



Business models and business model innovation: Between wicked and paradigmatic problems



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A B S T R A C T

While research on business models and business model innovation continue to exhibit growth, the field is still, even after more than two decades of research, characterized by a striking lack of cumulative theorizing and an opportunistic borrowing of more or less related ideas from neighbouring fields in the place of cumulative theory. We argue that the lack of cumulativeness stems from lack of construct clarity (i.e., BM and BMI are seldom defined with much precision) and lack of agreement on definitions, which in turn imply that the core constructs are not dimensionalized in a way that eases theory-building and empirical testing. Lack of progress on these matters partly reflect that the BM and BMI constructs are used in multiple explanatory contexts, so that it is not entirely clear what are the problems that BM and BMI research seek to solve. We argue, with Teece (2010), that the BM and BMI constructs are fundamentally about the architecture of the firm's value creation, delivery and capture mechanisms; theoretically the key aspect of BMs is complementarity between activities underlying these mechanisms; BMI means novel changes of such complementary relations; and this understanding not only unifies diverse contributions to the literature but is also productive of new insight.

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Introduction

This special issue represents yet another strong indication that research on business models and business model innovation is attracting very significant attention, not just from the business community, but also increasingly from various research communities, mainly in strategy, but also in, for example, technology management, international business and sustainability. Thus, as Foss and Saebi (2017) show, research on business models (BM) has increased significantly, reaching 7391 publications in the Scopus database for the period 1980–2015. While research on business model *innovation* (BMI) thus far only amounts to 349 publications, it is rapidly increasing (Foss and Saebi, 2017).¹

This growth underscores that research interest in a phenomenon is perhaps particularly likely to happen and increase when the phenomenon is broadly seen as highly important, ill-understood, but the problem of understanding it is not so badly defined or ill-structured that inquiry seems near hopeless, as in the case of “wicked” problems (Buchanan, 1992) (e.g., some of the problems that attach to the understanding of consciousness; Rittel and Webber, 1973). Scholars often impose structure on ill-structured problems (i.e., problems that have no well-defined ends, means, causal relations between variables, objective functions) by borrowing constructs and insights from neighbouring fields (cf. Simon, 1973). In fact, many critics of the BM and BMI constructs have argued that ultimately these constructs amount to little more than a repackaging of well-understood strategy insights (e.g., Arendt, 2013; Porter, 2001; see the discussion in Massa et al., 2016). We disagree with this critical stance (see Foss and Saebi, 2015, 2017), and submit that BM and BMI are still to large extents phenomena in search

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¹ These numbers are based on Scopus searches for the terms “business model” and “business model innovation” in the search field “abstract, title, keyword” within the field of “social sciences and humanities”. The number of publications reported refers to peer reviewed and non-peer reviewed articles for the period 1980–2015.

of theory, or, more precisely, *cumulative* theory (and cumulative empirics) with more “paradigmatic” problem-solving in the manner classically described by [Kuhn \(1970\)](#).

Thus, over the last fifteen years, *at least* the following theories have been applied to the understanding of BM and BMI: Dynamic capabilities ([Leih et al., 2015](#)), threat rigidity and prospect theories (see [Saebi et al., 2016](#)), entrepreneurship theory (see [Foss, Saebi & Stieglitz, 2016](#); [George and Bock, 2011](#)), TCE ([Zott and Amit, 2010](#)), RBV or Penrosian view of the firm ([Mangematin et al., 2013](#)), applied to the understanding of BM and BMI in the context of learning (e.g. [Sosna et al., 2010](#)), managerial cognition (e.g., [Tikkanen et al., 2005](#)), performance (e.g., [Amit and Zott, 2001](#); [Zott and Amit, 2008](#); [Kim and Min, 2015](#)), innovation (e.g., [Chesbrough and Rosenbloom, 2002](#)), replication (e.g., [Winter and Szulanski, 2001](#)), and competition (e.g., [Casadesus-Masanell and Feng, 2013](#); [Velu and Jacob, 2014](#)).

However, in spite of all this experimentation and application, the BM and BMI research streams have produced little agreement on key issues. In fact, there is still surprisingly little agreement on what is the nature of the unit(s) of analysis, that is, what BM and BMI *are*. Recent discussions and reviews of the BM and BMI literatures have all made this point ([Zott et al., 2011](#); [Foss and Saebi, 2017](#); [Wirtz et al., 2016](#); [Massa et al., 2016](#)). These papers show that the definitional variety is quite overwhelming and it is not clear if these diverse definitions are mutually consistent. Some are also highly unclear. Given this definitional variety and the lack of clarity that attaches to the units of analysis, it is perhaps not surprising that BM and BMI research has produced few models that lay out a clear causal structure with exogenous variables, parameters and endogenous variables (whether the BM and BMI themselves or the outcomes of BM and BMI). Thus, as [Wirtz et al. \(2016: 37\)](#) surmise, “there is still no complete clarity in the literature, in particular about the purpose or the right of the business model approach to exist, or even the contrast to established concepts”. They attribute this ambiguity to the fragmented nature of the literature, its historical development as well as diverging views of researchers.

A further, and perhaps deeper problem, we submit, is that we may not have a good idea of what we want our units of analysis (i.e., BM and BMI) to do for us, resulting in notions of BM and BMI that are put to rather different explanatory purposes such as: “(1) attributes of real firms variously influencing their performance in markets, (2) cognitive schemas (and linguistic schemas as observable manifestations), and (3) formal (scaled-down) conceptual representations of organizational activities” ([Massa et al., 2016: 28](#)).

Compare this with a social science success story, namely that of transaction cost economics. Initiated by Ronald [Coase \(1937\)](#), TCE didn’t take off until the mid-1970 in terms of cumulative development. The reason was that although Coase clearly had pointed to a truly fundamental explanatory gap (i.e., why firms exist), he didn’t formulate a problem-oriented approach to filling the gap in a sufficiently operational way. That was left to, mainly, Oliver [Williamson \(1975, 1985, 1996\)](#), who made TCE fundamentally researchable and cumulative by clearly defining a unit of analysis (i.e., the transaction), dimensionalizing it (i.e., the frequency, uncertainty and asset specificity triad), and linking the unit to outcomes (i.e., governance structures), using a clear discriminatory principle (i.e., transaction cost economizing). He also identified the “paradigmatic” problem of TCE, namely that of explaining vertical integration. The rest is history—which concretely means cumulative theory-building and a massive amount of empirical TCE studies ([Tadelis and Williamson, 2012](#)). Notice how the explanatory purpose of the theory, the unit of analysis, is dimensionalized, and the role it plays in the theory are all tightly integrated.

Although the analogy is by no means perfect, there is a need for a similar undertaking in the case of BM and BMI research, that is, some agreement on the nature of the unit of analysis, how that unit may be dimensionalized, causal mechanisms linking BM and BMI to antecedents and outcomes, and some central problems that research should address. The purpose of this essay is not to deliver on something so ambitious. Rather, we more modestly hope to contribute to the emergence of a discussion of what are the nature of the phenomenon we seek to study and how we best approach it, so as to move BM and BMI research away from the “wicked” end of the continuum of problem-solving and more towards the “paradigmatic” end. To this end, we elaborate on the idea of BMs as the architecture of activities and hereby show how complementarity is the key dimension of the BM construct. This further allows us to dimensionalize BMI in terms of scope (architectural vs. modular change) and novelty (new to firm vs. new to industry), which is productive in the examination of the antecedents, moderators and consequences of BM and BMI.

The unit(S) of analysis

The importance of construct clarity

BM and BMI are not directly observable. We observe specific constellations of activities dedicated to value creation, delivery and appropriation and have decided to call these constellations “business models” and changes in them “business model innovation.” Thus, BM and BMI are, of course, conceptual abstractions, theoretical constructs. Ideally, we want such constructs to create cognitive order out of the “booming, buzzing, confusion” of the business world by offering “robust categories that distill phenomena into sharp distinctions that are comprehensible to a community of researchers” ([Suddaby, 2010: 346](#)). Good theorizing is based on the creation of this kind of cognitive order. If our constructs are unclear and possibly overlapping, we will also likely get causality and mechanisms wrong. Empirics will also suffer from this. Lack of construct clarity does not mean that we won’t get research. In fact, we may get plenty of it. Research on BM and BMI is fairly voluminous (see [Foss and Saebi, 2017](#)), yet this research has been building for about two decades in the absence of clear definitions of the central constructs. As [Zott et al. \(2011: 4\)](#) note:

At a general level, the business model has been referred to as a statement (Stewart and Zhao, 2000), a description (Applegate, 2000; Weill and Vitale, 2001), a representation (Morris et al., 2005; Shafer et al., 2005), an architecture (Dubosson-Torbay et al., 2002; Timmers, 1998), a conceptual tool or model (George and Bock, 2009; Osterwalder et al., 2005), a structural template (Amit and Zott, 2001), a method (Afuah and Tucci, 2001), a framework (Afuah, 2004), a pattern (Brousseau and Penard, 2006), and a set. Surprisingly, however, the business model is often studied without an explicit definition of the concept.

No doubt, the reader can think of other examples from management research. A research area may even grow exactly because the core constructs are unclear and fuzzy at the edges and when these constructs seem to the research community to capture real, important phenomena. The reason is that fuzzy core constructs allow for more explorative efforts, since researchers do not have to use and coordinate on established terminology, insights, and so on (Kuhn, 1970). It is thus quite arguable that BM and BMI research has been successful in terms of the sheer number of research contributions exactly because there has been something of an “anything goes” approach to the field.

However, while such exploration can be useful as the research communities search across a landscape of different terminology, perspectives, insights, predictions, and so on, cumulateness in research requires a shakeout of a number of the different perspectives, and a consolidation around a few key ideas. These ideas include agreement on what are the relevant problems one seeks to address and solve, the key variables involved in building theory that can address these problems, the way such variables are typically linked, and instances of successful problem-solving (i.e., “examplars”; Kuhn, 1970). However, these things are difficult to agree on if there is not even some basic pre-existing agreement on what is the nature of the unit of analysis.

The endless (and still not fully resolved) discussions around ascribing actorhood to firms, and the lack of clarity regarding macro constructs such as firm capability illustrate these problems. For example, cumulative theorizing as well as empirical work on capabilities has been hampered by the absence of clear definitions of this construct (Felin and Foss, 2005).

Much of the lack of clarity in the BM and BMI research space can be traced to the history of emergence of research on BM and BMI. These constructs were first being used in practice as handy if vague ways of capturing the systemic aspects of businesses and how these aspects change, and BM and BMI continue to be used in an often *atheoretical* way. Second, when scholars began to take an interest in bolstering them in the research dimension, this was often done in a fairly opportunistic way. For example, the conceptual underpinnings of the so-called “business model canvas” are various parts of strategic management theory (Osterwalder and Pigneur, 2010) that each underpin a particular aspect of the “canvas” in a kind of “available-tools” approach. However, there is an unexamined assumption that these different pieces of theory are coherent/consistent. That may not be the case: The theories that we apply to the understanding of, for example, resources, customer segments, channels, key partners, etc. are simply widely different, and there is no *a priori* guarantee that they “add up.”

Additionally, the problem is that this way of building theory risks disregarding important foundational issues, such as what is really the nature of a BM and BMI and how it should be conceptualized, using rigorous theory. For example, are we really sure that there are nine different components of a BM (Osterwalder and Pigneur, 2010)? What exactly are the compelling theoretical reasons that make us think so?

Opportunistically linking heterogeneous theory together may very well be better than nothing, after all much management theory has historically developed in this way, and the Osterwalder oeuvre may have served many companies well as a useful way of categorizing (and visualizing) key elements of how firms create, deliver and capture value. However, categorization is only a first start. A further important challenge is to develop “clearly articulated research models that lay out the basic causal web connecting antecedent, moderating, and mediating variables” with the BM and BMI constructs (Foss and Saebi, 2017: 203).

Elements of construct clarity

In a highly illuminating discussion of construct clarity, Suddaby (2010: 347) suggests that construct clarity has four dimensions or elements:

First, definitions are important. Construct clarity involves the skillful use of language to persuasively create precise and parsimonious categorical distinctions between concepts. Second, construct clarity requires the author to delineate the scope conditions or contextual circumstances under which a construct will or will not apply. Third, not only must the theorist offer clear conceptual distinctions, but he or she must also show their semantic relationship to other related constructs. Finally, the theorist must demonstrate a degree of coherence or logical consistency of the construct in relation to the overall theoretical argument he or she is trying to make.

It is easy to demonstrate that BM and BMI research is not quite up to snuff in the department of construct clarity. Consider Suddaby’s four points as applied to BM and BMI research.

The left hand side of Table 1 shows a number of BM definitions, most of which outline many, heterogeneous elements that have relatively little in common, except that they somehow collectively integrate the purpose of the firm and its strategy.

In fact, Shafer et al., (2005) surveyed 12 different definitions of BM in established publications during 1998–2002, which together produced a list of forty-two different BM components, elements or building blocks. More recently, Clauss (2016) reviewed the BM literature from 2002 to 2014 revealing 73 semantically different business model components in the literature! This heterogeneity of the BM construct does not allow generating a unified theory of BMs, because it is unclear how

Table 1
Selected definitions of BM and BMI.

Business models (static)	Business model dynamics/innovation
A business model is “an architecture for the product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; a description of the sources of revenue” (Timmers, 1998)	Business model evolution , “a fine tuning process involving voluntary and emergent changes in and between permanently linked core components” (Demil and Lecocq, 2010, p.239)
A business model “depicts the content, structure and governance of transactions designed so as to create value through the exploitation of business opportunities” (Amit and Zott, 2001)	Business model learning , an established firm modifies its business model in face of competition from a new business model (Teece, 2010)
A business model “creates the heuristic logic that connects technical potential with the realization of economic value” (Chesbrough and Rosenbloom, 2002)	Business model erosion , the declining competitiveness of established business models (McGrath, 2010)
A business model “answers Peter Drucker’s age-old questions: Who is the customer? And what does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?” (Magretta, 2002)	Business model lifecycle , “involving periods of specification, refinement, adaptation, revision and reformulation. An initial period during which the model is fairly informal or implicit is followed by a process of trial-and-error, and a number of core decisions are made that delimit the directions in which the firm can evolve” (Morris et al., 2005, p. 732)
A business model “is a concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture and economics are addressed to create sustainable competitive advantage in defined markets.” (Morris et al., 2005)	Business model transformation . “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.” (Aspara et al., 2013, p. 460)
A business model “articulates the logic, the data and other evidence that support a value proposition for the customer, and a viable structure of revenues and costs for the enterprise delivering that value.” (Teece, 2010)	Business model innovation . “the discovery of a fundamentally different business model in an existing business” (Markides, 2006, p.20)
A business model “is a reflection of the firm’s realized strategy.” (Casadesus-Masanell and Ricart, 2010)	Business model innovation . “initiatives to create novel value by challenging existing industry-specific business models, roles and relations in certain geographical market areas” (Aspara et al., 2010, p.47)
A business model is “a system of interdependent activities that transcend the focal firm and spans its boundaries (Zott and Amit, 2010)	Business model innovation . “refers to the search for new logics of the firm and new ways to create and capture value for its stakeholders”
Business models are “a simplified and aggregated representation of the relevant activities of a company. It describes how marketable information, products and/or services are generated by means of a company’s value-added component. In addition to the architecture of value creation, strategic as well as customer and market components are taken into consideration, in order to achieve the superordinate goal of generating, or rather, securing the competitive advantage.” (Wirtz et al., 2016)	Business model innovation “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.” (Khanagha et al., 2014: 324)

Source: adapted from Foss and Saebi (2017) and Saebi et al. (2016).

business model elements such as value proposition, target segment, revenue mechanisms, value chain organization and internal organization can be aligned in theoretical terms (Foss and Saebi, 2015, 2017).

Regarding BMI, the right hand side of Table 1 shows various definitions associated with business model dynamics or change, such as business model “learning”, “evolution”, “modification”, “reconfiguration”, “innovation”, or “renewal” (cf. Doz and Kosonen, 2010; Demil and Lecocq, 2010; Dunford et al., 2010; Teece, 2010). Often used interchangeably, some of these concepts seem to point to incremental changes occurring in existing business models (i.e. evolution, adaptation), while other definitions seem to refer to more radical forms of innovation.

In sum, while plenty definitions of BM and BMI are offered, it is simply unclear whether they point towards the same phenomena.

Second, in general scope conditions are seldom or never offered in the literature. It is not clear, for example, if the literature embodies a claim that *any* firm has a business model or whether a business model is the outcome of a specific design exercise. Additionally, with various levels of abstraction applied to the BM concept - ranging from product level, business unit level, corporate level to the aggregative industry level of analysis (for a review, see Wirtz et al., 2016) - the confusion regarding scope conditions persists. Relatedly, the issue is seldom raised whether a business model is strictly a business unit property, or if it can also be a corporate level property proper (and, if so, what is the relation between the business and the corporate model?) (but see Casadesus-Massanel et al., 2015, for one of the very few discussions of this).

Third, while the semantic closeness between BM, BMI and key ideas in business and corporate strategy has often been noted (for a discussion on this see Massa et al., 2016), precisely what are the relations between these remain unclear, causing continuing skepticism whether BM and BMI research truly adds substantive points beyond existing strategy thinking. For example, is a BM more than a competitive strategy backed up by an appropriately chosen resource bundle organized within a certain administrative framework? If so, this sounds very much like mainstream strategy thinking. Is BMI more than another manifestation of the operation of dynamic capabilities? Etc. Any participants in sessions, seminars, etc. on BM and BMI will recognize these kinds of semantic and definitional issues.

Finally, the precise role of BM or BMI in “relation to the overall theoretical argument” is often not made clear, that is, what exactly are the explanatory roles of BM and BMI arguments in a larger explanatory context. Is the primary purpose of the BM and BMI constructs to add to the understanding of the sources of sustained competitive advantage (e.g., Chesbrough, 2010)? Is it to highlight the systemic nature of businesses, and hence the difficulties of renewing them? Is it to direct attention to a new source of innovation (e.g. Teece, 2010)? Before we discuss what we want our definitions of BM and BMI to do for us, we take stabs at defining and dimensionalizing BM and BMI. We then show that these definitions are capable of handling diverse explanatory tasks where BM and BMI may be dependent variables and independent variables, respectively.

Towards unifying and generative definitions

Recently, we find that a number of scholars proffer definitions of BM and BMI that add to cumulate theory building by stressing the *architecture* of activities underlying the firm's creation, delivery and appropriation of value (Santos et al., 2009; Teece, 2010; Zott and Amit, 2010; Foss and Saebi, 2017). As we have argued elsewhere (Foss and Saebi, 2015, 2017), Teece's (2010) now widely cited definition of a business model as the architecture of the firm's value creation, delivery and appropriation mechanisms provides the basis for a much needed dimensionalization of the BM and BMI constructs. The key, but often overlooked or not understood, part of Teece's definition is the notion of “architecture.” An architecture is not a list of the firm's mechanisms for creating, delivering, and capturing value, but a mapping of the functional relations among those mechanisms and the underlying activities.² More specifically, an architecture is the set of relations among elements in a system (Simon, 1969), where these relations can be characterized in such terms as directionality (i.e., are relations sequentially or reciprocally dependent?), complementarity/strength, and content (notably, information content, i.e., is the BM supported by strong or weak information flows? Where?). The architecture can in turn be characterized in terms of complexity (Foss and Stieglitz, 2015). Relatedly, Santos et al., (2015) argue that a BM is more about “how is it being done?” than “what is being done?,” “what is the segment being addressed?,” and “how is revenue being captured?” Thus, it is about the activity architecture controlled by a firm. And Amit and Zott (2012: 42) argue that a BM is.

A system of interconnected and interdependent activities that determines the way the company “does business” with its customers, partners and vendors. In other words, a business model is a bundle of specific activities — an activity system — conducted to satisfy the perceived needs of the market, along with the specification of which parties (a company or its partners) conduct which activities, and how these activities are linked to each other.

Other authors who stress system or architectural aspects as the essential, even defining, element of a BM include, for example, Doz and Kosonen (2010) who depict business models “as sets of structured and operational relationships” between a firm and its internal and external stakeholders, hereby highlighting what Baden-Fuller and Haefliger (2013) refer to as a business model “containing cause and effect relationships” (see also Zott and Amit, 2010; Bock et al., 2012; Khanagha et al., 2014; and Santos et al., 2009).

Building on definitions of BM that stress the architecture of activities, Foss and Stieglitz (2015) and Foss and Saebi (2017) define BMI as “designed, novel, and non-trivial changes to the key elements of a firm's business model and/or the architecture linking these elements.” The requirement that BMI be designed is imposed because BMI requires top-management action. The requirement of non-triviality is imposed so as to not include minor changes in, for example, supplier relations or product portfolio. Novelty is imposed to capture the innovation dimension.

Although we suggest that there is an increasing number of studies that proffer definitions of BM and BMI that stress the systemic/architectural aspects of sets of connected activities underlying value creation, delivery and appropriation (and changes in such), we do not here offer bibliometric evidence for this view. Rather, we argue that such definitions are *unifying* rather than merely inclusive (as in wide enough to include very different existing definitions). Specifically, they highlight what we consider the *essence* of BM and BMI, and thus unites existing definitions that implicitly or explicitly consider the architecture of activities (and changes thereof) to be the key aspect of BM (and BMI), but exclude those that do not. We would also stress the potentially *generative* nature of these definitions, that is, definitions that are precise, unifying (without being overly inclusive), and link up with existing relevant thinking in, for example, complex systems theory and the theory of complementarity (cf. Foss and Saebi, 2017), assists cumulative theoretical development (and subsequent empirical progress) by virtue of these characteristics.

We have already suggested that architecture-oriented definitions are unifying because they capture the emphasis in most existing definitions of BM and BMI on value proposition, customer segments, value chain organization, revenue mechanisms, etc. (and changes in these), but then add that the key aspect of BM and BMI is that the activities underlying these elements are linked together in an architecture. By the latter we mean that they are particularly useful in explanatory tasks involving BM or BMI because they capture the essence of the phenomenon *and* allow for clear explanations/predictions based on linking the unit to outcomes (if BM, BMI are taken to be dependent variables) or to antecedent (if the unit is instead to be what should be explained).³

² An architecture may generally be defined as 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 et al., 2001: 108).

³ Zott and Amit (2010) introduce “novelty” as a dimension of BM. However, this essentially means that BMI becomes identical to “BM with a high degree of novelty.” We think this potentially obscures the independent challenges of theorizing BMI.

Dimensionalizing the key constructs

Units of analysis can be powerful in the above sense when they are dimensionalized in ways that are particularly helpful for explanation. To revert to the TCE example that we introduced at the beginning of this article, the key push forward in the evolution of TCE was the inclusion of asset specificity as one of the three dimensions of transactions (Williamson, 1985). Thus, this dimension in particular decisively made the theory capable of putting forward predictions regarding the organization of transactions across markets, hybrids and hierarchies.

Dimensionalizing the BM construct

As laid out in Table 1, definitions of BM and their underlying components vary considerably. As a result, no established typology of BM exists. Nevertheless, we think that the BM and BMI literatures may be (implicitly) converging with respect to dimensionalization. As suggested already, in theory-building dimensionalizing a construct should reflect the explanatory purposes to which the construct is put to use. Most such explanatory purposes seem to reflect the key issues of strategy, that is, how is value created (and delivered) and captured on a higher level than the competition is capable of, perhaps on a sustained basis (e.g., Peteraf and Barney, 2003). There are exceptions to this; for example, in some papers, BMs serve the purpose of supporting a firm's pursuit of sustainability objectives, where managers strive to balance societal and environmental values with financial profitability (e.g., triple bottom approach). These studies illustrate how BMs can be purposefully designed to create social value in the context of low income markets (Anderson and Kupp, 2008; Sánchez and Ricart, 2010; Yunus et al., 2010) or lessen negative externalities on the environment (Bocken, 2015). However, a very significant fraction of BM papers essentially adopt a variation of the above perennial strategy questions (Massa et al., 2016). The Teece (2010) definition which we cited above of course also reflects this.

Strategy has several established ways of addressing the issues of value creation and capture, competitive advantage and sustained competitive advantage, such as the RBV VRIN or VRIO frameworks (Barney, 1991, 1995). The field also offers rigorous definitions of these concepts (e.g., Peteraf and Barney, 2003). At the same time, various contributions suggest that resource attributes such as complexity and path-dependence are important dimensions of the analysis of sustained competitive advantage (Barney, 1991). These dimensions link directly to BM. If the key aspect of a business model is "architecture," that is, how the activities underlying the firm's value creation, delivery and capture mechanisms are linked, then the complexity of this architecture is a natural dimension of a BM. Indeed, established thinking in strategy directly links the complexity of the company's overall activity profile directly to sustained competitive advantage (Rivkin, 2000; Porter and Rivkin, 2012). Relatedly, while complexity and complementarities, which we highlighted as integral to what we mean by architecture, are not identical, they are clearly related. Complementarities are not only value drivers, but may also be highly complex. Additionally, complementarities help explain uniqueness, as well as rigidity (or, lock-in because of path-dependence). The reason is that systems with complementarities are also systems with multiple equilibria (Brynjolfsson and Milgrom, 2012). Thus, a firm may choose one particular equilibrium while rivals choose another one. Because systems with complementarities are difficult to change (because they may involve complex relations and are therefore difficult to imitate, and/or because they require strong concerted management action), performance differences may persist. For these reasons, complementarity would seem to be a, and arguably *the*, key dimension of business models (cf. also Zott and Amit, 2010; Foss and Stieglitz, 2015).⁴

However, complementarity itself needs to be unpacked to understand how BMs may vary in terms of the complementarities they involve. As Foss and Stieglitz (2015) argue complementarity is a managerial choice variable. Managers can choose different kinds of complementarities and they can choose complementarities of varying strength. For example, the way a firm structures its value chain reflects choosing complementarities of different strength. Some companies prefer many suppliers and arms-length relations, while others prefer to cooperate intensively with a few select suppliers. The latter may enable kinds of complementarities to be built that cannot be built under arms-length. For example, key suppliers may assume some development or design initiative, thus directly influencing the value proposition of the firm. Similarly, increasingly companies let customers participate in value creation (e.g., Build-a-Bear or Lego). Additionally, platforms increasingly allow consumers to create content (YouTube), buy and sell items (eBay), rent out underutilized capacities (Airbnb) or swap out designer clothes (Swapdom), while the platform company generates revenue from third-party advertisers (Facebook), subscription fees (Netflix) or through data licensing (Twitter). Again, complementarities may differ. Thus, while Lego has chosen to have intense relations to its "Lego Certified User", the relations to the "ordinary" user interacting through one of the many Lego user groups are much weaker. In other words, the firm's choice of the kind and intensity of the complementarities is reflected in the choice of the value chain configuration in its business model.

To be sure, the BM literature offers many alternative implicit or explicit attempts to dimensionalize BMs. For example, some suggest that BMs primarily differ in terms of "what rights are being sold" and "what type of asset are involved," (Weill et al., 2005). However, this seems to put the emphasis on either the product side or the resource side and does not point to the

⁴ Broadly, complementarity obtains in connection with decisions involving fixing the levels of a set of variables (say, x and y): Complementarity obtains when choosing a higher level of x raises the returns of choosing a higher level of y and *vice versa* (more precise definitions, based on lattice algebra, may be found in Brynjolfsson and Milgrom, 2012).

architecture or system dimension which is key to the nature of a BM. Others again characterize business models in terms of patterns such as long tail, multi-sided, and freemium business models (Osterwalder and Pigneur, 2010). This is also partial, but points in the right direction. For example, a “long tail business model” means focusing on a large number of products with low volume (rather than few high volume products). This choice has indeed important implications for the elements of a business model (e.g., in terms of the “canvas”, it matters to each single cell; Osterwalder and Pigneur, 2010) and how these elements are connected. Thus, while the architecture aspect is not highlighted, it is still present.

Similarly, a number of attempts to dimensionalize BMs point to ownership of assets. For example, a standard example in the literature is Xerox leasing out its copying machines rather than selling them (with an extra fee on each copy above a certain threshold), starting with the Model 914 in 1959, because buyers expected (erroneously, it turned out) a low daily amount of copies and therefore were not willing to huge costs, not only of buying the machines themselves but also of servicing them. Thus, while perceived risk as well as speculation (Xerox ran a huge risk) may have played roles, again complementarity (namely, between the assets and their servicing) played a role in Xerox’ decision to own rather than sell machines. Other examples about ownership being a key dimension of BMs usually also involve complementarities. The reason is not difficult to discern: A key antecedent of ownership patterns in the economy is indeed the structure of complementarities between assets (Hart, 1995; Williamson, 1996); for example, assets that are highly complementary (and co-specialized) will tend to be under joint ownership (idem.).

In sum, the above has been a sustained plea for considering complementarity *the* key dimension of BMs. As a theoretical concept, complementarity captures the key architectural dimension of BMs. Moreover, a number of other suggested dimensions of BM one way or the other reduce to complementarity.

Dimensionalizing the BMI construct

BMs are often dimensionalized in terms of *novelty* (cf. Johnson et al., 2008; Osterwalder et al., 2005; Santos et al., 2009; Bock et al., 2012; Foss and Stieglitz, 2015) and *scope*. With respect to the latter, some scholars suggest “that BMI can be manifest in a change in a single component of the firm’s BM (e.g., Amit and Zott, 2012; Bock et al., 2012; Santos et al., 2009; Schneider and Spieth, 2013), while others suggest that “two or more” components of the BM must change before we can meaningfully talk about a BMI occurring (e.g., Lindgart et al., 2009). Still others require an entirely novel combination of all BM components and the architecture linking them (e.g., Velamuri et al., 2013; Yunus et al., 2010)” (Foss and Saebi, 2017: 12). Even though there is disagreement on “how much has to change”, there is still agreement that scope is a relevant dimension. Notice that scope involves complementarities. Thus, if one part of a BM can be innovated in a “modular” fashion, it is exactly because the complementarities to other parts are not that strong (of course, there may be strong complementarities within each individual “module”).

These dimensions are useful in developing typologies that help to organize different kinds of observed BM and BMI. Thus, relying on *scope* (modular vs. architectural) and *novelty* (new to the firm vs. new to industry), Foss and Saebi (2017) construct a typology of four types of BMI (see Fig. 1).

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

Fig. 1. BMI typology.

Source: Foss and Saebi (2017:217).

While evolutionary BMI refers to naturally occurring changes that happen to individual components of the BM over time, adaptive BMI “involves changes in the overall business model that are new to the firm, but necessarily not new to the industry. These are cases where the firm adapts the architecture of its BM in response to changes in the external environment, such as in face of competition from a new business model in their industry” (Foss and Saebi, 2017: 217). For example, a significant segment of the pharmaceutical industry is heading towards more service-based business models (e.g., offering online advice to clients), a change that is accompanied by changing relations to suppliers and customers (pharmacies, doctors, hospitals) as well as changing internal relations (e.g., defining new KPIs for sales people, establishing stronger linkages between sales and marketing and R&D) (Rasmussen and Foss, 2015). While these changes are new to the firm, they are carried out as a *response* to a changing industry structure. “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 business model, such as targeting a new market segment that has been ignored by its competition” (Foss and Saebi, 2017: 217). For example, evading competition from Microsoft’s Xbox and Sony’s Playstation (where competition converged on basis of better graphics and processor speed), Nintendo launched its Wii to non-gamers. Hereby, Nintendo successfully created a new market (e.g. blue ocean strategy), while keeping its core capabilities intact. Often led by newcomers, complex BMs affect the business model in its entirety and have the potential to disrupt established industries (e.g., Airbnb in the accommodation industry, Uber in transportation).

Building from established theory

Construct clarity and clarity regarding how the basic units of analysis are dimensionalized, as well as agreement on defining and dimensionalizing the units of analysis, are desirable in their own right. These features mean that we are confident that we agree on the nature of the core phenomena and we agree that the key ways in which these phenomena differ have been captured. However, an additional bonus often is that it becomes clear what theories that be most usefully utilized to further the field.

To illustrate, the definitions and dimensionalizations proffered here point to complementarity as a key aspect of BM and BMI. The notion of complementarity, which is intimately related to traditional notions in management research of interdependence, synergy, systeminess and much else, is surrounded by much theorizing as well as empirical work (see the overview in [Brynjolfsson and Milgrom, 2012](#)) that BM and BMI research can tap into. Additionally, the emphasis on complementarity links to the “complex systems” systems ([Simon, 1962, 1973](#)), potentially allowing BM and BMI research to tap into related literatures on the NK model ([Fleming, 2001](#); [Levinthal, 1997](#)) as well as the innovation literature on modular versus architectural innovation ([Henderson and Clark, 1990](#)). Additionally, the dimension of novelty which we argued is an indispensable dimension of BMI also links to the innovation literature. Thus, starting from an “architectural” definition of BM and BMI leads, via the dimensions of complementarity and novelty, to a few core literatures that speak in a rigorous manner to the BM and BMI phenomena and offer a wealth of insights that can further research.

However, obviously typologies and theory shouldn't be developed for their sake, but because they exist in the fundamental activities of explanation and prediction. We next turn to discussing the roles of the BM and BMI constructs in a larger explanatory context, that is, the problems that BM and BMI are supposed to help us solve.

What are the problems?

BM and BMI problems

Fields differ depending on the problems they try to solve, that is, the questions they ask, and/or how they solve those problems. As indicated by [Massa et al. \(2016\)](#) BM and BMI research has been contested because to some scholars it has not been obvious that it was asking new questions and/using novel insights to address and solve those questions. This sentiment is understandable. Consider, for example, the following quotation from three extremely influential strategy scholars ([Rumelt et al., 1991](#): 5):

... firms have choices to make if they are to survive. Those that are strategic include: the selection of goals; the choice of products and services to offer; the design and configuration of ... competitive strategy; the choice of an appropriate level of scope and diversity; and the design of organization structure, administrative systems and policies used to define and coordinate work ... It is the integration (or reinforcing pattern) among these choices that makes a set a strategy.

It would seem that the “integration (or reinforcing pattern) among these choices” gets quite close to what we mean by a BM, and the notion that successful “integration” matters to performance can be seen as taking the BM as an independent variable in the explanation of performance. As such, the BM construct is indeed core in strategy, because it points to the interconnectedness of those choices that matter (the most) to the performance of the firm.

And yet, although the field has been aware of the interconnectedness of such choices for a long time (see also, e.g., [Porter, 1996](#)), there is surprisingly little research in established strategy research that takes such an overarching perspective. Strategy research has been compartmentalized into subfields (competitive strategy research, TMT research, strategic human capital etc.). Part of the explanation of the success of the notions of BM and BMI constructs may thus be that they filled a need for more “holistic” views of the firm. Thus, an early use of the BM construct was as classification device to understand value drivers of (e-commerce) business models (cf. [Amit and Zott, 2001](#); [Rappa, 2001](#); [Magretta, 2002](#)). Since then, we witnessed an increased trend towards digitalization, cloud computing and big data accompanied by the rise of the sharing economy and increased servitization, which has brought forward new forms of businesses and value innovations that have sometimes been argued to defy traditional theories. Perhaps in the final analysis they really don't, but the point is that these changes affect a number of interconnected parts of firms, that is, their business model, and established perspectives may, because of their often highly partial views, not have been immediately ready to assume the broader, more holistic perspectives that are necessary to grasp major architectural changes. In the following we briefly discuss various explanatory tasks that involve such “broader, more holistic perspectives” so as to indicate how adopting the conceptualizations proffered in this paper can contribute to tackling these tasks in an effective way. To organize the discussion we make use of terminology from the established variable-centered variance approach (which, of course, does not imply that we wish to disregard small-N research on BM and BMI).

BM and BMI as independent variables

That BM and BMI may be independent sources of value creation and competitive advantage are important themes in the literature (e.g., [Casadesus-Masanell and Ricart, 2010](#); [Markides, 2006](#); [Chesbrough, 2010](#)). As a starting point, a straightforward resource-based analysis may be applied to BMs and BMIs ([Barney, 1991](#)), which will likely point to complementarities as both value drivers and the reasons why the competition may have difficulties imitating the successful BM or BMI (e.g.,

McGrath, 2010). Although there are no established scales for measuring BM and BMI yet (cf. Clauss, 2016; Saebi et al., 2016), this way of approaching the issue of why BM and BMI may cause success is empirically researchable in principle.

However, BM and BMI are not “ordinary” resources and may pose particular challenges for the analysis of firm success. Thus, in designing a BM (or innovating an existing one), management confronts a basic trade-off between designing, on the one hand, a BM that is tightly knit, based on strong complementarities, yielding a high level of value creation and being difficult to imitate, and one that is much more modular, and easier to imitate, but also considerably more flexible (Fleming, 2001). In other words, the value of a BM/BMI is context-dependent, and will change as the environment changes. While the point that resource-value is context-dependent is recognized in strategy thinking, it is perhaps particularly emphasized if the relevant “resource” is a BM.

Additionally, the BM and BMI constructs help us cope with a puzzling phenomenon, namely that firms that do not seem to have significant resources and operate under unfavourable industry conditions (e.g., low entry barriers) may still survive and even prosper. Traditional strategy thinking, rooted in the positioning view or the resource-based view of the firm (Barney, 1991) would not expect such firms to thrive for long. Yet, companies such as Airbnb and Uber thrive in spite of seemingly not owning significant assets. A BM perspective suggests that these companies are successful because of a BM that it is (1) based on a critical mass of providers and users that (2) are connected in an intricate system of complementary activities in the creation, delivery and capture of value.

Empirically, as Foss and Saebi (2017) illustrate in their review of the BMI literature, only a handful of studies have succeeded in linking BMI with increased competitiveness, innovativeness or other measures of firm performance (and then mainly in a correlational way). This lack of empirical research is attributed to the complexity of operationalizing and measuring the BMI construct, as well as the time lag between BMI and (potential) performance outcomes. Thus, as operationalization of the BMI construct (and performance indicators) differ significantly across studies, meaningful comparisons of results are not warranted. Given the lack of empirical evidence, it is not clear whether a change in business model might be beneficial to the firm at all, and whether different types of BMI can result in different outcomes.

These problems ultimately hark back to the absence of clear definitions and dimensionalizations of BM and BMI. Because the definitions and dimensionalizations we have proffered in this essay capture the essence of BM and BMI, we are confident that they will enable more decisive empirical evidence to be amassed, furthering cumulative empirical evidence about the performance effects of BM and BMI.

BM and BMI as dependent variables

Compared to the well-established literatures on product, process and service innovation, relatively little is known empirically about where BMs come from, that is, the origination, innovation, dissemination, adoption, etc. of BMs.⁵ The reason for the lack of theorizing on the *dynamics* of BMs can be found in the predominantly *static* view adopted towards BMs in the literature (cf. Demil and Lecocq, 2010). As a result, research on how BMs come into being (by entrepreneurial judgment and enactment; for a discussion on this see Foss et al., 2016) and the antecedents that trigger changes in the architecture between (complementary) BM elements that produce alterations to the BM are only emerging (for discussion on this see Saebi et al., 2016).

For example, the link between environmental conditions and organizational response has been studied in a number of streams in the strategic and organizational literatures (e.g. Burns and Stalker, 1961; Perrow, 1967; Hannan and Freeman, 1977; Chakravarthy, 1982; Teece et al., 1997), arguing that firms have to make appropriate decisions with regard to both internal arrangement and external alignment. In line with this thinking, recent research points to the role of external stakeholders (Ferreira et al., 2013), changes in the competitive environment (De Reuver et al., 2009) new information and communication technologies (ICT) (Pateli and Giaglis, 2005; Sabatier et al., 2012; Wirtz et al., 2010) and dynamic capabilities (Achtenhagen et al., 2013) in bringing about change in BMs. However, different external antecedents are likely to cause different changes in the BM, some of which can be pro-active or reactive in face of external change, with different market (competitive) outcomes (for a discussion on this see Saebi, 2015).

Another crucial question is the effect of top management action (leadership) on BM design (choice of complementarities) and BM transformation (alterations to the architecture of the BM). Different BMs pose different management challenges and thus require different leadership interventions. For example, while in evolutionary BMI (which is modular and new to the firm) top management acts a central monitor, ensuring that employees do not overstep their mandates and that changes to the business model do not violate the core logic of the firm, in complex BMI top management becomes the architect who is actively involved in everyday experimentation and decision making (Foss and Stieglitz, 2015). In short, such reasoning suggests that top management has a crucial role in contributing to the success of BMI, given that its involvement matches the type of BMI chosen.

BM and BMI as mediator and moderator variables

Some of the first uses of the BM construct stressed its role as moderator and mediator variables. Thus, the influential Chesbrough and Rosenbloom (2002) study suggested that a new idea or technology may have little inherent value unless it is

⁵ For example, a search in EBSCO database reveals more articles are published on the topic of product innovation (2206 hits), followed by process innovation (835 hits), service innovation (679 hits) and lastly business model innovation (260 hits). The search was conducted in the title, abstract and keywords of peer-reviewed articles, December, 2016.

commercialized by a BM, and that, more generally, technology and economic value needs to be mediated by BMs. Thus, the choice of business model allows managers to capture the latent value of the technology and commercialize it by choosing the right mixes of value proposition, market segment, cost structure, revenue model, and value network (Chesbrough and Rosenbloom, 2002), an early illustration of the importance of complementarities in thinking about the nature of BMs.

In addition, research points towards the important roles of BM and BMI in underpinning a firm's strategic mission. For example, companies increasingly engage in open innovation (OI) practices (e.g. crowdsourcing) to foster new product/service development (or other performance outcomes). Curiously, while a majority of the OI literature is concerned with what makes these collaborations successful, only a handful of studies discuss the business models that need to support these OI practices (but see Saebi and Foss, 2015; Aranha et al., 2015; Paulose and Nair, 2015). Here, the BM becomes a moderating variable between the firm's pursuit of OI practices (which might differ in depth and breadth of collaboration with external knowledge sources, see Laursen and Salter, 2006) and the desired outcome, such as increased innovativeness. In fact, failing to align the BM to the firm's new OI practices might explain why many firms fall short in attained the desired results (Saebi and Foss, 2015).

A similar phenomenon can be observed in the literature on sustainability/corporate social responsibility (CSR), where managers strive to balance societal and/or environmental values with financial profitability (e.g. triple bottom approach, base of the pyramid). Noteworthy, while the literature on sustainable business practices has expanded considerably over the last decade (for an excellent review of CSR literature see Aguinis and Glavas, 2012), research that examines how these values manifest in the firm's value creation, delivery and capture mechanisms (i.e. the design of the BM) is to a large extent missing. Thus, these attempts often appear as mere "window-dressing" when values, such as fair trade or reduced carbon footprints, are not implemented consistently throughout the business model.

Table 2 summarizes the key questions/theories that future research can address in order to contribute to the theoretical as well as empirical advancement of the BM and BMI discipline.

Table 2
Future research directions.

Problem	Potential research questions	Useful theories/research streams
1. BM and BMI as independent variable	<ul style="list-style-type: none"> • How do interdependencies within the BM look like and what does this imply for the transformation/innovation process? • Are some types of BM and BMI more profitable than others? 	<ul style="list-style-type: none"> • Complexity theory (Simon, 1962; Levinthal, 1997) • Complementarity theory (Ennen and Richter, 2010) • Innovation theory (e.g., Henderson and Clark, 1990)
2. BM and BMI as dependent variables	<ul style="list-style-type: none"> • What is the role of dynamic capabilities as internal drivers of BMI? • What are the external drivers of BMI? • What is the role of entrepreneurial "vision", "imagination" and "judgment" in the design of BM and BMI? • What is the role of employee resistance in BMI and how can it be overcome? • Role of managerial cognition/characteristic of top management team in BMI? 	<ul style="list-style-type: none"> • Dynamic capabilities theory (Teece et al., 1997) • Entrepreneurship theories (Knight, 1921; Foss and Klein, 2012) • Leadership theories (Howell and Avolio, 1993) • Contingency theory (for a review see Boyd et al., 2012)
3. BM and BMI as moderating/mediating variables	<ul style="list-style-type: none"> • How does a change in the firm's BM affect the BMs within its ecosystem/network relationships/stakeholders? • What types of BMs are conducive in implementing open innovation? • How can BM be innovated towards greater sustainability (with regard to environmental and societal concerns)? • How does a shift toward servitization affect the firm's existing business model and its underlying org. design? 	<ul style="list-style-type: none"> • Open system perspective (Berglund and Sandstrom, 2013) • Open innovation and collaboration (Chesbrough, 2006) • Sustainability/CSR (for review see Aguinis and Glavas, 2012) • Servitization (e.g., Nair et al., 2013)

Conclusions

Notions of BM and BMI have had something of a bad reputation in management research, and their popularity among practitioners is in no way mirrored in terms of presence in top management research journals, although some journals, notably *Long Range Planning*, have contributed to the credibility of these constructs and their associated theorizing. Scholars have typically considered writings on BM and BMI to be either little more than relabelling exercises or simply too unclear and ill-structured to take seriously. We disagree with both views, but think that considerably more needs to be done in terms of establishing and consolidating the theoretical structure underlying BM and BMI research.

First, BM and BMI research is not a mere relabelling exercise. In a sense, such research represents a rediscovery of a classic theme in macro management research, namely that of firms as systems of more or less interdependent activities that are shaped by and (in the aggregate) shape a macro environment (e.g., Lawrence and Lorsch, 1967). It is arguable that this view has been lost in much strategy thinking which has taken considerably more partial views, both of firms and of the sources of firm success. In contrast, BM and BMI research suggests that firm success may turn on the systemic properties of the firm's BM. Additionally, BM and BMI research link the systemic view to strategic firm actions concerning, for example, sustainability

(e.g., Boons et al., 2013) and innovation (e.g., Aspara et al., 2010). It also links the analysis of the BM to issues concerning the boundaries of the firm (Gambardella and McGahan, 2010).

Second, BM and BMI research does not present “wicked”, intractable problems. The constructs can be defined, dimensionalized, linked to existing theorizing, placed in a reasonably articulated theoretical structure, and turned to well-defined explanatory and predictive tasks. Before this can be done, however, more consensus on definitional and dimensionalization issues is probably required. However, there are signs that the field may be moving towards a definition and dimensionalization that is fundamentally rooted in a view of BMs as architectures. In turn, definition and dimensionalization open the door for operationalization and measurement and therefore for the testing of empirical hypotheses.

As we have argued, thinking about BM and BMI as architectures opens for the application of established theory that in turn open up several vistas for new research. Thus, we have mentioned, for example, the different leadership requirements that different kinds of BMI call for. Because changing the BM is a central top-management task, there is a potentially very fruitful link to TMT theory. For example, are more diverse TMTs better at searching for new BMs? Are less diverse TMTs conversely better at implementing new BMs? How do TMT characteristics influence the characteristics of the BM that is implemented? We have also mentioned how thinking based on NK theory suggests that the search for and implementation of BMs depends on the nature of the landscape over which the search takes place. Additionally, thinking of firms in terms of the BM they come equipped with potentially casts a new light over many strategic decisions. Some strategies will and other will not be pursued because they are not consistent with the firm’s BM. Some boundary decisions will appear more attractive than other decisions because they represent a better fit with the BM. In contrast, most of the established thinking on firm boundaries take a partial, micro view that starts from the individual transaction (Williamson, 1985). However, transactions are embedded in larger contexts, notably the BM of the company, which may influence the assessment of the costs and benefits of particular transactions and therefore their organization.

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