

The Dynamics of Business Model Innovation for Technology Entrepreneurship: A Systematic Review and Future Avenue

SAGE Open
July-September 2021: 1–12
© The Author(s) 2021
DOI: 10.1177/21582440211029917
journals.sagepub.com/home/sgo
 SAGE

Run Wang¹ and Abdella Kosa Chebo²

Abstract

Technology entrepreneurship involves creating sustainable value through capitalization and commercialization of innovative new technology, accelerates the growth of firms, and helps in promoting the sustainability of the economy. However, the literature on the business model innovation (BMI) for technology entrepreneurship has no clarity yet. Therefore, this article aims to build a business model innovation for technology entrepreneurship (BMIfTE) toward economic sustainability. To meet this aim, various publications on the subject matter have been reviewed and synthesized and I compared the logic and arguments of various scholars to draw conclusions and develop BMIfTE. The article structures the BMI for technology entrepreneurship as obtained through experimentation, generating, renewing, designing, changing, and implementation, backed by inputs such as value migration, opportunity and risk assessment, dynamic capability, stakeholders networking, firms' strategies, and institutional ontology that contribute to sustainable economic development. In this sense, the BMI improves the current delivery system by creating a new offering system, which leads to a reconfiguration of the model by integrating with the technological ecosystem's capabilities in creating and exploiting new business opportunities.

Keywords

business model, technology entrepreneurship, innovation

Introduction

The new economic context of globalization, knowledge, innovation, and technological entrepreneurship contributes to the rise of the novel entrepreneurial ecosystem (Roja & Năstase, 2014). These developments play a role in changing the sense of balance between various stakeholders (Teece, 2010) by allowing firms to involve differently in economic exchange (Mendelson, 2010; Zott & Amit, 2007). Previously, firms innovate products, processes, and technology in creating and achieving sustainable values (Hansen et al., 2009). However, the route toward sustainability requires a change in the purpose and strategies of business (Bocken et al., 2014). These methods were not adequate and need to be complemented with business model innovation (BMI) to bring more sustainable value to the organizations (Hansen et al., 2009; Schaltegger et al., 2012). This is because no equivalent ontology is available to describe the strong sustainable business model (Upward & Jones, 2016). Therefore, firms should find novelty in performing activities that help to achieve the novel business model advancement (Ireland et al., 2001).

Business models expose the way enterprises are linked to various stakeholders and are involved in economic exchange with these stakeholders in creating value for the partners

(Zott & Amit, 2007), as well as contribute to the successful commercialization of disruptive technologies (DaSilva et al., 2013). The value of technology alone will be less as values are emerged through commercializing using a business model (Chesbrough & Rosenbloom, 2002; DaSilva et al., 2013). That is, technological innovation requires business models in creating and bringing innovations to the market and creating an opportunity that satisfies the unsatisfied customer's need (Teece, 2010). Accordingly, looking for integrations among the economy and technology arises to be important to identify the most appropriate strategies (Roja & Năstase, 2014). Moreover, the intention should be tended to gain technological capability and personnel skills in developing innovation and being competitive (Khefacha & Belkacem, 2016). Therefore, it is crucial to look at the existing challenges and business model cases in improving

¹School of Economics and Management, Shihezi University, Xinjiang, China

²Faculty of Business and Economics, Kotebe Metropolitan University Addis Ababa, Ethiopia

Corresponding Author:

Abdella Kosa Chebo, Faculty of Business and Economics, Kotebe Metropolitan University, Addis Ababa, Ethiopia.
Email: abdikosa@gmail.com



Creative Commons CC BY: This article is distributed under the terms of the Creative Commons Attribution 4.0 License (<https://creativecommons.org/licenses/by/4.0/>) which permits any use, reproduction and distribution of

the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (<https://us.sagepub.com/en-us/nam/open-access-at-sage>).

performance (Kim & Min, 2015; Sabatier et al., 2010; Santos et al., 2015; Snihur & Tarzijan, 2018).

Theoretically, problems with business model research continue to hinder theory development (Fjeldstad & Snow, 2018); still, the concept is ill-defined (Roome & Louche, 2016) and there is no clarity in purposes and concepts (Cosenz & Noto, 2018). In addition, the study lacked academically enquiring about the complexity of a multi-business model setting (Nickerson & Zenger, 2004; Snihur & Tarzijan, 2018). Practically, it is still a serious challenge in developing a feasible business model (DaSilva et al., 2013). Among these challenges, the most important is designing a business that creates economic achievement (Abdelkafi & Täuscher, 2016; Schaltegger et al., 2012). However, innovating a novel business model will not always be the root to success (Teece, 2016) because of the complexity associated with the new business environment. Therefore, managers should creatively handle the interaction between business models and innovativeness (Baden-Fuller & Mangematin, 2013). Generally, a BMI leads to the higher complexity of how the business model is understood and improved to make the business successful.

By reviewing the various papers collected, logic and arguments of various scholars were compared and conclusions were drawn based on the synthesized arguments. As we understand from the existing literature, some scholars focus on the science-based factors' impact on the BMI, while others elucidate the institutional factors' impact on the BMI. Moreover, various authors studied BMI and technology entrepreneurship separately. To fill this gap, this study conceptualizes BMI for technology entrepreneurship as a single concept. To summarize, this study first links BMI to technology entrepreneurship and tries to evaluate and build an all-inclusive BMI for technology entrepreneurship. That is, the impetus of this study is to redesign the new business model that senses the wider importance of BMI in technology entrepreneurship toward the successfulness of ventures. Second, it links this innovative business model to the firm's performance and economic sustainability. In this sense, the study uncovers a specific relationship of the business model innovation for technology entrepreneurship (BMIfTE) to specific a variable of economic sustainability. Therefore, the article tends to address the following questions:

1. How the construct BMIfTE is conceptualized?
2. What are the components of a comprehensive BMIfTE?
3. Is BMIfTE contributed to economic sustainability?

Theoretical Foundations

Conceptual Linkage Between BMI and Technology Entrepreneurship

Arguments about technology entrepreneurship are lying around establishing and developing firms (Bailetti, 2012),

and facilitating novel business models (Baden-Fuller & Mangematin, 2013). The necessary evidence, facts, and knowledge should be collected using technology in answering significant issues of the business model, new undertaking, and markets (Roja & Năstase, 2014). However, the value of technology alone will be less as values are emerged through commercializing using a business model (Chesbrough & Rosenbloom, 2002). Commercialized technology provides a variety of results and firms are requiring better values from launching a new and innovative business model and technology (Chesbrough, 2010). Besides, technology innovation requires a business model in bringing innovations to the market and satisfying unsatisfied customer needs (Teece, 2010). In this sense, a business model is an integration of elements and activities that are performed to satisfy the unrequited market needs (Cosenz & Noto, 2018). Combining the two, opportunities can be thought of as technically visible latent demand (Eckhardt, 2013). Therefore, a feasible business model helps in successfully commercializing the disruptive technologies (DaSilva et al., 2013) and is integrated into the technology innovation (Baden-Fuller & Haefliger, 2013) particularly and technology entrepreneurship in general.

Elements of BMI for Technology Entrepreneurship

For technology entrepreneurship, the four core characteristics of business models that emerge from the literature, such as value proposition, value network, value capture, and value creation and delivery (Roome & Louche, 2016), need a considerable improvement to commercialize technological innovation. Attention also needs to be paid to the concepts of configuring, creating, and capturing the value and designing (Amit & Zott, 2001; Baden-Fuller & Mangematin, 2013; Teece, 2010), and interaction with technology (Baden-Fuller & Haefliger, 2013; Chesbrough & Rosenbloom, 2002; Roome & Louche, 2016). Recently, Foss and Saebi (2017) state that the alignment of a proposed value, segmented targets, revenue mechanisms, value chains, and the internal structures is necessary. Hence, BMI establishes innovative modifications of such complementary relationships that are imposed to capture the innovation (Cosenz & Noto, 2018). Therefore, the business model needs modification and improvement with technology advancement.

Technology entrepreneurship encompasses the practices of identifying and capitalizing human resources and commercial opportunities related to technology (Dorf & Byers, 2005). Accordingly, the entrepreneurial resources, including financial resources and human resources, help entrepreneurs engage in the discovery, evaluation, and exploitation of opportunities (Kosa & Mohammad, 2017). These resources are critical in improving the existing business models or introducing new ones (Fjeldstad & Snow, 2018) or in modifying at least one of the stated elements (Abdelkafi et al., 2013). Similarly, taking out the BMI helps to clarify the main strategies of the business model (Hacklin, 2018). As the

business model is more about how is it being done (Santos et al., 2015), it depends more on the strategies employed than its components. The operational aspects of business model indicate the way firms are doing their business (Fjeldstad & Snow, 2018) and investigate the factors that affect firm performance (Chebo et al., 2018).

Developments on business model focus on the dynamic outlook speaks about the innovativeness in the business model (Bjorkdahl & Holmen, 2013; Chesbrough, 2010; Massa et al., 2017; Zott et al., 2011). Therefore, a classic BMI represents discrepancies around a configuration of values (Fjeldstad & Snow, 2018). Although innovating at least one element in BMI is necessary, the successively changing business models core logic is the sufficient condition (Futterer, 2014; Futterer et al., 2018; Spieth & Schneider, 2016). Based on these logics, creating or modifying the existing business model through changing at least one element can be considered as a BMI (Futterer, 2014; Futterer et al., 2018; Spieth & Schneider, 2016). Furthermore, the argument that BMI is key to firm performance has gained momentum (Futterer et al., 2018) and focused as spring for competitiveness and performance (Kim & Min, 2015; Visnjic et al., 2016). The innovativeness identifies and exploits business opportunities through engagement in new ideas, products, processes, and markets; as a result, the overall performance of ventures will be improved (Chebo & Kute, 2018).

Method

Search Strategy

This systematic review was conducted to analyze the existing literature on BMI and link it with technology entrepreneurship by synthesizing their determinants and outcomes toward economic sustainability. Before the study was started, the presence of an existing systematic review on the construct of BMiFTE as a single concept was checked to avoid duplication. To establish the BMI for technology entrepreneurship as a new single construct, the literature was identified primarily from Google Scholar (GS). As the concept is multidisciplinary and many unrelated publications were identified, a comprehensive traditional literature review was established to establish the parameters for a consequent systematic review (Jesson, 2011). Together, they enable the origination of the framework (Upward & Jones, 2016). Moreover, to retrieve additional articles, the traditional literature reviews were conducted with key references from the identified papers. To meet this, the following search terms were used: Business model innovation, technology entrepreneurship, and economic sustainability. The search terms were predefined to allow an all-inclusive search strategy that included all important articles.

Study Selection and Eligibility Criteria

The major sources of citation data were Web of Science (WoS), GS, and Scopus. The coverage of WoS and Scopus

was different among different disciplines. For instance, their coverage is not good in social sciences and humanities (Mahdi et al., 2008). Comparatively, GS is advantageous by searching all citations from several sources. The coverage of research output is higher in GS and also does not differ among subject matters (Amara & Landry, 2012).

In general, although the data quality and reliability were poor in GS, WoS and Scopus were weak in nonscience subjects. This makes GS comparatively advantageous over these subject matters. Currently, many indicators were established to measure the quality of journals. Some of them are *h*-index and SJR (SCImago Journal Rank). For this specific research, after data were obtained from GS, the selected articles' quality was checked using the journal impact factor (JIF) for journals published in Thompson Reuter's WoS, and SJR of Scopus. JIF is important in using GS as it ignores the lower down papers. Similarly, SJR is important, its value is normalized, and its current version in Scopus has a refinement that considers the relatedness of the citing journal (Guerrero-Bote & Moya-Anegón, 2012).

In collecting data, several procedures were followed: First, I checked for suitability of peer-reviewed scholarly works by identifying works related to BMI, technology entrepreneurship, and economic sustainability. This formulates a comprehensive BMI that works for technology entrepreneurship and also has a contribution to the firm's performance and economic development. In this sense, the framework has the inputs for BMiFTE and its processes that may bring better outcomes (individual firm's performance and sustainable economic development).

It was targeted in collecting data from articles published on the subject matter. Accordingly, GS was used as a primary database in accessing peer-reviewed reputable journals to obtain a wide coverage of literature on the subject matter. In addition, the special issues of long-range planning and organization and environment journals were reviewed. First, these concepts are reviewed separately and later linked to establishing a general concept of BMI for technology entrepreneurship. The selection process and eligibility were summarized in Table 1.

Although there are many papers with the search term, some articles that give a highly different meaning and are far from the topic of study have been removed through the screening process. In general, the following procedures were followed. First, by focusing on the framework used to create BMiFTE toward economic sustainability, a total of 828 articles were recorded after the exclusion criteria. Next, by analyzing titles, 326 articles were excluded. After abstract and keywords were analyzed, 346 nonrelevant articles were excluded. The items that are not suitable for the research question are excluded from the review and focus on the framework used to create the BMI for technology entrepreneurship with the analysis of full paper, and 146 articles were eliminated. Finally, duplicated articles were removed and articles relevant from the traditional review were added. Accordingly, only 49 articles were verified and analyzed.

Table 1. Selection Process and Eligibility.

Search items	BMI	TE	Total	Criteria
Total articles after exclusion criteria	N = 613	N = 215	N = 828	Screening
Title-based relevance	N = 435	N = 67	N = 502	
Abstract-based relevance	N = 119	N = 37	N = 156	
Full text and research question relevance	N = 38	N = 9	N = 47	Eligibility
After duplicated articles were eliminated	N = 42			Included
Relevant from traditional review	N = 7			
Final relevant articles	N = 49			

Note. BMI = business model innovation; TE = technology entrepreneurship.

Data Analysis and Synthesis

The synthesis was made to find the relevant findings and summarize essential knowledge of the research domain, to understand the big picture of a particular domain by reducing the irrelevant ideas. Business plans, business cases, working papers, and articles not written in English were excluded. A qualitative research method is chosen to analyze the data collected from existing literature. Using this approach, the theoretical aspects of BMI in technology entrepreneurship were described and interpreted. For this qualitative research, a systematic review process was undertaken because a systematic review is used to identify, evaluate, and synthesize the available literature as its comprehensive, explicit, and reproducible approach (Fink, 2005). It also includes systematically searching the literature. Moreover, Rousseau et al. (2008) argue that systematic literature review has importance in analysis transparency and avoiding implicit biases. In general, the systematic review covers plan and searching strategy derived to lessen bias by finding, scrutinizing, and synthesizing the relevant studies (Uman, 2011).

Based on the research question, the selected articles were organized based on the themes of inputs, processes, and outputs of business model innovation. The analysis is focused on the concept, processes, and frameworks. Accordingly, the logic and arguments of various scholars were compared and a conclusion was drawn based on the synthesized arguments.

Quality Assessment and Data Extraction

To assure the quality of the research, the researcher has to document literature findings, the selection of keywords, and the evaluation of the result (Brocke, 2019). After these have been done, data were extracted by two independent reviewers. A disagreement between reviewers was discussed with the reviewer and reached consensus. Moreover, duplicate articles were manually identified and removed. In case a full-text article was not accessed, the authors were communicated, and if no reply was received, the article was excluded from the study.

The articles for review were identified from GS and checked for paper's quality using the JIF of WoS and SJR of

Scopus. Accordingly, from a total of 49 reviewed journals, 44 (89.80) classified as Q1 as a ranking of SJR quartile. Only five articles from four journals each categorized under Q2 and Q3, respectively, were added because of their relevance. This is done to include concepts from technology entrepreneurship as it is not adequate. Some journal articles have been removed due to not being indexed and ranked by JIF or SJR.

Analysis and Discussion

Orchestrating the BMI for Technology Entrepreneurship

To change the existing business model, entrepreneurs are looking to the other companies' practice, searching for new markets, and a new way of doing things. Accordingly, the techno-entrepreneurs will be involved in R&D, experiment, generating, designing, renewing, changing, and implementation. These processes may not be successful without having an appropriate strategy that leads to better performance and further to a firm's economic sustainability. The first step for innovative firms is recognizing the existence of unrequited customer needs (Teece, 2016). This will be done by conducting R&D and networking. In doing this, the consideration of value creation and migration is an essential activity. Moreover, the assessment of dynamic capability and financial requirements, as well as opportunity and risk assessment, will be done in this regard. Therefore, the entrepreneurs should effectively integrate the above elements in experimenting, designing, renewing, and changing the business model. By orchestrating the above elements and components of the business model, it may be modified or fully changed. Theoretically, these processes are studied by various scholars as summarized in Table 3.

To sum up the above processes, the newly developed and experimented business model needs modification, renewal, configuration, and later implementation. These elements will be considered as the processes following and supporting each other, rather than independent elements. Accordingly, the above elements should be integrated as the improvement or change in one component affects the other. However, there

Table 2. Selected Journals Impact Factor and Rankings.

Journal	2018 JIF (WoS)	<i>h</i> -index	2018 SJR IF	SJR quartile	Publisher
<i>Academy of Management Annals</i>	12.289	51	12.7	Q1	Academy of Management
<i>Academy of Management Review</i>	10.632	242	9.32	Q1	Academy of Management
<i>Journal of Management</i>	9.056	192	7.94	Q1	Sage Publications Inc.
<i>Organization and environment</i>	8.5	48	2.61	Q1	Sage Publications Inc.
<i>Journal of Cleaner Production</i>	6.395	150	1.62	Q1	Elsevier Sci Ltd.
<i>Business Strategy and the Environment</i>	6.381	84	2.17	Q1	Wiley
<i>Journal of Business Venturing</i>	6.333	253	8.84	Q1	Elsevier
<i>Entrepreneurship theory and practice</i>	6.193	121	5.07	Q1	Sage Publications Inc.
<i>Research policy</i>	5.425	206	3.41	Q1	Elsevier
<i>Technovation</i>	5.250	111	2.3	Q1	Elsevier
<i>Industrial Marketing Management</i>	4.779	114	2.38	Q1	Elsevier Science Inc.
<i>Journal of Business Research</i>	4.028	158	1.68	Q1	Elsevier Science Inc.
<i>Academy of Management Perspectives</i>	3.857	115	3.35	Q1	Academy of Management
<i>Technological Forecast and Social Change</i>	3.815	93	1.42	Q1	Elsevier Science Inc.
<i>Journal of Product Innovation Management</i>	3.781	126	2.97	Q1	Wiley
<i>Small Business Economics</i>	3.555	108	1.91	Q1	Springer
<i>International Journal of Electronic Commerce</i>	3.439	73	1.63	Q1	Routledge Journals
<i>Long Range Planning</i>	3.363	89	2.04	Q1	Elsevier Sci Ltd.
<i>Organization Science</i>	3.257	211	6.55	Q1	Informa
<i>Strategic Organization</i>	3.109	47	2.55	Q1	Sage Publications Ltd.
<i>British Accounting Review</i>	2.984	56	1.12	Q1	Elsevier Sci Ltd.
<i>Strategic Entrepreneurship Journal</i>	2.956	31	2.82	Q1	Wiley
<i>European Journal of Information Systems</i>	2.603	96	2.04	Q1	Taylor & Francis Ltd.
<i>R & D Management</i>	2.354	91	1.16	Q1	Wiley
<i>MIT Sloan Management Review</i>	2.196	87	1.16	Q1	Sloan Management Review Association
<i>Management Decision</i>	1.962	82	0.73	Q1	Emerald Group Publishing Ltd.
<i>Industrial and Corporate Change</i>	1.824	95	1.51	Q1	Oxford University Press
<i>European Management Review</i>	1.600	27	0.68	Q1	Wiley Periodicals, Inc.
<i>International Journal of Technology Management</i>	1.160	51	0.5	Q1	Inderscience Enterprises Ltd.
<i>Advances in Strategic Management</i>	0.745	25	1.3	Q1	Emerald Group Publishing Ltd.
<i>Journal of Strategic Marketing</i>	ESCI	42	0.83	Q1	Routledge Journals
<i>Communications of Association for Information System</i>	ESCI	38	0.57	Q1	Association for Information Systems
<i>Technology Analysis and Strategic Management</i>	1.739	60	0.72	Q2	Routledge Journals
<i>International Journal of Innovation and Sustainable Development</i>	ESCI	18	0.2	Q3	Inderscience Enterprises Ltd.
<i>International Journal of Product Development</i>	—	22	0.23	Q3	Inderscience Enterprises Ltd.
<i>International Journal Electron Business</i>	—	6	0.19	Q3	Inderscience Enterprises Ltd.

Note. JIF = journal impact factor; WoS = Web of Science; IF = impact factor; SJR = SCImago Journal Rank.

Source: Compiled by authors, 2020

is a predicament to decide the best tool for BMI as it depends on the nature of the business and competition. On the contrary, the suitability will be determined by the simplicity and capacity of the firms. For instance, for firms that lack

important resources, developing and experimenting with a new business model is challenging, whereas alignment and replication may not be fruitful in a highly competitive market.

Table 3. Processes, Inputs, and Outcomes of BMI for Technology Entrepreneurship.

Contributions	Authors
Modification/ improvement	Abdelkafi et al., 2013; Aversa et al., 2015; Demil & Lecocq, 2010; Fjeldstad & Snow, 2018; Kulins et al., 2016; Laasch, 2018; Ritter & Lettl, 2018; Teece, 2018; Zott & Amit, 2010
Interaction with technology	Baden-Fuller & Haeffliger, 2013; Bailetti, 2012; Chesbrough, 2007, 2010; Chesbrough & Rosenbloom, 2002; Khefacha & Belkacem, 2016; Roome & Louche, 2016; Sabatier et al., 2012; Teece, 2010
Develop/generate	Amit & Zott, 2010; Berends et al., 2016; Fjeldstad & Snow, 2018; Futterer, 2014; Futterer et al., 2018; Osterwalder & Pigneur, 2010; Spieth & Schneider, 2016
Experimentation	Bojovic et al., 2018; Foss & Stieglitz, 2015; Sosna et al., 2010
Design	Aversa et al., 2015; Demil & Lecocq, 2010; Fjeldstad & Snow, 2018; Kulins et al., 2016; Laasch, 2018; Teece, 2018; Zott & Amit, 2007, 2010
Change/renew	Amit & Zott, 2012; Aspara et al., 2013; Chesbrough, 2010; De Reuver et al., 2009; Foss & Saebi, 2017; Futterer, 2014; Futterer et al., 2018; Schneider & Spieth, 2013; Spieth et al., 2014; Spieth & Schneider, 2016; Velu, 2017
Commercialization	Chesbrough & Rosenbloom, 2002; DaSilva et al., 2013
Configuration	Baden-Fuller & Mangematin, 2013
Implement	Al-Debei & Avison, 2010; Hiennerth et al., 2011; Standing & Mattsson, 2016; Teece, 2010
Value migration	Amit & Zott, 2001; Baden-Fuller & Mangematin, 2013; Foss & Saebi, 2017; Hacklin et al., 2018; Jabłonski, 2018; Roome & Louche, 2016; Shafer et al., 2005; Teece, 2010
Dynamic capability	Achtenhagen et al., 2013; Bjorkdahl & Holmen, 2013; Chesbrough, 2010; Hacklin et al., 2018; Leih et al., 2015; Massa et al., 2017; Ritter & Lettl, 2018; Sanchez & Ricart, 2010; Teece, 2018; Zott et al., 2011
Strategy	Casadesus-Masanell & Feng, 2010; Casadesus-Masanell & Ricart, 2010; Chesbrough, 2010; Cosenz & Noto, 2018; De Reuver et al., 2009; Markides, 2006; Priem et al., 2018; Santos et al., 2015; Teece, 2018
Opportunities & risk assessment	Alvarez et al., 2013; Eckhardt, 2013; Khefacha & Belkacem, 2016; Shi & Manning, 2009
Institutional ontology	Randles & Laasch, 2016; Upward & Jones, 2016
Stakeholders and Networking	Ferreira et al., 2013; Lechner & Hummel, 2002; Lund & Nielsen, 2014; Ritter & Lettl, 2018; Snihur & Tarzijan, 2018; Zott & Amit, 2007
Resources	Bollingtoft et al., 2005; Guidici & Paleari, 2000; Robb & Coleman, 2010
Entrepreneurial logics	Futterer et al., 2018; Mehrizi & Lashkarbolouki, 2016; Sosna et al., 2010
Economic sustainability	Beattie & Smith, 2013; Bocken et al., 2014; Gauthier & Gilomen, 2016; Khefacha & Belkacem, 2016; Lowitt, 2013; Schaltegger et al., 2012; Upward & Jones, 2016
Performance/growth	Amit & Zott, 2001; Futterer et al., 2018; Khefacha & Belkacem, 2016; Kim & Min, 2015; Sabatier et al., 2010; Santos et al., 2015; Shi & Manning, 2009; Snihur & Tarzijan, 2018; Zott & Amit, 2007

Note. BMI = business model innovation.

The continuous assessment of opportunities to innovate new technology and commercializing them and the firm's dynamic capability and their ability to use a firm's assets were linked to BMIfTE. Moreover, to successfully improve the business model, the firm should think of how the value will be captured by establishing a network with all stakeholders. Therefore, it is important to consider the long-term objectives to link these elements of BMIfTE to economic sustainability. In summary, the BMIfTE was backed by several factors that contribute to performance and growth. These various inputs were indicated in Table 3.

To improve and modify the existing business model, organizational resources and capabilities are highly required. This capability helps in creating and capturing value in technology entrepreneurship. It is impossible to develop a successful business model without resources. Therefore, the value of the firm is created through the deployment of human capital and financial resources. In addition, networking with different actors plays a crucial role in modifying the existing business model as it helps to obtain various inputs used for

modifying the existing business model. Moreover, there must be a strong relation and collaboration between supplier organizations, distributors, and other stakeholders to build a successful network-based business model.

Modeling BMI for Technology Entrepreneurship

Technology entrepreneurship assembles and deploys manpower and existing assets to create and capture value (Bailetti, 2012). The methods of creating and capturing values were central to technology entrepreneurship and the foundation for a business model (Muegge, 2012). According to Khefacha and Belkacem (2016), technology entrepreneurship resides in creating and exploiting technologies, recognition/matching technologies, development of technology applications, and business creation. Therefore, the integration between technology entrepreneurship and business model is proven by value creation and value capturing is established (Muegge, 2012). By taking into consideration this integration, BMI is characterized by value networking (Roome & Louche, 2016) and

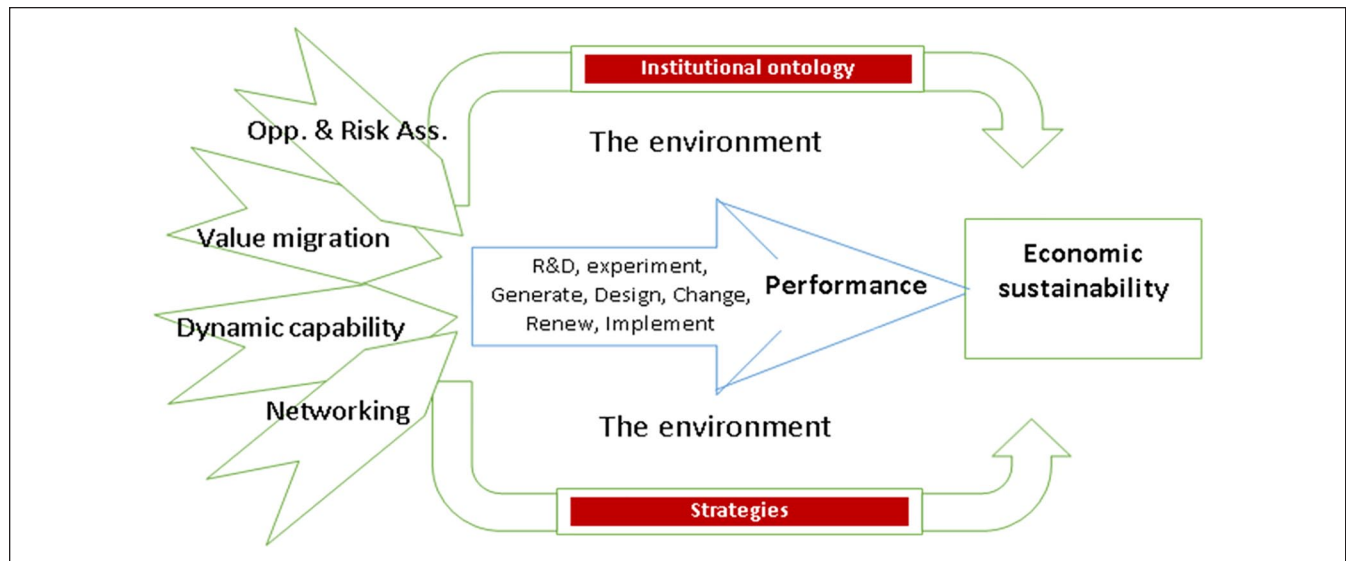


Figure 1. The structure of BMI for technology entrepreneurship.
 Note. BMI = business model innovation.

creating entrepreneurial opportunities (Markides, 2006) using technological entrepreneurship.

In general, among the conceptual relationships, many authors relate BMI with opportunity exploitation (e.g., Khefacha & Belkacem, 2016), value migration (e.g., Hacklin et al., 2018; Jablonski, 2018), dynamic capability (e.g., Ritter & Lettl, 2018; Teece, 2018), and networking (e.g., Ritter & Lettl, 2018; Snihur & Tarzijan, 2018). In all this practice, the adoption of new technologies through a dynamic process of creative destruction contributes to long-term economic growth (Khafacha & Belkacem, 2016). To summarize, business models are used to create (Chesbrough & Rosenbloom, 2002) and capture values (Teece, 2010) through developing (e.g., Fjeldstad & Snow, 2018; Futterer et al., 2018), experimenting (e.g., Bojovic et al., 2018), renewing (e.g., Foss & Saebi, 2017), and commercializing (e.g., DaSilva et al., 2013) the business model.

The entrepreneurial activities create and capture economic values from exploiting new or existing technologies (Roja & Năstase, 2014). The business model was linked to firm performance (Trimi & Berbegal-Mirabent, 2012) and considered as drivers of firm performance (Rajgopal et al., 2003). Networks are positively associated with innovativeness and performance (Pittaway et al., 2004; van Wijk et al., 2008). Particularly BMI determines the firm's performance (Zott & Amit, 2007), whereas in the long, the dynamic role of entrepreneurial activity in the technology sector promotes economic growth (Khafacha & Belkacem, 2016). That is, technology entrepreneurship is a driver of economic progress (Roja & Năstase, 2014). Moreover, the critical success factors for BMI should be considered. Particularly, Brem (2008) found that the number of years of working experience and willingness to take risks, business plan, clear strategy,

innovation, network, advisory board, and active marketing are success factors for a starting firm. Most of these critical factors were included under the inputs stated in Figure 1.

To be sustainable, business models must be innovative and capture new technological progress. That is, entrepreneurs are involved in innovating products/services, technologies, markets, and methods through experimentation and risk-taking to create sustainable value. More specifically, the journey toward economic sustainability considers a firm's capture values. Sustainable business development can contribute not only to the firm's growth but also for society and the economy as a whole. Sustainability can also occur from technology entrepreneurship. Therefore, there must be an improvement in networking, stakeholder analysis, and customer interfaces to create sustainable value that will further fulfill society's demand. The innovativeness of the business model will help to overcome the problem associated with sustainable development by integrating the financial and economic values from the business model. Figure 1 depicts the overall structure of BMI for technology entrepreneurship.

The development and selection of the appropriate strategy will lead to value creation from different aspects. The strategies in technological entrepreneurship may consider both financial resources, the varied skills, and techniques in consideration to customers and their value. These strategies are contributed to better financial performance and in the long run to economic performance because the strategies focus on how the values created and captured by getting to a new market, develop new products and processes that will entice the customers.

The efficient combination of BMI/TE elements will lead to better performance. This happened through the exploitation of opportunities by minimizing risks, efficient use of a

firm's assets, value capturing through networking, and value migration. When the values started to be captured through institutional ontology, sustainability will be ensured. Finally, the innovation in a business model which is provoked by dynamic capability, value migration, exploitation of opportunity, and stakeholder networking was associated with sustainability.

Technology entrepreneurship involves combined experimentation and production of products in consideration of the technological and scientific advancement (Bailetti, 2012), which many technology firms belong to. That is, the value creation and capturing through the business model of technological entrepreneurship are useful and practicable among firms that need to innovate and adopt technological advancements. However, the existing framework of value configuration and partnership structuring from the network-based business model is poorer (Lund & Nielsen, 2014). Therefore, developing BMIfTE is crucial from the viewpoint of its concepts; technology entrepreneurship searches solutions for problems (Groenewegen & de Langen, 2012), through opportunity exploitation from emerging technologies, organization, management, and risk bearing (Bailetti, 2012). This is based on value creation and capture, target organizations, mechanism of delivery, and the interdependence of these mechanisms (Bailetti, 2012), which are interrelated through the business model. Accordingly, BMIfTE needs to be applied by many ventures to cope with the advancement of science and technology.

Conclusion, Contribution, and Implications for Future Research

Conclusion

This study draws a BMI for techno-entrepreneurship that leads to economic sustainability. It gives clues on the necessity to reinvent and reshape the business models in consideration of factors such as dynamic capability, existing opportunity and risks, value migration, and networking with stakeholders. The study overviews the various elements of BMI for technology entrepreneurship and revealed the relations of strategic decision and institutional ontology with resources, activities, and processes. Accordingly, the values captured from networking and relationships with different stakeholders and organizations help to create adequate value from the collaboration. In addition, the discovery and exploitation of new technological opportunities have to be continuous for the economic sustainability of BMIfTE. In general, the BMI for technology entrepreneurship can be operationalized as the process in which the new business activities are experimented, designed, generated, renewed, and implemented to create and capture value from constellations of firm's institutional strategies (such as opportunity assessment, value migration, dynamic capability, and stakeholders networking) and environmental factors.

Contributions

Regardless of the deep conceptual link between business models and technology entrepreneurship, still little is recognized as how technology entrepreneurship produces a fruitful business model (Muegge, 2012). This study contributes to the discipline of BMI and technology entrepreneurship by bringing the subject matter under one umbrella. In addition, it covers the various elements, components, and processes in BMIfTE. Furthermore, it shows these elements and processes accomplishment with the strategy and institutional ontology toward the firm's performance and economic sustainability. In this sense, the article identifies the important inputs, processes, and outcomes of BMI for technology entrepreneurship.

The developed model linked the drivers of BMIfTE at the back and the outcomes of successful BMI at the front with the processes at the center. More specifically, the model structured the BMIfTE as obtained through experimentation, designing, generating, renewing, changing, and implementation, backed by inputs such as value migration, opportunity and risk assessment, dynamic capability, stakeholders networking, firms' strategy, and institutional ontology. Most of the previous studies did not include the assessment of existing opportunities and threats in developing an innovative business model. This study tries to include the contribution of opportunity and risk assessment.

Regarding the components of business model, first, the study tried to connect the business model with technological aspects logically and coherently. From this, BMI for technology entrepreneurship has been conceptualized and defined. Second, it considers the relationship between BMIfTE and the firm's performance and economic sustainability. Third, the study recognized the nontriviality of BMIfTE by sensing the underpinning of BMIfTE components. Moreover, the various aspects of BMI were summarized under a few specific variables and a new model for technology entrepreneurs has been orchestrated. The stakeholder networking, for instance, associated with several factors, simultaneously including the key partners and customers and their channels. The capabilities of firms are associated with key resources (i.e., financial and human capital), through which values have been obtained, while the value migration covers the issues of value proposition, configuration, and customer value creation and value capture. Finally, by considering the premises of several scholars, an all-inclusive business model with different aspects that contribute to the successfulness of the firm was developed.

Limitations and Future Research Avenue

It is known that the scientific value of the study will be strong when it is supported by empirical data such as data obtained through interviews. However, this study has a limitation of not considering the empirical data that support in integrating

theoretical outputs with the managerial practices. The variables covered under this study may not be comprehensive, mainly from the external environment. Moreover, the specific technological sector for the application of the model needs to be indicated. Regarding the data's limitation, many irrelevant articles that appeared from GS were removed manually. The data quality and reliability also were poor in GS.

Based on the reviews, the study recommends the following implications for future research. The future research might study the specific activities in social and environmental factors that highly integrated with the BMI for technology entrepreneurs. The study of BMI for technology entrepreneurship is less in general and very weak in sub-Saharan Africa. Therefore, we propose a direction for further research to focus on this region on the stated topic. Several papers were reviewed theoretically from literature and case studies; however, it was not tested whether it is suitable for developing economies. Therefore, an experimental research design has been suggested for further research conducted on the subject matter.

One of the challenges among technology entrepreneurship is linking their business model with sustainability, which is not considered widely with previous researches. This is another area that needs consideration for researchers interested in the area of technology entrepreneurship. The technology innovation is meaningless unless commercialized through an appropriate business model. This means technology entrepreneurship and BMI are dependent on each other. While some authors consider BMI after technology entrepreneurship, the others bring the BMI before technology entrepreneurship. Therefore, future researchers should clarify and strengthen the variable BMIfTE. In addition, rather than testing multiple variables simultaneously, it is crucial to know the level of their impact independently.

Most of the previous studies forget the assessment of existing opportunities and threats separately as a variable in the business model. This study gives a clue for future researches on the way opportunity and risk assessment are affected in the BMI for technology entrepreneurship. In addition, several studies have shown the importance of technology entrepreneurship for wealth and job creation; however, the specific contributing variables were discussed in a nutshell. The underpinning for BMIfTE was recognized in this study, but it needs a more in-depth study for each particular variable. Finally, the practice of BMIfTE may not be successful similarly in all sectors. Therefore, identifying and differentiating the industries that are suitable for commercialization of technology entrepreneurship is another issue that needs clarification. Moreover, future researchers should consider the commercialization of technology-based innovations through digitization and online marketing.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Submission Declaration and Verification

The authors declare that the article has not been published previously in any form and in any language.

ORCID iD

Abdella Kosa Chebo  <https://orcid.org/0000-0003-0013-5899>

References

- Abdelkafi, N., Makhotin, S., & Posselt, T. (2013). Business model innovations for electric mobility—What can be learned from existing business model patterns? *International Journal of Innovation Management*, 17, 1–41.
- Abdelkafi, N., & Täuscher, K. (2016). Business models for sustainability from a system dynamics perspective. *Organization & Environment*, 29, 74–96.
- Achtenhagen L., Melin L., & Naldi L. (2013). Dynamics of business models – Strategizing, critical capabilities and activities for sustained value creation. *Long Range Planning*, 46(6), 427–442.
- Al-Debei, M. M., & Avison, D. (2010). Developing a unified framework of the business model concept. *European Journal of Information Systems*, 19, 359–376.
- Alvarez S., & Jay Barney J B., & Anderson P. (2013). E forming and exploiting opportunities: The implications of discovery and creation processes for entrepreneurial and organizational research. *Organization Science*, 24(1), 301–317.
- Amara, N., & Landry, R. (2012). Counting citations in the field of business and management: Why use Google Scholar rather than the Web of Science. *Scientometrics*, 93, 553–581.
- Amit, R., & Zott, C. (2001). Value creation in E-business. *Strategic Management Journal*, 22, 493–520.
- Amit, R., & Zott, C. (2010, November). *Business model innovation: Creating value in times of change* (IESE Business School Working Paper No. 870). <http://dx.doi.org/10.2139/ssrn.1701660>
- Amit, R., & Zott, C. (2012). Creating value through business model innovation. *MIT Sloan Management Review*, 53, 41–49.
- Aspara, J., Lamberg, J-A., Laukia, A., & Tikkanen, H. (2013). Corporate business model transformation and inter-organizational cognition: The case of Nokia. *Long Range Planning*, 46(6), 459–474.
- Aversa, P., Haeffliger, S., Rossi, A. and Baden-Fuller, C. (2015). From business model to business modelling: Modularity and manipulation. *Business Models and Modelling*, 33, 151–185. <https://doi.org/10.1108/S0742-332220150000033022>
- Baden-Fuller, C., & Haeffliger, S. (2013). Business models and technological innovation. *Long Range Planning*, 46, 419–426.
- Baden-Fuller, C., & Mangematin, V. (2013). Business models: A challenging agenda: State-of-the-art and steps towards a research agenda. *Strategic Organization*, 11, 418–427.
- Bailetti, T. (2012). Technology entrepreneurship: Overview, definition, and distinctive aspects. *Technology Innovation Management Review*, 2, 5–12. <https://doi.org/10.22215/timreview/520>

- Beattie, V., & Smith, S. J. (2013). Value creation and business models: Refocusing the intellectual capital debate. *The British Accounting Review*, 45, 243–254.
- Berends, H., Smits, A., Reymen, I., & Podoynitsyna, K. (2016). Learning while (re)configuring: Business model innovation processes in established firms. *Strategic Organization*, 14, 181–219.
- Bjorkdahl, J., & Holmen, M. (2013). Business model innovation: The challenges ahead. *International Journal of Product Development*, 18, 213–225.
- Bocken, N. M. P., Short, S. W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production*, 65, 42–56.
- Bojovic, O., Medenica, M., Zivkovic, D., Rakocevic, B., Trajkovic, G., Kiscic-Tepavcevic, D., & Grgurevic, A. (2018). Factors associated with patient and health system delays in diagnosis and treatment of tuberculosis in Montenegro, 2015–2016. *PLOS ONE*, 13, Article e0193997. <https://doi.org/10.1371/journal.pone.0193997>
- Bøllingtoft, A., & Ulhøi, J. P. (2005). The networked business incubator—Leveraging entrepreneurial agency? *Journal of Business Venturing*, 20(2), 265–290.
- Brem, A. (2008). *The boundaries of innovation and entrepreneurship*. Friedrich-Alexander-Universität Erlangen-Nürnberg.
- Casadesus-Masanell, R., & Ricart, J. E. (2010). From strategy to business models and onto tactics. *Long Range Planning*, 43(2–3), 195–215.
- Casadesus-Masanell, R., & Zhu, F. (2010). Strategies to fight ad-sponsored rivals. *Management Science*, 56(7), 1484–1499.
- Chebo, A. K., & Kute, I. M. (2018). Uncovering the unseen passion: A fire to foster ambition toward innovation. *World Journal of Entrepreneurship, Management and Sustainable Development*, 14, 126–137.
- Chebo, A. K., Kute, I. M., & Gebre, D. A. (2018). Entrepreneurial orientation and venture performance in Ethiopia: The moderating role of business sector and enterprise location. *Journal of Global Entrepreneurship Research*, 8, 25.
- Chesbrough, H. (2007). Business model innovation: It's not just about technology anymore. *Strategy & Leadership*, 35(6), 12–17.
- Chesbrough, H. (2010). Business model innovation: Opportunities and barriers. *Long Range Planning*, 43, 354–363.
- Chesbrough, H., & Rosenbloom, R. S. (2002). The role of business models in capturing value from innovation: Evidence from Xerox corporation's technology spin-off companies. *Industrial and Corporate Change*, 11, 529–555.
- Coleman, S., & Alicia Robb, A. (2009). A comparison of new firm financing by gender: evidence from the Kauffman Firm Survey data. *Small Business Economics*, 33(4), 397–411.
- Cosenz, F., & Noto, G. (2018). A dynamic business modelling approach to design and experiment new business venture strategies. *Long Range Planning*, 51, 127–140.
- DaSilva, C. M., Trkman, P., Desouza, K., & Lindić, J. (2013). Disruptive technologies: A business model perspective on cloud computing. *Technology Analysis and Strategic Management*, 25, 1161–1173.
- Demil, B., & Lecocq, X. (2010). Business model evolution: In search of dynamic consistency. *Long Range Planning*, 43(2–3), 227–246.
- De Reuver M., Bouwman H., & MacInnes I. (2009). Business model dynamics: A case survey. *Journal of Theoretical and Applied Electronic Commerce Research*, 4(1), 1–11.
- Dorf, R. C., & Byers, H. T. (2005). Technology ventures: From idea to enterprise. New York, McGraw-Hill. available at; <https://doc1.bibliothek.li/aak/FLMF007537.pdf>
- Dorf, R. C., & Byers, H. T. (2015). *Technology ventures: From idea to enterprise*. McGraw-Hill.
- Eckhardt, J. T. (2013). Opportunities in business model research. *Strategic Organization*, 11, 412–417.
- Ferreira, F. N. H., Proença, J. F., Spencer, R., & Cova, B. (2013). The transition from products to solutions: External business model fit and dynamics. *Industrial Marketing Management*, 42, 1093–1101.
- Fink, A. (2005). *Conducting research literature reviews: From the internet to paper* (2nd ed.). SAGE.
- Fjeldstad, O. D., & Snow, C. C. (2018). Business models and organization design. *Long Range Planning*, 51, 32–39.
- Foss, N. J., & Saebi, T. (2017). Fifteen years of research on business model innovation: How far have we come, and where should we go? *Journal of Management*, 43, 200–227.
- Foss, N. J., & Stieglitz, N. (2015). Business model innovation: The role of leadership. In N. J. Foss & T. Saebi (Eds.), *The organisational dimension* (pp. 104–122). Oxford University Press.
- Futterer, F. (2014, December 7–10). *Business model and business model innovation: Clarifying two vague concepts* [Paper presentation]. ISPIM Asia-Pacific Innovation Forum, Singapore.
- Futterer, F., Schmidt, J., & Heidenreich, S. (2018). Effectuation or causation as the key to corporate venture success? Investigating effects of entrepreneurial behaviors on business model innovation and venture performance. *Long Range Planning*, 51, 64–81.
- Gauthier, C., & Gilomen, B. (2016). Business models for sustainability: Energy efficiency in urban districts. *Organization & Environment*, 29, 124–144.
- Groenewegen, G., & de Langen, F. (2012). Critical success factors of the survival of start-ups with a radical innovation. *Journal of Applied Economics and Business Research*, 2, 155–171.
- Guerrero-Bote, V. P., & Moya-Anegón, F. (2012). A further step forward in measuring journals' scientific prestige: The SJR2 indicator. *Journal of Informetrics*, 6, 674–688.
- Guidici, G., & Paleari, S. (2000). The provision of finance to innovation: A survey conducted among Italian technology-based small firms. *Small Business Economics*, 14(1), 37–53.
- Hacklin, F., Bjorkdahl, J., & Wallin, M. W. (2018). Strategies for business model innovation: How firms reel in migrating value. *Long Range Planning*, 51, 82–110.
- Hansen, J., Strick, M., Baaren, R. B., Hooghuis, M., & Wigboldus, D. H. J. (2009). Exploring memory for product names advertised with humour. *Journal of Consumer Behaviour*, 8, 135–148.
- Hiennerth C, Keinz P, Lettl C (2011) Exploring the nature and implementation process of user-centric business models. *Long Range Plan*, 44(5), 344–374.
- Ireland, R. D., Hitt, M. A., Camp, M., & Sexton, D. L. (2001). Integrating entrepreneurship and strategic management actions to create firm wealth. *The Academy of Management Executive*, 15, 49–63.
- Jablonski, M. (2018). Value migration to the sustainable business models of digital economy companies on the capital market. *Sustainability*, 10, 3113.

- Jesson, J. (2011). Doing your literature review: Traditional and systematic techniques. *Educational Research and Evaluation*, 24, 219–221.
- Khefacha, I., & Belkacem, L. (2016). Technology-based ventures and sustainable development: Cointegrating and causal relationships with a panel data approach. *The Journal of International Trade & Economic Development*, 25, 192–212.
- Kim, S. K., & Min, S. (2015). Business model innovation performance: When does adding a new business model benefit an incumbent? *Strategic Entrepreneurship Journal*, 9, 34–57. <https://doi.org/10.1002/sej.1193>
- Kosa, A., & Mohammad, I. (2017). Uncovering the backings to passion: Why do small firm owners/managers engage in entrepreneurship? *Journal of Innovation and Entrepreneurship*, 6, 20.
- Kulins C., Leonardy H., & Weber C. (2016). A configurational approach in business model design. *Journal of Business Research*, 69, 1437–1441.
- Laasch, O. (2018). Beyond the purely commercial business model: Organizational value logics and the heterogeneity of sustainability business models. *Long Range Planning*, 51(1), 158–183.
- Lechner U., & Hummel J. (2002). Business models and system architectures of virtual communities: From a sociological phenomenon to peer-to-peer architectures. *International Journal of Electronic Commerce*, 6(3), 41–53.
- Leih, S., Linden, G., Teece, D.J. (2015). Business model innovation and organizational design: a dynamic capabilities perspective. In: Foss, N. J., Saebi, T. (Eds.), *Business Model Innovation: the Organizational Dimension* (pp. 24–42). Oxford University Press, Oxford.
- Lowitt, E. (2013). *The collaboration economy: How to meet business, social, and environmental needs and gain competitive advantage hardcover* (1st ed.). Jossey-Bass.
- Lund, M., & Nielsen, C. (2014). The evolution of network-based business models illustrated through the case study of an entrepreneurship project. *Journal of Business Models*, 2, 105–121.
- Mahdi, S., D'Este, P., & Neely, A. (2008). *Citation counts: Are they good predictors of RAE scores?* AIM Research.
- Markides, C. (2006). Disruptive innovation: In need of better theory. *Journal of Product Innovation Management*, 23, 19–25.
- Massa, L., Tucci, C., & Afuah, A. (2017). A critical assessment of business model research. *Academy of Management Annals*, 11, 73–104.
- Mehrizi MHR, & Lashkarbolouki M. (2016). Unlearning troubled business models: from realization to marginalization. *Long Range Planning*, 49(3), 298–323.
- Mendelson, H. (2010). Organizational architecture and success in the information technology industry. *Management Science*, 46, 513–529. <https://doi.org/10.1287/mnsc.46.4.513.12060>
- Muegge, S. (2012). Business model discovery by technology entrepreneurs. *Technology Innovation Management Review*, 2, 5–16. <https://doi.org/10.22215/timreview/545>
- Nickerson, J., & Zenger, T. (2004). A knowledge-based theory of the firm: The problem-solving perspective. *Organization Science*, 15, 617–632.
- Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: A handbook for visionaries, game changers, and challengers*. John Wiley.
- Pittaway, L., Robertson, M., Munir, K., Nenyer, D., & Neely, A. (2004). Networking and innovation: A systematic review of the evidence. *International Journal of Management Reviews*, 5–6, 137–168.
- Priem R. L., Wenzel M., & Koch J. (2018). Demand-side strategy and business models: Putting value creation for consumers center stage. *Long Range Planning*, 51(1), 22–31.
- Rajgopal, S., Venkatachalam, M., & Kotha, S. (2003). The value relevance of network advantages: The case of e-commerce firms. *Journal of Accounting Research*, 41, 135–162.
- Randles S., & Laasch O. (2016). Theorising the normative business model. *Organization & Environment*, 29(1), 53–73.
- Ritter, T., & Lettl, C. (2018). The wider implications of business-model research. *Long Range Planning*, 51, 1–8.
- Roja, A., & Năstase, M. (2014, November 6–7). *Technology entrepreneurship and entrepreneurial strategies* [Conference session]. 8th International Management Conference Management Challenges for Sustainable Development, Bucharest, Romania.
- Roome, N., & Louche, C. (2016). Journeying toward business models for sustainability: A conceptual model found inside the black box of organizational transformation. *Organization & Environment*, 29, 11–35.
- Rousseau, D. M., Manning, J., & Denyer, D. (2008). Evidence in management and organizational science: Assembling the field's full weight of scientific knowledge through syntheses. *Academy of Management Annals*, 2, 475–515.
- Sabatier V., Kennard A., & Mangematin V. (2012). When technological discontinuities and disruptive business models challenge dominant industry logics: Insights from the drugs industry. *Technological Forecasting and Social Change*, 79(5), 949–962.
- Sabatier, V., Mangematin, V., & Rousselle, T. (2010). From recipe to dinner: Business model portfolios in the European biopharmaceutical industry. *Long Range Planning*, 43, 431–447.
- Sánchez, P., & Ricart, J. (2010). Business model innovation and sources of value creation in low-income markets. *European Management Review*, 7, 138–154.
- Santos, J., Spector, B., & Van den Heyden, L. (2015). Towards a theory of business model innovation within incumbent firms. In N. Foss & T. Saebi (Eds.), *Business model innovation: The organizational dimension* (pp. 43–63). Oxford University Press.
- Schaltegger, S., Lüdeke-Freund, F., & Hansen, E. G. (2012). Business cases for sustainability: The role of business model innovation for corporate sustainability. *International Journal of Innovation and Sustainable Development*, 6, 95–119.
- Schneider, S., & Spieth, P. (2013). Business model innovation: Towards an integrated future research agenda. *International Journal of Innovation Management*, 17(1), 1–34.
- Shafer, S. M., Smith, H. J., & Linder, J. C. (2005). The power of business models. *Business Horizons*, 48, 199–207.
- Shi, Y. and Manning, T. (2009). Understanding business models and business model risks, *The Journal of Private Equity*, 12(2), 49–59.
- Snihur, Y., & Tarzijan, J. (2018). Managing complexity in a multi-business-model organization. *Long Range Planning*, 51, 50–63.
- Sosna M., Trevinyo-Rodriguez R N., & R Velamuri S R. (2010). Business model innovation through trial-and-error learning: The naturhouse case. *Long Range Planning*, 43(2), 383–407.

- Spieth P., Schneckenberg D., & Ricart J E. (2014). Business Model Innovation – State of the Art and Future Challenges for the Field. *R&D Management*, 44(3).
- Spieth, P., & Schneider, S. (2016). Business model innovativeness: Designing a formative measure for business model innovation. *Journal of Business Economics*, 86, 671–696.
- Standing C., & Mattsson J. (2016). “Fake it until you make it”: business model conceptualization in digital entrepreneurship. *Journal of Strategic Marketing*, 26(5), 385–399.
- Teece, D. J. (2010). Business models, business strategy and innovation. *Long Range Planning*, 43, 172–194.
- Teece, D. J. (2016). Dynamic capabilities and entrepreneurial management in large organizations: Toward a theory of the (entrepreneurial) firm. *European Economic Review*, 86(C), 202–216.
- Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51, 40–49.
- Trimi, S., & Berbegal-Mirabent, J. (2012). Business model innovation in entrepreneurship. *International Entrepreneurship and Management*, 8, 449–465.
- Uman, L. S. (2011). Systematic reviews and meta-analyses. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, 20, 57–59.
- Upward, A., & Jones, P. H. (2016). An ontology for strongly sustainable business models: Defining an enterprise framework compatible with natural and social science. *Organization & Environment*, 29, 97–123.
- van Wijk, R., Jansen, J. J. P., & Lyles, M. A. (2008). Inter- and intra-organizational knowledge transfer: A meta-analytic review and assessment of its antecedents and consequences. *Journal of Management Studies*, 45, 830–853.
- Velu, C. (2017). A systems perspective on business model evolution: The case of an agricultural information systems provider in India. *Long Range Planning*, 50, 603–620.
- Visnjic, I., Wiengarten, F., & Neely, A. (2016). Only the brave: Product innovation, service business model innovation, and their impact on performance. *Journal of Product Innovation Management*, 33, 36–52. <https://doi.org/10.1111/jpim.12254>
- Zott, C., & Amit, R. (2007). Business model design and the performance of entrepreneurial firms. *Organization Science*, 18, 181–199.
- Zott, C., & Amit, R. (2010). Business model design: An activity system perspective. *Long Range Planning*, 43(2–3): 216–226.
- Zott, C., Amit, R., & Massa, L. (2011). The business model: Recent developments and future research. *Journal of Management*, 37, 1019–1042.