The role of experimentation and learning has repeatedly been emphasized as a source of BMI (e.g., Achtenhagen et al., 2013; Andries & Debackere, 2013; Cavalcante, 2014; Doz & Kosonen, 2010; Eppler et al., 2011; Eppler & Hoffmann, 2012; McGrath, 2010; Sosna et al., 2010; Wirtz et al., 2010). For example, Andries and Debackere (2013) propose that firms can innovate their BMs through different modes—namely, commitment, incremental experimentation, or radical experimentation modes. As experience effects, complexity, and ambiguity influence the appropriateness of these different learning approaches, firms should consider changing their learning approaches over time to successfully renew their BMs.

The role of cognition. The role of cognition in managerial decisions related to BM change and innovation is increasingly in focus in the literature. Doz and Kosonen (2010: 371) argue that "business models stand as cognitive structures providing a theory of how to set boundaries to the firm, of how to create value, and how to organise its internal structure and governance." This view places managerial and organizational cognition at center stage in the understanding of BMI, because the latter must involve changes in managerial cognitive structures. For example, Aspara et al. (2013) use a case study of Nokia to demonstrate the important role that executives' cognitive processes can play in corporate BM transformation decisions (see Table 5 in the online supplemental material).

Other organizational factors. Other organizational factors, such as strategic flexibility (Bock et al., 2012; Schneider & Spieth, 2014), have been highlighted in recent BMI research. While Schneider and Spieth (2014) explore the impact of BMI on different dimensions of strategic flexibility (i.e., resource flexibility, coordination flexibility, and variety of managerial capabilities), Bock et al. (2012) investigate how culture and structure affect strategic flexibility during periods of BMI and how BMI efforts moderate those relationships. Moreover, the role of corporate-level strategy on the choice and flexibility of BMI at the business unit level is highlighted in Santos et al. (2009), while Markides (2013) and Khanagha, Volberda, and Oshri (2014) discuss the challenges of managing conflicting BMs simultaneously (i.e., ambidexterity; see Table 6 in the online supplemental material).

Organization design as a gap. While research highlights a number of organizational moderators and contingency variables, others are neglected. In particular, the role of organizational structure design in BMI is less understood. That is, while BMI is often defined in terms of changing components and/or the architecture of the BM, the extent to which organizational design and control mechanism need to be changed to support BMI and the extent

to which a BMI requires a new organizational design are issues that have only been touched on. Research suggests that firms that pursue new open innovation BMs must also implement new ways of "communication, rewarding employees for sharing and acquiring knowledge, and high levels of delegation of decision rights" (Foss, Laursen, & Pedersen, 2011: 980). In general, more research is required to understand the organizational design aspects of BMI.

Gap 4: Boundary Conditions

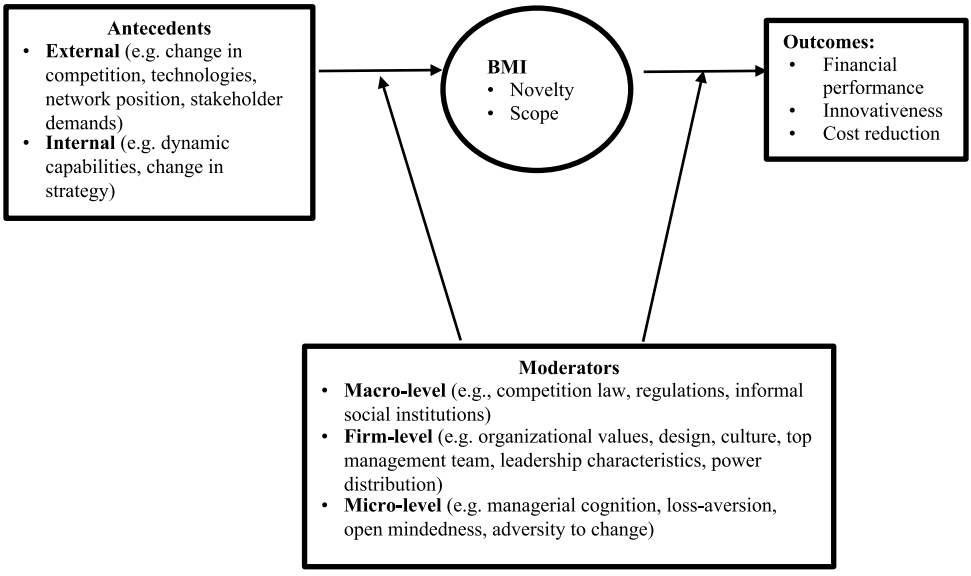
The BMI literature does not explicitly grapple with the issue of boundary conditions; yet, these are critical, as firms may differ with respect to the antecedents and consequences of BMI, depending on whether they are, for example, entrepreneurial, incumbent, high tech or traditional, young or old, and single industry or diversified. For example, while young, upstart firms may have the flexibility needed to engage in BMI, the performance effects of BMI may be more pronounced in older, established firms. BMI may be much harder to bring about in established firms, and it is perhaps not surprising that the initial empirical setting of BMI research was entrepreneurial firms (e.g., Zott & Amit, 2007, 2008). While research finds that BMI is an important vehicle for organizational transformation and renewal among incumbent firms (e.g., Demil & Lecocq, 2010; Doz & Kosonen, 2010; Dunford et al., 2010; Sosna et al., 2010), few studies compare BMI between incumbent and entrepreneurial firms (but see Bohnsack et al., 2014).

Only recently has the concept of BMI been applied in other research fields. In particular, the focus on BMI in relation to sustainability has gained momentum over the past year. As an increasing number of studies suggest that sustainability goals may call for BMI, researchers have investigated the factors and BM designs that can help companies achieve triple-bottom-line results—that is, social, environmental, and financial goals (e.g., Bocken, 2015; Bocken, Short, Rana, & Evans, 2014). Relatedly, the term *BMI* is often used to signify social innovations that facilitate inclusive growth (Spiess-Knafl, Mast, & Jansen, 2015; Yunus et al., 2010) or target low-income consumers (Anderson & Kupp, 2008; Sánchez & Ricart, 2010). Another important application relates to BMI in the field of service innovation or servitization. Similar to research on social innovation and sustainability, servitization (the shift from manufacture-to service-based BMs) is regarded as a fundamental shift in existing BM designs that has the potential to result in BMI (Nair, Paulose, Palacios, & Tafur, 2013; Visnjic Kastalli & Van Looy, 2013; Visnjic Kastalli, Van Looy, & Neely, 2013). However, the majority of these studies do not build on extant definitions of BMI but invoke BMI as a context for companies to change their existing ways of doing business (see Table 7, online supplemental material).

Advancing BMI Research

On the basis of our literature review and identification of gaps in BMI research, we now discuss establishing BMI as a clear, independent construct, as well as how the causal web in which BMI is situated (e.g., antecedent, moderating, mediating, and outcome variables) may be clarified, elaborated, and researched. Figure 2 shows our model of BMI. In the process of discussing how the gaps may be addressed and handled, we identify relevant theorizing, such as complexity theory (e.g., Levinthal, 1997; Simon, 1962), complementarity theory (Ennen & Richter, 2010), innovation theory (e.g., Henderson & Clark, 1990), dynamic capabilities

Figure 2
Research Model for Future Business Model Innovation (BMI) Research



theory (Teece, Pisano, & Shuen, 1997), and open innovation theory (Chesbrough, 2010; Chesbrough & Crowther, 2006).

Addressing Gap 1: Defining and Dimensionalizing the BMI Construct

In the long run, successful BMI research requires clarity regarding the core construct (cf. Suddaby, 2010). The natural place to start for a definition of BMI is the BM construct (cf. Markides, 2006). Teece (2010: 172) provides an often-cited definition of a BM as the architecture of the firm's mechanisms for creating, delivering, and capturing value, and a definition of BMI may usefully start from this definition, which, however, needs unpacking.

The "mechanisms for creating, delivering, and capturing value" reflect BM components that are well understood in the BM and BMI literatures—namely, value proposition, target segments, value chain organization, and revenue capture mechanisms—and are part of many definitions of a BM (see Table 3). However, a crucial part of Teece's definition is the notion of "architecture." A BM architecture is not a mere list of the firm's mechanisms for creating, delivering, and capturing value and the activities that enable these mechanisms (Santos et al., 2009). Rather, the architecture specifies the functional relations among those mechanisms and the underlying activities—the "fundamental organization of a system embodied in its components, their relationship to each other, and to the environment, and the principles guiding its design and evolution" (Maier, Emery, & Hilliard, 2001: 108). Such "relationships" may be described in terms of their degree of interdependence, or "complementarity" (Ennen & Richter, 2010). Some activities and the elements of the BM they support are more tightly linked than others.

Our literature review concluded that the BMI literature differs with respect to the nature of the unit of analysis—that is, BMI: Some place the emphasis on changes in the architecture of the BM (e.g., Santos et al., 2009), whereas others highlight changes in one or more components of the BM (typically, the value proposition) while paying smaller attention to the ramifications for other parts of the BM. However, both understandings of BMI are meaningful. Accordingly, we define a BMI as "designed, novel, and nontrivial changes to the key elements of a firm's BM and/or the architecture linking these elements." Ultimately, BMIs will require top-management action—hence, the requirement that BMI be designed. We impose the requirement of nontriviality to avoid including minor changes in, for example, supplier relations or product portfolio; we impose the requirement of novelty to avoid including the adoption/imitation of other incumbents' BMs. Our definition is grounded in complexity theory and in the empirics of innovation.

The notion that a BM architecture can be characterized in terms of the interdependencies among the firm's value creation, delivery, and capture mechanisms and the underlying activities suggests that BMs can be conceptualized as "complex systems" (Fleming, 2001; Levinthal, 1997; Simon, 1962, 1973). Simon (1962: 468) defines "complexity" as occurring when a number of parts "interact in a nonsimple way." Such complexity often takes the form of a system that is composed of interdependent (complementary) subsystems. We can think of BMs as forming such systems, with the value capture, delivery, and appropriation mechanisms constituting subsystems. In turn, such subsystems are composed of clusters of activities (Santos et al., 2009). While subsystems typically consist of highly interdependent activities, the degree of interdependence among subsystems may vary. Thus, Simon (1962: 473) explains that one may distinguish among (a) decomposable (or highly modular) systems, in which the interactions among the subsystems are negligible; (b) nondecomposable systems, in which the interactions among the subsystems are essential; and (c) nearly decomposable systems, in which the interactions among the subsystems are weak but not negligible. Change in a nondecomposable system inherently involves massive architectural change; change in a decomposable system may involve no architectural change but only changes in one or more constituent components, what may be called "modular" change. An important implication of complexity theory is that innovating a BM where the value creation, delivery, and appropriating mechanisms are tightly interdependent implies architectural change; conversely, a more loosely coupled BM will entail less architectural change but potentially much modular change. Thus, the scope of a BMI can be a matter of both architectural and modular changes.

Our review also noted that the literature differs with respect to the degree of novelty that is associated with a BMI. The innovation literature suggests that innovations are associated with different degrees of novelty. Thus, Schumpeter (1911) argued that innovations can be dimensionalized in terms of how novel they are, as reflected in the "new to the firm, industry, world" coding, as opposed to "new to the world" coding in the established empirical innovation literature (Dahlin & Behrens, 2005; for an application in the BMI context, see Zott & Amit, 2007). Some scholars argue that BMIs are new to a firm (while not necessarily new to an industry; see Bock et al., 2012; Johnson et al., 2008; Osterwalder et al., 2005), whereas others stress BMIs that are new to an industry (Santos et al., 2009).

Our definition and dimensionalization of BMI suggest the simple typology depicted in Figure 3, which dimensionalizes BMI in terms of "scope" (as measured in terms of the amount of architectural and modular change) and "novelty" (new to the firm and new to

Figure 3
Business Model Innovation (BMI) Typology

		Scope	
		Modular	**Architectural**
Novelty	**New to firm**	Evolutionary BMI	Adaptive BMI
	New to industry	Focused BMI	Complex BMI

the industry; see also Foss & Stieglitz, 2015). We can hence distinguish four types of BMI. Evolutionary BMI is akin to the idea of "a fine-tuning process involving voluntary and emergent changes" (Demil & Lecocq, 2010: 239) in individual components of the BM, often occurring naturally over time. Adaptive BMI involves changes in the overall BM that are new to the firm but not necessarily new to the industry (Saebi et al., 2016). These are cases where the firm adapts the architecture of its BM in response to changes in the external environment, as in the face of competition from a new BM in its industry (Teece, 2010). In contrast, focused BMI and complex BMI can be defined as the processes by which management actively engages in modular or architectural changes in the BMI to disrupt market conditions (i.e., new to the industry). In the case of focused BMI, the firm innovates within one area of the BM, such as targeting a new market segment that has been ignored by its competition. Hereby, the firm creates a new market while keeping its value proposition, value delivery, and value capture mechanisms intact. Thus, the innovation is limited to a modular change in the firm's BM. In contrast, complex BMI affects the BM in its entirety. Examples include traditional brick-and-mortar companies that shift toward becoming online platforms to facilitate the matching of customers and sellers of goods and services (e.g., as seen in the sharing economy). More empirical research is required to build a taxonomy of BMI and to understand the various interdependencies within the BMI during the transformation process.

Addressing Gap 2: Congruence and Identifying Antecedents and Outcomes

Antecedents of BMI. Our review revealed that there are few studies of the drivers or antecedents of BMI. Nevertheless, antecedents of BMI may be many, different in nature, and placed at different levels, and they can be internal or external to the firm. Studies on changing BMs highlight changes in the external environment, such as changing demands of stakeholders (e.g., Ferreira, Proença, Spencer, & Cova, 2013), changes in the competitive environment (e.g., de Reuver et al., 2009), and opportunities brought about by new information and communication technologies (e.g., Pateli & Giaglis, 2005; Wirtz et al., 2010). Given that BMI differs in terms of scope and novelty (see Figure 3), the antecedents for evolutionary or adaptive BMI might be different than for more complex forms of BMI. The relevance and relative importance of these external antecedents to different kinds of BMI ultimately form an empirical question.

Furthermore, in spite of attention to the managerial side of BMI, there are still significant gaps in the understanding of the internal drivers of BMI. Literatures that are helpful for developing new insight into the internal antecedents of BMI are the dynamic capabilities

(Teece, 2007; Teece et al., 1997) and open innovation (Chesbrough, 2010; Chesbrough & Crowther, 2006) literatures. Thus, the ability to innovate the BM in response to major changes in the external environment may be a key dynamic capability (Zott et al., 2011). Teece (2007: 1348) argues that dynamic capabilities can be decomposed into the "capacity (1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets." The distribution of attention across, and the readiness to take action across, the corporate hierarchy, as captured by sensing, shaping, and seizing opportunities, represent possible antecedents of BMI. The open innovation literature, in turn, often directly links BMs and open innovation so that specific kinds of open innovation require specific BMs (Saebi & Foss, 2015). This further highlights the close interrelationship between a firm's strategy and its underlying BM. As BMs need to match the firm's overall strategy (Magretta, 2002; Zott & Amit, 2008), a shift in a company's strategy (e.g., toward open innovation) requires a change in its BM as well.

Outcomes of BMI. Many contributions to the BM literature argue that BMs can be important factors driving firm performance (see Dunford et al., 2010). Thus, certain value propositions addressed at specific customer segments may be associated with a particularly high willingness to pay; value chain organization and other aspects of organization may contribute to low costs; and particular revenue models may mean that the firm is in a position to appropriate a sizable portion of the created value. Such combinations of value creation, delivery, and appropriation mechanisms may be thought of as valuable resources in that they give the firm the potential to create and appropriate more value than the competition, which leads to a competitive advantage (Peteraf & Barney, 2003).

As some types of BMs outperform others (see Weill et al., 2005; Zott & Amit, 2007, 2010), successful BMs are viewed as examples to be imitated (see Baden-Fuller & Morgan, 2010; Chesbrough, 2010; Teece, 2010) or replicated (Doz & Kosonen, 2010; Winter & Szulanski, 2001). However, because of the social complexity and path dependence that may be associated with a BM/BMI, such a competitive advantage may be sustainable in the sense of the resource-based view (Barney, 1991). BMI that involves several tightly coupled elements is more likely to be a source of sustained competitive advantage than more loosely coupled BMI, because the level of causal ambiguity is higher in the former than in the latter case (Porter & Rivkin, 1998). However, such BMI also raises a number of challenges. First, because of the inherent complexity that many interacting elements represent, it is not easy to forecast the true performance implications of internal changes (Rivkin, 2000). Second, such BMI is more prone to inertia in the long run. Thus, even if tightly coupled BMI cannot be imitated (for a reasonable cost), it may still become obsolete as rivals implement more successful BMI. Firms may therefore struggle to keep up in the competitive game if they are saddled with tightly coupled BMs. In contrast, "loosely coupled organizations . . . are responsive to change, but vulnerable to imitation" (Rivkin, 2000: 843), which introduces important managerial tradeoffs between inertia and imitation.

Addressing Gap 3: Contingency and Moderating Variables

While many of the above factors may bring about BMI, there are many factors at various levels that may moderate the strength of this effect. The number of potential moderating factors is large, so here we focus on only select potential moderators.

Macrolevel moderators. Informal and formal social institutions may influence the ease with which firms can engage in BMI. For example, some BMI may involve acquisitions, laying off parts of the workforce, moving to electronically mediated methods of payment, or relying more on external suppliers. The feasibility of such moves is influenced by competition law, labor market legislation, legislation concerning privacy and Internet security, and generalized trust, respectively. Institutional theory, broadly conceived, has potentially much to offer with respect to understanding how the institutional matrix constrains and enables BMI—for example, by giving legitimacy to certain kinds of BMI rather than other kinds. For example, the sharing economy provides an illustrative case where the expansion of BMs of companies such as Uber (transportation) or Airbnb (accommodation) is severely hampered by the country's competition law, as these BMs are considered disruptive to the traditional incumbents in their industries.

Firm-level moderators. An intermediate set of moderators is represented by firm-level variables, especially organizational values, organizational culture, and organizational design. Changes in BMs may clash with shared mental models and shared assumptions. For example, Foss, Pedersen, Pyndt, and Schultz (2012) show how a change in the BM of the toy producer Lego toward (among other things) more user involvement in development clashed with what was effectively a culture that stressed internal development. Even though George and Bock (2011: 99) argue that a "business model is the design of organizational structures to enact a commercial opportunity," Foss and Saebi (2015) argue that the role of organizational design has been almost completely neglected in BMI research. Nevertheless, organizational design would seem to be strongly intertwined with BMI. Thus, the firm's organizational design may be partly endogenous to BMI, as successful implementation of BMI may require corresponding changes in the organizational design—that is, the structuring, coordination, and motivation of work, as well as the setting of objectives and the allocation of resources. In other words, changes may be required in a substantial part of the firm's organizational design.

Microlevel moderators. At the lowest level of aggregation, the characteristics of employees in terms of human capital, skills, and psychology (motivation, engagement, etc.) can influence the ease with which a BM is innovated, as well as the link between BMI and firm-level performance. For example, over time employees may come to view their existing hierarchical positions and the associated rights and privileges as endowments (Heath, Knez, & Camerer, 1993). BMI that challenges such positions may lead to more or less subtle resistance among employees. Relatedly, BMI produces both winners and losers internally. The phenomenon of loss aversion implies that losses are disproportionately more heavily weighted than gains in individuals' gain-loss calculations, implying that those who lose from BMI may be expected to be disproportionately more negative toward BMI than those who gain will be positive.

Managerial cognition represents a particularly important microlevel moderator. First, managers are often the first to perceive and interpret the changes that may call for an innovation of the BM. Second, the authority to implement the changes that amount to a BMI resides with managers, and their interpretation of what is necessary to do is therefore particularly decisive. In a recent study of the drivers of BM change, Saebi et al. (2016) argue that managerial cognition related to changes in the environment can be divided into negative (i.e., threat-oriented)

or positive (i.e., opportunity-oriented) framing of events, and they find that firms are more likely to change their BMs under conditions of perceived threats than opportunities.

Managerial cognition may be systematically linked to BMI by means of complexity theory (Levinthal, 1997; Rivkin, 2000). Thus, changes that suggest the need for a BMI may give rise to a managerial process of search in the space of combinations of BM components (and their underlying activities). The topography of this space, or "landscape," depends on how strongly interdependent the components of a BMI are: If they are highly interdependent (the entire architecture has to change), the landscape has multiple peaks, whereas a more loosely coupled BMI (e.g., only some activities underlying value delivery have to change) implies a smoother landscape (Levinthal, 1997).

Complexity theory suggests that managers are likely to use very different heuristics when searching over landscapes that are rugged than when they search in landscapes that are not rugged (Rivkin, 2000). In the latter case, simple trial-and-error heuristics will suffice, as they will bring the firm to the single peak in the landscape with certainty. However, if the landscape is rugged, such simple searching may lead the firm to choose a low peak, which means BMI with low profitability implications. Therefore, management will have an incentive to develop a mental model of the landscape to understand the set of BMI that the firm can implement and the associated levels of profitability.

This links to the notion that there is a cognitive dimension to BMs. BMs represent management's conjecture or theory about what customers want, how that value should be delivered, and how value should be captured (Teece, 2010). The formation of such conjectures and their implementation as concrete BMI raise several top-management challenges. One is an attention challenge. Novel BMI of a broad scope is more demanding of managerial attention than BMI with the opposite characteristics because it requires a more intensive and concerted search effort by the top management team (Ocasio, 1997).[7]

Addressing Gap 4: Boundary Conditions

Our review on the boundary conditions of BMI revealed a number of interesting fields of applications, such as sustainability, servitization, open innovation, and dynamic capabilities (see Table 7 in the online supplemental material). We also highlight the close interrelationship between BMI and entrepreneurship, which has not received sufficient attention to date.

Entrepreneurship and BMI. Entrepreneurship is intrinsically linked to BMI: For start-ups, any act of entrepreneurship means the choice of a BM, while in established firms the exercise of entrepreneurial judgment results in changes in the BM's components or architecture. As BMs reflect management's hypotheses about what the customers want and how the firm can organize best to create, deliver, and capture value (Teece, 2010), BMI is tightly linked to the idea of entrepreneurial vision, imagination, and judgment (Foss & Saebi, 2016). In a review of the rise of the BM and entrepreneurship literatures, Foss and Saebi (2016) find that studies predominantly refer to BMI in the context of innovative start-ups (i.e., BMI as an outcome), but they do not shed light on the process of BMI—that is, what facilitates and hinders BMI in entrepreneurial firms, and how are these different from incumbent firms? Furthermore, building on such studies by Cucculelli and Bettinelli (2015) and Zott and Amit (2007), more research is needed on the performance implications of BMI in entrepreneurial firms.

Open innovation and BMI. As mentioned, the open innovation literature often directly links BMs and open innovation. In fact, open BMs facilitate the integration and commercialization of external resources (Chesbrough & Crowther, 2006; Laursen & Salter, 2006) and hereby present a new form of value capture. However, as Randhawa, Wilden, and Hohberger (2016) point out, an important question is how firms can align open BMs with the outcomes of value creation and value capture. Furthermore, as firms increasingly depend on external sources of resources and capabilities, adopting a network or open system perspective (Berglund & Sandström, 2013) becomes imperative. Specifically, as Berglund and Sandström (2013) point out, more research is needed not only on the intrafirm challenges to BMI (e.g., managerial cognition, experimentation) but also on the intersecting and conflicting demands in these network relationships that pose constraints on the ability of the focal firm to innovate its BM and to appropriate value from external resources.

Servitization and BMI. *Servitization* refers to the integration of service components into the firms' range of activities, and it often reflects a shift from selling products to selling integrated products and services that deliver value in use (Baines, Lightfoot, Benedettini, & Kay, 2009). Adopting a service-dominant logic (Karpen, Bove, & Lukas, 2012; Vargo & Lusch, 2004), servitizition can be argued to be an important driver of BMI, where, for example, the shift from service for free to service for fee introduces important changes to the firm's value appropriation (Witell & Löfgren, 2013). Furthermore, with the exception of a few studies (e.g., Kindström, 2010), little is known about how a shift toward service-driven BMs affects the firm's existing BM and its underlying organizational design and structure to support the new BM.

Sustainability and BMI. The need for greater sustainability (e.g., social, environmental) can be considered a major antecedent of BMI. The popularity of the sharing economy or collaborative consumption has given to innovative forms of BMs that facilitate the exchange of underutilized assets among individuals (e.g., Airbnb, Zipcar, Rent the Runway). Similarly, the need to facilitate inclusive growth (Spiess-Knafl et al., 2015; Yunus et al., 2010) or target low-income consumers (Anderson & Kupp, 2008; Sánchez & Ricart, 2010) can result in significant BMIs. As the majority of these studies either emphasize the need for sustainability or describe sustainable BMs, the question of how managers can innovate their BMs toward greater sustainability has not been addressed sufficiently to date. Thus, a more explicit and systematic use of the BMI construct is warranted to further this research field.

Conclusions

BMs and the innovation thereof have become prominent topics in macromanagement discussions over the last few decades. While the BM and BMI streams of literature have an obvious relation to the strategy field, they have thus far lacked explicit anchoring in any particular (macro-)management field. Perhaps not surprising, our review revealed considerable conceptual ambiguity in the BMI literature (see Table 3). In addition, we were able to discern four main streams of BMI research (Table 2) that exist relatively separately and do not seem to support one another in a process of cumulative growth of knowledge. In sum, our review revealed or confirmed, depending on one's preconceptions, that the BMI literature is characterized by conceptual ambiguity and disconnected research efforts.

To advance the BMI literature, we proposed a conceptualization (and dimensionalization) of BMI that draws from the innovation literature and from the literature on complex systems. This anchors BMI in clearly defined literature streams with distinct insights. Additionally, it directs attention to the managerial challenges of BMI. Thus, BMI gives rise to different challenges depending on its radicalness and scope. Relatedly, BMI can have different outcomes and responses to antecedents depending on its radicalness and scope. The highest priority should be given to gaining clarity on what is actually meant by BMI, because this influences the anteceding, mediating, and moderating variables that we include in research models of BMI and how we assess the outcomes of BMI.

Currently, the BMI literature manifests an important attempt to grapple with a puzzling and complex reality that represents real challenges to practitioners. It involves suggestive but often ill-defined concepts that are fuzzy at the edges, as is characteristic of emerging fields. Simplification, conceptual clarification, theoretical models, and cumulative empirical work are called for. This should start from an identification of key conceptual, theoretical, and empirics-related gaps—the filling of which can be argued to advance the literature. We hope that the present article, in addition to reviewing the literature, has successfully laid out feasible research avenues that are attractive to scholars interested in BMI.

Notes

1. We are grateful to an anonymous reviewer for this point.

2. These results were generated January 15, 2016. Scopus—the largest abstract and citation database covering peer-reviewed literature—is provided by Elsevier.

3. These include recent special issues of *Long Range Planning* (2010, 2013), *International Journal of Innovation Management* (2013), *International Journal of Product Development* (2013), *R&D Management* (2014), and *Strategic Entrepreneurship Journal* (2015), as well as special issues of more practitioner-oriented publications, such as *MIT Sloan Management* (2012) and *Harvard Business Review* (July/August 2014).

4. Search results were generated on August 30, 2016.

5. Specifically, the following articles (n = 18) were included from these additional searches: Achtenhagen, Melin, and Naldi (2013); Cavalcante (2014); Dmitriev, Simmons, Truong, Palmer, and Schneckenberg (2014); Eppler and Hoffmann (2012); Girotra and Netessine (2014); Johnson, Christensen, and Kagermann (2008); Johnson (2010); Kim and Min (2015); McGrath (2010); Moingeon and Lehman-Ortega (2010); Osiyevskyy and Dewald (2015); Pateli and Giaglis (2005); Poisson-de Haro and Montpetit (2012); Santos, Spector, and Van der Heyden (2009); Smith, Binns, and Tushman (2010); Voelpel, Leibold, and Tekie (2004); Wei, Yang, Sun, and Gu (2014); Wirtz, Schilke, and Ullrich (2010).

6. A suggestion for future research would be to use more quantitative methods, such as co-citation and text mining (see for example Randhawa, Wilden, & Hohberger, 2016).

7. A related challenge but more in the nature of a moderating factor is the power challenge. Business model innovation (BMI) that is radical and broad in scope risks challenging more organizational power positions than BMI with the opposite characteristics. Such BMI challenges organizational members' perceived endowments and may make some organizational members redundant. It may therefore be resisted at the organizational level. Moreover, at the level of the higher echelons of the firm, BMI that is novel and broad in scope requires that top managers be able to overcome fault lines stemming from conflicts of interest and power positions and to act in concert.

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