Business model design and firm performance: Evidence of interactive effects from
a developing economy
Blendi Gerdoçi, Guido Bortoluzzi, Sidita Dibra,

## Article information:

# Business model design and firm performance

## Evidence of interactive effects from a developing economy

Blendi Gerdoçi
*Faculty of Economics, University of Tirana, Tirana, Albania*
Guido Bortoluzzi
*DEAMS, University of Trieste, Trieste, Italy, and*
Sidita Dibra
*Faculty of Economics, University of Tirana, Tirana, Albania*

**Abstract**

**Purpose** – The purpose of this paper is to contribute to the literature on business model (BM) design by deepening the relationship between BM design themes and performance in a sample of firms based in a developing country. In particular, the authors deepen the relationship between business model novelty (BMN), business model efficiency (BME), the trade-off between novelty and efficiency – that the authors call BM ambidexterity – and performance.

**Design/methodology/approach** – Data are drawn from a sample of 107 manufacturing and service firms based in a developing country (Albania). Hierarchical regression is used to assess the impact on firm performance from the two BM design themes and their interaction.

**Findings** – The authors find novelty-centred BM design is significantly related to firm performance while efficiency-centred design has no direct effect on performance. However, the authors also find that BME positively moderates the relationship between BMN and firm performance.

**Research limitations/implications** – The relationship between BM design and firm performance can be better understood if contextualised. In the paper, the authors find that different types of BM designs have different impacts on the performance of firms based in a developing economy. While novelty matters, quite surprisingly the authors find no support for efficiency. Additionally, the authors find the interaction between the two design themes (BM ambidexterity) to have a positive impact on firm performance.

**Practical implications** – The surveyed firms based in a developing economy appear to benefit from novelty-centred BM designs. Efficiency-centred designs have a more ambiguous role: while efficiency alone seems not to pay off, an efficient BM design may facilitate the market exploitation of a novel design.

**Originality/value** – This study responds to a precise call for additional quantitative empirical studies on the relationship between BM and performance. The study also contributes to an emerging stream of research focused on BM ambidexterity.

**Keywords** Performance, Developing countries, Albania, Business model ambidexterity, Business model efficiency, Business model novelty

**Paper type** Research paper

## Introduction

The term "business model" (BM) has become widespread in both the academic and in the managerial world. The literature on BMs has grown steadily over the last few years (Massa *et al.*, 2017). However, this growth has not seen a corresponding increase in quantitative empirical evidence. Indeed, even today, BM literature is dominated by conceptual papers and explorative approaches, especially in the form of case studies (Wirtz *et al.* 2016). Studies relying on "clearly articulated research models that lay out the basic causal web-connecting antecedent, moderating, and mediating variables with the key construct and consequences" (Foss and Saebi, 2017, p. 203) are absent.

This paper responds to the call by addressing the theme of the relationship between BM design and the performance of the firm on a sample of 107 Albanian organisations.

According to Schneider and Spieth (2013), the relationship between BM (and BM change) and the performance of the firm is one of the research areas that mostly demands quantitative evidence. Indeed, despite an increasing convergence around the assumption that BMs directly (co)determine the performance of firms (Afuah and Tucci, 2001; Patzelt *et al.*, 2008; Zott and Amit, 2008; Aspara *et al.*, 2010; Casadesus-Masanell and Ricart, 2011; Christensen *et al.*, 2016), with a few notable exceptions (Patzelt *et al.*, 2008; Aspara *et al.*, 2010), we lack empirical evidence to confirm that this happens in the real world.

Central to our paper is the work by Zott and Amit (2007) who identify and operationalise two major BM design themes, efficiency and novelty, and investigate their relationships with the performance of entrepreneurial firms. While efficiency refers to the capability of a BM to quickly and efficiently enable the nexus of transactions in which the firm is embedded, novelty refers to the novel characteristics of the main constituents of a BM, such as products, services, production methods, distributing methods, etc.

Zott and Amit (2007) first applied their framework to check whether and to what extent the BM design of entrepreneurial firms affects their performance. Other scholars later adopted the same framework to investigate the behaviour of both start-ups and established firms with contrasting results (i.e. Patzelt *et al.*, 2008; Brettel *et al.*, 2012; Hu and Chen, 2016; Pucci *et al.*, 2017).

Zott and Amit (2007) first suggested that novelty and efficiency could also work in synergy, thus advancing an "ambidexterity" hypotheses. Later studies have looked at the phenomenon of BM ambidexterity (Markides, 2013; Kulins *et al.*, 2016; Winterhalter *et al.*, 2016) in more depth, but the entire research stream is still in its infancy.

Our paper contributes to this emergent discussion by providing empirical evidence on the impact that different design themes, and the trade-off between such themes (BM ambidexterity), have on firm performance.

Unlike previous studies, which are predominantly based on developed markets, our research is based in Albania, a post-transition developing country struggling to overcome the legacy of its communist past (World Bank, 2017). In this sense, our study enriches the literature on BM and firm performance in countries characterised by less solid market institutions and unsupportive innovation ecosystems (Khanna *et al.*, 2005).

While finding support for a positive impact of novelty-oriented BM designs on performance, our results do not provide similar support for efficiency-oriented design themes, and contradict previous literature on this aspect. Furthermore, we find that efficiency-oriented BM themes empower novelty-oriented ones, thus confirming the existence of an ambidexterity effect.

The rest of this paper is organised as follows. The second section reviews the theoretical background on BM design themes, BM ambidexterity and firm performance and presents the hypotheses. The third section describes the data analysis methods used and the empirical model proposed by the authors. The fourth section explains the descriptive statistics and the empirical research findings, and the paper ends with a discussion of the results, conclusions, further research recommendations and study limitations.

## Theory and hypotheses development
### BM: concept and approaches
Multiple definitions of BM, some of which differ greatly, can be found in the economic and managerial literature. A certain confusion in terminology is also observable. The terms "business model, strategy, business concept, revenue model, and economic model are often used interchangeably" (Morris *et al.*, 2005, p. 726) although they refer to different concepts. Despite this confusion in terminology, the following common traits can be observed and can help clarify what a BM is and what its purpose is.

First, the literature agrees on the importance of the internal logic of BMs. Indeed, most research supports the conceptualisation of a BM as a system of coordinated activities

intended to translate a business idea into economic value in a coherent, systematic fashion (Zott and Amit, 2010). Accordingly, Chesbrough and Rosenbloom (2002, p. 529) define a BM as "the heuristic logic that connects technical potential with the realisation of economic value". Teece (2010, p. 179) also emphasises the importance of internal consistency, arguing that "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".

Second, most scholars concur that BMs directly affect performance, contributing to ensuring firms' long-term competitiveness. Thus, the BM is "the way an organisation operates to ensure its sustainability" (Demil and Lecocq, 2010, p. 23). Morris *et al.* (2005, p. 727) stress this linkage by defining the BM as a "concise representation of how an interrelated set of decision variables [...] are addressed to create sustainable competitive advantage in defined markets".

Third, studies support that the BM extends beyond the boundaries of the organisation and concerns the "system and the governance of transactions designed so as to create value through the exploitation of business opportunities" (Amit and Zott, 2001, p. 511). By coupling the BM with open innovation, firms can embrace open BMs to increase their contact with other organisations (Chesbrough, 2006). In general, the field of open innovation offers new perspectives for exploring the dynamics and the interlinkages between firms' external stakeholders and the evolution of BMs (Bogers *et al.*, 2016).

There is less agreement regarding the temporal aspect of business modelling activity. Part of the literature relies on a configurational approach, which treats the BM as a bundle (configuration) of components (building blocks) that co-determine firm performance (i.e. Osterwalder and Pigneur, 2010). Other strands of literature, though, prefer to view the BM as a more dynamic entity, focussing on the activities of adapting, innovating and improving the BM to find an equilibrium between the external environment and the model dynamics (Demil and Lecocq, 2010). Advancing this argument, Bourreau *et al.* (2012) contend that radical innovations, such as digitalisation, may lead firms to rapidly adopt new, innovative BMs, a phenomenon called the big bang of BMs, rather than iteratively adjusting their models. Supporters of the dynamic approach argue that firms must adapt their BMs to market changes to ensure their competitiveness (Chesbrough and Rosenbloom, 2002; Chesbrough, 2010; Sosna *et al.*, 2010). Critics of this approach highlight the objective difficulties of continuously reconfiguring BMs. For example, Zott and Amit (2010, p. 217) argue that "once the template is set, the activities are in place, and the resources have been developed and honed, that template will be difficult to change, due to forces of inertia and resistance to change".

In recent studies, some scholars challenge the presumption that BMs must have coherence. Indeed, authors suggest that the simultaneous adoption of different BMs (and conflicting design themes) can pay off for firms. Studying a sample of 40 British firms, Mason and Mouzas (2012) find that firms adopt variable, flexible BM configurations. In particular, firms select and integrate various configurations of the internal elements of their BMs to respond to changing market conditions (Mason and Mouzas, 2012). Benson-Rea *et al.* (2013) reach similar conclusions in their investigation of seven New Zealand wine firms and conclude that firms can manage multiple concurrent BMs depending on the strategies they pursue.

Focusing on the interdependencies within BM constructs in a qualitative comparative analysis, Kulins *et al.* (2016) find that when efficiency and innovation value drivers appear jointly in a BM, their interaction can be a driver for success. However, simultaneously implementing of these two design themes can be rather difficult. The authors argue that "novelty may be the antecedent for finding new ways to bring in design themes such as efficiency to appropriate more of the resulting value" (Kulins *et al.*, 2016, p. 1439).

All the cited studies provide interesting hints that ambidexterity is achievable, to some extent, when designing and managing firms' BMs. Further, these studies inject some

dynamism into the configurational approach by showing that firms can incorporate the seeds of BM innovation in a stable configuration. However, additional empirical evidence, especially of quantitative type, is urgently needed to determine whether this concept of BM ambidexterity is merely academic speculation and whether the adoption of different BM configurations can lead to superior firm performance. In particular, under which specific internal and external (to the firm) conditions the adoption of an ambidextrous BM can pay out need to be better understood. This research considers one specific external condition (firm location) and investigates the phenomenon of BM ambidexterity in a sample of firms based in a country characterised by poor market institutions and low economic development, low-innovation performance and low openness to foreign markets.

*The relationship between BM design and firm performance*
In their efforts to define a typology of BMs, Zott and Amit (2007) distinguish two opposing design themes: efficiency-centred and novelty-centred. Regarding novelty-centred BMs, the authors state that the degree of a BM's novelty is not necessarily linked to the level of technology embedded in the products or the production processes (Zott and Amit, 2007). As the same authors state in a later contribution, "the essence of novelty-centred activity system design is the adoption of new activities (content), and/or new ways of linking the activities (structure), and/or new ways of governing the activities (governance)" (Amit and Zott, 2010, p. 221). The novelty of BMs is also unrelated to market dynamics, indicating that it is not only high-tech and information-technology firms that need to design novel BMs, but, rather, that elements of business model novelty (BMN) can be found almost in every sector (von Tunzelmann and Acha, 2006).

Firms design innovative BMs to achieve superior performance (Hamel, 2000; Christensen, 2001). Ideally, a novel BM is difficult to imitate and provides sustainable competitive advantages (Teece, 2010). Empirical research on this theme is growing quickly, partly because start-ups, venture capitalists and policy makers are all struggling to understand whether certain BMs or specific characteristics can increase the survival chances and the financial performances of newly established firms. Of course, no single best way can be identified, and even the most celebrated and globally innovative firms experience failure, as discussed in Christensen *et al.* (2016).

Zott and Amit (2007) argue that novel BM designs lead to higher performance even amid resource scarcity or uncertainty. The empirical findings supporting their argument highlight that environmental advantages do not moderate the BM-performance relationship, confirming the "temporal stability of this relationship" (Zott and Amit, 2007, p. 195). Patzelt *et al.* (2008) find that management experience can have either positive or negative effects on the performance of biotech ventures, depending on the BM adopted. In particular, management experience has positive effects on firms adopting platform-based (novel for the industry) BMs. Brettel *et al.* (2012) argue that novelty-centred BMs achieve superior performance in any stage of a firm's lifecycle. Based on these arguments and evidence, the first hypothesis is advanced:

*H1.* A positive relationship exists between BMN and firm performance.

Rather than adding new features to BM designs, some organisations prefer to explore more efficient ways to carry out their business. Efficiency-centred BM designs are aimed at reducing transaction costs though governance structures and mechanisms that mitigate uncertainty and transaction complexity (Zott and Amit, 2007). The argumentation is based on Williamson's (1975) theory of transaction costs which includes various kinds of costs, such as search, contracting, negotiating, monitoring and enforcement costs (Dyer, 1996). When designing a BM, lower transaction costs "can derive from the attenuation of uncertainty, complexity, or information asymmetry, as well as from reduced coordination costs and

transaction risk" (Zott and Amit, 2008, p. 4). By reducing transaction costs, organisations increase their efficiency and, all other conditions being equal, their profitability.

Brettel *et al.* (2012) support the hypothesis that efficiency-centred BM designs improve governance efficiency and firm performance, especially in the later lifecycle stages. Zott and Amit (2007), however, report mixed results: in periods of resource scarcity (e.g. after the high-tech crash of 2000), entrepreneurial firms adopting efficient designs perform better, but in periods of abundant resources (e.g. before the high-tech crash of 2000), the hypothesised positive effect of business model efficiency (BME) on performance is not significant. Hu and Chen (2016) find strong support for the impact of efficiency-centred designs on the technological innovation performance of firms in the context of an emerging economy (China). Thus, based on the results reported above, the second hypothesis is proposed:

*H2.* A positive relationship exists between BME and firm performance.

Hamel (2000) first argues that efficiency and not or uniqueness determines the profit potential of a BM. To describe a BM's capacity to successfully pursue conflicting goals, scholars adopt the concept of ambidexterity from the organisational literature. The underlying reasoning is as follows: if ambidexterity corresponds to the ability to simultaneously manage and pursue exploration- and exploitation-oriented goals through appropriate capabilities (Tushman and O'Reilly, 1996; Benner and Tushman, 2003), then efficient BM designs help companies achieve their exploitation-oriented goals. Efficient BMs increase efficiency by "refining and expanding existing knowledge and capabilities to improve and optimise the existing content, structure, and governance of transactions" (Hu and Chen, 2016, p. 586). In contrast, novel designs support an organisation's exploration-oriented goals by "emphasis[ing] the adoption of new means of transactions by focusing on discovering and pursuing new knowledge and capabilities that support the development of new content, structures, and governance of transactions" (Hu and Chen, 2016, p. 586).

In an extensive review of exploration and exploitation capabilities, Lavie *et al.* (2010) find that only a few studies demonstrate positive outcomes from balancing opposite models and invite researchers to fill this gap with coherent empirical research. Zott and Amit (2007) offer two possible lines of reasoning in this regard. On one hand, they argue that by adopting novelty-centred BM designs, firms can also establish new governing activities which, in turn, can result in new transaction mechanisms, including those focussed on improving efficiency and adaptation capabilities (Zott and Amit, 2007). Thus, firms can structure their BMs by increasing the levels of novelty and efficiency in a complementary way as "their interaction [can] have positive effect on performance" (Zott and Amit, 2007, p. 186). On the other hand, the authors caution that attempting to achieve both efficiency and novelty might lead to "suboptimal resource allocation" and, consequently, poor performance (Zott and Amit, 2007, p. 186). These findings suggest that, at least in entrepreneurial firms, attempts to design BMs that emphasise both efficiency and novelty can adversely affect performance.

Some studies in the international business literature highlight that exporters who simultaneously target sensitive and affluent market segments through spatially separated BMs can perform well in the context of emerging markets (Lewis, 2000; Sanchez and Ricart, 2010; Ernst *et al.*, 2015; Winterhalter *et al.*, 2016). However, spatial separation is merely one possible form of BM ambidexterity (Markides, 2013). In a longitudinal study involving a firm operating in the telecommunications industry, Khanagha *et al.* (2014) find that spatial separation of BMs is not the best solution for firms that must manage their current business while experimenting with novel and potentially disruptive BMs. In such circumstances, contextual ambidexterity or the concurrent and synergistic management of conflicting BMs, seems to be a better option (see also Jansen *et al.*, 2006; Lin *et al.*, 2007).

The BM literature identifies the simultaneous management of novel and efficient design themes as a form of contextual ambidexterity. Empirical evidence on the theme has been

scarce, but it is now growing. For example, Hu and Chen (2016), who analyse the ambidexterity-performance relationship in a sample of 173 manufacturing firms, show that the simultaneous pursuit of efficiency and novelty positively affects Chinese firms' technological innovation performance.

Hu and Chen (2016) takes the position that the transactional efficiency of BMs does not necessarily come at the expense of the degree of novelty. On the contrary, novel designs may serve as an antecedent for finding innovative ways to introduce and combine new design themes, such as efficiency, ultimately improving firm performance (Kulins *et al.*, 2016). It is thus hypothesised that BME moderates the relationship between BMN and firm performance:

*H3.* BME positively moderates the relationship between BMN and performance.

## Methodology and methods
### Research context and sample characteristics
The study is based in Albania, a developing country in Europe, in which agriculture remains important (making up 20 per cent of the gross domestic product (GDP)) and the manufacturing sector is relatively small (21 per cent of GDP) (INSTAT (Albanian Institute of Statistics), 2016). The small amount of foreign direct investment that Albania attracts is concentrated in the low-technology sector, reducing the innovation transfer potential from more developed countries (United Nations Education, Scientific and Cultural Organization (UNESCO), 2015). Albania's lack of exposure to the global economy contributes to its continued GDP growth, even since the 2008 global financial crisis (Eurostat, 2016).

The Albanian business environment is increasingly dynamic, and business regulations and enforcement have become more supportive of enterprises. However, the country is only moderately prepared to develop a functioning market economy due to challenges, including the informal economy, inefficient contract enforcement, uncertain property rights and widespread corruption. The country's lowest scoring indicators related to the institutional framework are regulations, judicial independence, intellectual property protection, property rights and the efficiency of legal framework in settling disputes (World Economic Forum, 2016). Government and private-sector investment in research and development (R&D) is quite low. Albania is classified as a low-innovation country where few companies invest in buying or producing knowledge (European Bank for Reconstruction and Development, 2014). Despite slight increases in economic competitiveness and some progress in business sophistication and innovation in recent years, Albania remains an "efficiency-driven economy" (World Economic Forum, 2016). A series of national strategies to enhance innovation has been proposed, including grants for product and process innovation for small and medium-sized enterprises, but measures targeted at business innovation and technological development are still lacking or underfunded (for instance, the 2011-2016 budget for the business innovation and technology strategy is only €4.8 million) (UNESCO, 2015).

The sample in the present study consists of 107 firms randomly selected from an initial data set of 870 which were generated during a survey on innovation firms conducted by the Albanian Institute of Statistics (INSTAT). A random sample of 440 firms (out of 870) was initially selected and was stratified by industry (50 per cent manufacturing firms and 50 per cent service firms) and size (15 per cent micro firms, 35 per cent small firms and 50 per cent medium-sized firms). The sample proportion has been adjusted to yield a desired level of accuracy related to the representation of medium-sized and large firms (Kish, 1965). Indeed, the population of Albanian firms, based on the number of employed individuals, is as follows: 41.6 per cent are micro firms (one to nine employees), 19.5 are small firms (10-49 employees), 20.2 per cent are medium firms (50-249 employees) and 18.7 per cent are large firms (250+ employees) (INSTAT (Albanian Institute of Statistics), 2017).

In any case, it is not easy for us to understand to what extend our sample could be considered more or less representative of the entire population of Albanian firms because of a general lack of information and data from official sources. For example, despite using some metrics imported from the Community Innovation Survey (CIS) in our research, we have no evidence of what happens in the entire population, since the CIS has never being performed in Albania so far. Something similar can be said for turnover data for which we lack complete and reliable data on the entire population. Hence, companies were stratified by size using the number of employees.

As previously mentioned, the final sample includes 107 (out of 440) companies, representing a response rate of 24.3 per cent. Despite the low response rate, our sample is representative of the initial one composed by 440 firms. Descriptive statistics for the sample are summarised in Table I.

In an effort to identify potential non-response bias and lacking data from non-respondents, we studied potential variations within the existing data set (Groves, 2006; Groves and Wissoker, 1999). Following Miller and Smith's (1983) argument that late responders are similar to non-respondents, we divided the data set into two sub-groups based on response waves (early and late reply) also taking into consideration the number of contacts we had had with respondents. The Levene's test for our normally distributed data (the significance value of the Shapiro-Wilk test is greater than 0.05) verified the equality of variances in the samples ($p > 0.05$ for all variables included in our model) (Martin and Bridgmon, 2012).

Our sampling has some limitations that caution against generalising the findings. The over-representation of certain groups (medium-large firms), the lack of or incomplete available data from official sources, the low response rate and the heterogeneity of firms in our sample introduces some bias into our analysis.

| | % |
|---|---|
| *Sector* | |
| Manufacturing (and mining) | 57.0 |
| Services | 43.0 |
| | |
| *Size of firm* | |
| Micro/small | 52.0 |
| Medium/large | 48.0 |
| | |
| *Number of employees* | |
| 1-9 employees | 9.6 |
| 10-49 employees | 42.4 |
| 50-249 employees | 35.5 |
| More than 250 employees | 12.5 |
| | |
| *Age of firm* | |
| Less than 10 years old | 43.0 |
| 11-20 years | 51.4 |
| Over 20 years | 5.6 |
| | |
| *Innovation descriptors* | |
| The firm introduced new or significantly improved goods or services into the market in the last 3 years | 50.5 |
| The firm introduced new or significantly improved methods of manufacturing or producing goods or services in the last 3 years | 58.5 |
| The firm introduced new or significantly improved logistics, delivery or distribution methods for the inputs, goods or services in the last 3 years | 52.9 |
| The firm introduced new or significantly improved supporting activities for the processes, such as maintenance systems or operations for purchasing, accounting, or computing in the last 3 years | 58.3 |

**Table I.**
Characteristics of
sampled firms

## Instrument and data collection

All the companies were first contacted by telephone. The aim of the study was explained, and we requested that the firm's CEO or an experienced manager answer the questionnaire. Responses were preferably collected through face-to-face interviews. An online questionnaire was used with firms difficult to reach directly, and the link to complete the survey was sent directly to the identified contact persons. The data collection team consisted of ten people who received specific training and written guidelines on how to conduct the interviews and how to address survey items.

## Common method variance

Data were collected from one informant per firm, so appropriate techniques to control for common method bias were used (Podsakoff *et al.*, 2003). A cover letter informed the respondents that their answers would be kept anonymous and used only for research purposes. The questionnaire was pre-tested with experts and managers to avoid including ambiguous or unfamiliar concepts. Additionally, to control for common method variance, Harman's single-factor test was conducted. The total variance for one factor is approximately 35 per cent, significantly less than the threshold of 50 per cent; therefore, common method variance is not a serious risk in the study.

## Measures

*BMN and BME (independent)*. These qualities are measured by adapting the scales used by Zott and Amit (2007). The reliability of the items for novelty-centred BM design (seven items) and efficiency-centred business model design (eight items) is assessed. The standardised Cronbach's $\alpha$ coefficients of 0.888 and 0.847, respectively, met the recommended criteria (Nunnally, 1978).

*Business performance (dependent)*. This measure is assessed by the average ratings of five items: market share, revenue, profit, cash flow and cost reduction. The measure is the results of the combination of two different metrics (Auh and Merlo, 2012; Slater and Olson, 2000) that have been integrated with the addition of the item "cost reduction". The respondents are asked to rate their business performance compared to that of their most direct competitor for the past three years (Auh and Merlo, 2012). The five-item construct has a Cronbach's $\alpha$ of 0.834. The research design also includes control variables.

*Market competition (control)*. Researchers widely recognise the impact of the level of competition on business performance (e.g. Porter, 1980). A competitive environment reduces the resources available for innovation and increases the pressure to achieve higher efficiency and reduce prices, leading to tighter margins (Zahra, 1996). Market competition is assessed with a single item on managers' and entrepreneurs' perceptions of whether the level of market domination by established enterprises prevents firms from innovating.

*Size (control)*. Following Penrose (1995), size is traditionally adopted as a proxy for a firm's resource endowment. However, in their work on BM design, Zott and Amit (2007) view size as a proxy for a firm's' bargaining power, which can influence a firm's ability to achieve superior financial performance regardless of the business model design theme. In line with this operationalisation, this study measures size as a natural logarithm of the number of employees.

*Age (control)*. Following Zott and Amit (2007) and Brettel *et al.* (2012), we controlled for the effect of firm's age on its performance. In line with the operationalisation of Brettel *et al.* (2012), this study measures age as a natural logarithm of years since foundation.

*Industry (control)*. Considering the heterogeneity of firms in our sample and based on Brettel *et al.* (2012), we controlled for industry using a dichotomous variable – manufacturing and mining vs services.

Further details of the constructs adopted and the operationalisation of the variables are provided in Table AI.

*Model estimation*
The data are analysed using multivariate regression. Following previous studies (e.g. Brettel *et al.*, 2012; Zott and Amit, 2007) and the approach specified by Sharma *et al.* (1981), the nature of the moderating variable is investigated using the following equations:

$$Y = \beta_{10} + \beta_{11}C_1 + \beta_{12}C_2 + \beta_{13}C_3 + \beta_{14}C_4 + e_1 \tag{1}$$

$$Y = \beta_{20} + \beta_{21}C_1 + \beta_{22}C_2 + \beta_{23}C_3 + \beta_{24}C_4 + \beta_{23}X + e_2 \tag{2}$$

$$Y = \beta_{30} + \beta_{31}C_1 + \beta_{32}C_2 + \beta_{33}C_3 + \beta_{34}C_4 + \beta_{33}X + \beta_{34}Z + e_3 \tag{3}$$

$$Y = \beta_{40} + \beta_{41}C_1 + \beta_{42}C_2 + \beta_{43}C_3 + \beta_{44}C_4 + \beta_{43}X + \beta_{44}Z + \beta_{45}XZ + e_4 \tag{4}$$

where $Y$ is the dependent variable representing firm performance, $X$ is the independent variable (novelty-centred BM design), $Z$ is the other independent variable and potential moderating variable (efficiency-centred BM design), $XZ$ is the interaction term between efficiency- and novelty-centred design, $C_1$, $C_2$, $C_3$ and $C_4$ are the four control variables (market competition, size, age and industry). Following Sharma *et al.* (1981), $Z$ can be considered to be a pure moderator if Equations (2) and (3) are equal but different than Equation (4). $Z$ is considered to be a quasi-moderator if $\beta_{43} \neq \beta_{44} \neq 0$. In this analysis, this variable is both a predictor and a moderator.

*Construct validity of the two business themes*
Factor analysis (promax rotation) is performed to test the validity of the independent variables (see Table AII) as, following Tabachnick and Fiddell's (2007) guidelines, the two business model design themes have a significant correlation (0.473). If correlations exceed 0.32, then there is enough variance to warrant oblique rotation (Tabachnick and Fiddell, 2007).

The results for novelty design load reasonably high (0.854, 0.772, 0.549, 0.763, 0.900, 0.643 and 0.773). For efficiency design, all eight factors also load high (0.697, 0.674, 0.641, 0.592, 0.737, 0.614, 0.811 and 0.812). The loadings exceed the acceptable standards of 0.4 (Hinkin, 1995) and 0.32 (Tabachnick and Fiddell, 2007). The validity tests indicate that the measures are acceptable for the hypotheses test.

**Results**
Table II shows the correlations among the variables. As mentioned, the coefficients for the correlations between the two independent variables (design efficiency and design novelty) are significant and strong. In addition, respectively, age and size, and BMN and industry are

| Variables | BMN | BME | BMN × BME | Size (Ln) | Market competition | Age (Ln) | Industry |
|---|---|---|---|---|---|---|---|
| BMN | 1.000 | | | | | | |
| BME | 0.473*** | 1.000 | | | | | |
| BMN × BME | 0.001 | −0.174 | 1.000 | | | | |
| Size (Ln) | 0.164 | 0.015 | −0.101 | 1.000 | | | |
| Market competition | −0.097 | −0.115 | 0.030 | −0.156 | 1.000 | | |
| Age (Ln) | −0.080 | −0.020 | −0.064 | 0.244* | −0.058 | 1.000 | |
| Industry | 0.223* | −0.021 | 0.141 | −0.105 | −0.109 | −0.083 | 1.000 |
| **Notes:** *$0.01 \leqslant p < 0.05$; **$p < 0.01$; ***$p < 0.001$; ****$0.05 \leqslant p < 0.1$ | | | | | | | |

Table II.
Correlations among variables in the model

moderately correlated. However, no multicollinearity-related issues are found as the statistics show that the variance inflation factor levels are acceptable (values are around 1).

Table III presents the results of the regression models. Model 1 includes only control variables, while Model 2 adds the first independent variable (novelty-centred design). Model 3 includes both independent terms (novelty and efficiency), and finally, Model 4 also introduces the interaction term. The empirical results show a significant, positive link between novelty-centred design themes and a firm's performance, supporting the first research hypothesis. Quite surprisingly, the second research hypothesis has no empirical support, leading to the conclusion that, at least among the sampled firms, the adoption of efficiency-centred BM design has no significant impact on a firm's performance.

However, the interaction term between the two design themes has a significant relationship with the dependent variable (performance), supporting the third hypothesis. In particular, these results confirm that an efficiency-centred business model design acts as a pure moderator, strengthening the positive relationship between novelty-centred BM design and firm performance. The full Model 4 explains 29.8 per cent of the variation in the dependent variable.

Finally, size and market competition control variables have a significant relationship to the dependent variable, whereas age and industry are not significantly linked to performance.

Following Aiken and West (1991), the interaction effect is plotted (Figure 1) and shows that the adoption of novelty-centred business model design leads to better performance at higher levels of efficiency but has the opposite effect at lower levels of efficiency. The firms that report high levels of transaction efficiency have the steepest slopes, while the firms that report low levels of transaction efficiency have the flattest slopes. However, the change in $R^2$ from Model 3 (which does not include the interaction term) to Model 4 is not very steep, suggesting that some caution should be exercised in interpreting the role played by BM ambidexterity.

## Discussion
### Theoretical contribution and research implications
The business model literature questions whether different BM configurations lead to varied firm performance (i.e. Zott and Amit, 2007; Patzelt *et al.*, 2008; Brettel *et al.*, 2012; Hu and Chen, 2016; Pucci *et al.*, 2017). This study, based in a developing economy, adds to this discussion by highlighting the positive role played by a novelty-centred BM and, at the same time, the limited contribution of efficiency-centred designs.

The results obtained seem counterintuitive. One might assume that to succeed in domestic and international markets, firms based in emerging countries should focusing on

| | Model 1 Value (SE) | Dependent variable: performance Model 2 Value (SE) | Model 3 Value (SE) | Model 4 Value (SE) |
|---|---|---|---|---|
| Constant | 4.946 | 5.118*** | 5.079*** | 4.937*** |
| Size (Ln) | 0.219** | 0.153* | 0.160* | 0.174* |
| Market competition | −0.258* | −0.239* | −0.232* | −0.235* |
| Age (Ln) | −0.216**** | −0.158 | −0.161 | −0.153 |
| Industry | −0.021 | −0.213 | −0.190 | −0.235 |
| BMN | n/a | 0.287***(0.069) | 0.260** (0.081) | 0.246**(0.081) |
| BME | n/a | n/a | 0.069 (0.102) | 0.111 (0.104) |
| BMN × BME | n/a | n/a | n/a | 0.122* (0.058) |
| $R^2$ | 0.162 | 0.310 | 0.316 | 0.344 |
| Adjusted $R^2$ | 0.129 | 0.276 | 0.275 | 0.298 |
| F | 4.932** | 9.095*** | 7.686*** | 7.414*** |

**Notes:** $*0.01 \leqslant p < 0.05$; $**p < 0.01$; $***p < 0.001$; $****0.05 \leqslant p < 0.1$
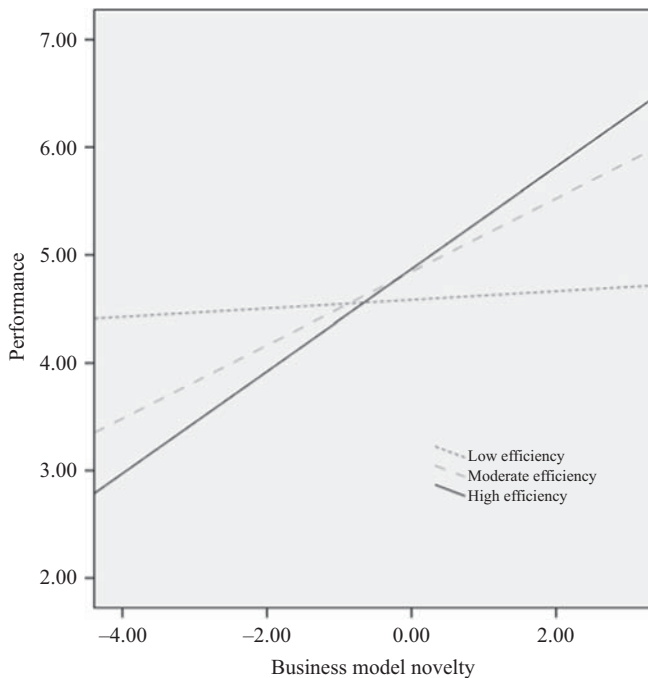
Figure 1.
Moderating effect of
business model
efficiency on the
relationship between
business model
novelty and
performance

leveraging cost advantages, as novelty-centred designs have less impact on performance. Too much novelty can also be counterproductive as local consumers might be less sensitive to novel features and regard price as the determining factor in purchase decisions. On the contrary, the results, which are in line with those obtained in more developed economies, (i.e. Zott and Amit, 2007; Patzelt *et al.*, 2008; Hu, 2014) indicate that novelty matters. Thus, this study extends the validity of previous findings in the specific context of a (post-transition) developing economy (Albania).

Moreover, in our study we were unable to support the hypothesis that an efficiency-centred BM design has a significant positive effect on the performance of the firm. This result is not completely aligned with the previous literature that usually highlights a strong positive role exerted by BME (i.e. Brettel *et al.*, 2012; Hu, 2014). One possible explanation is that for firms based in developing markets – already benefiting from lower labour costs – investing in BME is less relevant than bridging the novelty gap for competing, especially at the international level (see also Uhlenbruck *et al.*, 2003 at this regard). The greatest part of Albania's international commercial trade occurs with Italy, Greece and Austria, which are three highly developed manufacturing countries. As a result, Albanian firms may find their way to the market through leveraging on novel elements of their BMs. Unfortunately, we do not have data related to the internationalisation level of the surveyed firms that could help confirm or disconfirm this hypothesis.

The results of our study also expand the knowledge on BM ambidexterity. In particular, the results support the hypothesis that simultaneous management of two different design themes can have a positive effect on performance. By doing so, we provide support for Zott and Amit's (2007, p. 186) claim that BMN and BME "can be complementary and their interaction could have positive effect on performance" and that no diseconomies of scope are created from the simultaneous adoption of opposing design themes. When contextualised,

this result tells us that, despite not needing to rely on highly efficient BMs to obtain good performance, Albanian firms who are also able to add efficiency to their novel BMs outperform those direct competitors who are unable to do the same.

Some managerial implications can be derived from our study. Quite frequently, firms based in developing countries bear the conventional stereotype of copycat innovators (Ernst *et al.*, 2015), producing less-costly versions of technologically advanced products originating from hi-tech countries (Agnihotri, 2015). Today, however, an increasing number of firms based in emerging and developing countries expand quickly internationally by offering innovative products which find acceptance by sophisticated consumers in more advanced economies (Belderbos *et al.*, 2013). For such firms, investing in BMN is crucial initially, yet could be a necessary but insufficient condition to sustain long-term growth. Scaling up internationally also requires more than novelty. Streamlining production processes and distribution systems becomes necessary when businesses expand internationally. In general, scaling up requires rigour, regardless of where companies are based.

Entrepreneurs and managers, therefore, should focus on enhancing the value proposition to customers in a difficult-to-imitate fashion (see Teece, 2010). Later, as argued by Brettel *et al.* (2012), firms adopting novel BM designs can also increase transaction efficiency (their value-capture capability) by improving exchange relationships with key customers and suppliers, which does not weaken existing BMs but, instead, improves their performance.

The results also have implications for policy makers. For nearly 50 years (1948-1992), Albanian firms experienced limited international openness and little stimuli for innovation. The results of the present study suggests that developing novel BMs could have beneficial outcomes for Albanian firms, helping them expand internationally and reducing the innovation gap with competitors based in more developed countries.

*Limitations and research development*
No study comes without limitations. However, we believe the limitations of our study offer valuable starting points for future research. First, although the sample is randomly selected, it focusses on firms displaying some features of innovation, limiting the generalisability of the findings to broader business populations. Over-representation of some sectors and the group of medium- and large-size firms, and the low response rate introduces some potential sample bias. Additionally, the study does not control for other design themes, such as lock-in-centred and complementary-centred design (see Amit and Zott, 2001). Future research should include a broader sample of firms and BM themes to capture all the value-creation potential and the performance implications.

Second, the present study does not analyse certain contingency factors at the firm and the industry levels that might affect the BM-firm performance relationship, such as investment in R&D, advertising and marketing (see Zott and Amit, 2007). Third, the findings on the moderating effect of efficiency-centred BM design in the relationship between firm performance and novelty-centred BM design can be attributed to complementarities between this specific theme and product market strategies (see Zott and Amit, 2008) or multiple BM designs (see Mason and Mouzas, 2012; Benson-Rea *et al.*, 2013). Future research should include firm, environment and strategy control variables to ensure that the captured effect can be attributed only to the BM design and not to specific product market strategies, environmental and competitive dynamics or potential pluralism in the BM design. Finally, this research adopts a static approach to investigate firm performance and BM design themes. It would be of interest to conduct longitudinal studies to test the evolution and the performance implications of BM design themes under dynamic circumstances.

Additionally, considering the boundary-spanning nature of BMs (Zott and Amit, 2010), the findings point to the interesting future research topics exploring the relationships

between business models and the networks in which firms are embedded. Many network scholars argue that novel governance structures can be characterised by both novelty and efficiency (e.g. Nohria and Eccles, 1992). Certain governance processes and structures, such as strategic alliances (see Dyer and Singh, 1998), can reduce transaction costs and create additional value (Geyskens *et al.*, 2006). From a theoretical perspective, understanding the growing role of efficiency in the novel BM designs of mature firms can shed light on BM reliability, its evolution and the factors influencing it (e.g. type of network). From an entrepreneurial perspective, it would be interesting to explore what kinds of governance structures and firm architecture allow the achievement of more efficient transactions in novel BM designs. Accordingly, future research should extend the analysis to other relevant constructs from network, bargain and transaction-cost theory.

## Conclusions

The aim of our study was to deepen the complex relationship between BM design, BM ambidexterity and performance of the firm through an analysis of a sample of 107 firms based in Albania, a post-communist developing country. Our study responds to various calls in the BM literature to advance existing knowledge on complementarities and synergies between different business model designs. Furthermore, the study context provides a novel research arena to investigate the consequences of the adoption of different BM designs by firms.

Our results are partly in line with the previous literature but despite confirming the positive role exerted by BMN, we were unable to provide empirical support to the role of BME. These findings are noteworthy. From an entrepreneurial standpoint, novelty design as source of wealth creation presents great opportunities even in an efficiency-driven economy. Contrary to our expectations, BME has no significant direct effect on the performance of the firm. However, we found BME to exert and indirect effect, positively moderating the relationship between BMN and performance, thus supporting an ambidexterity hypothesis. Thus, the two different BM designs can mutually reinforce each other. This finding has a potentially significant implication for entrepreneurship research and practitioners. Firms adopting BMN, can not only introduce efficiency elements in their BM design without hampering BM configuration but can outperform those adopting novelty design only. Thus, becoming ambidextrous can be viewed as a potential form of BM innovation.

## References

Afuah, A. and Tucci, C.L. (2001), *Internet Business Models and Strategies: Text and Cases*, Irwin McGraw-Hill, New York, NY.

Agnihotri, A. (2015), "Low-cost innovation in emerging markets", *Journal of Strategic Marketing*, Vol. 23 No. 5, pp. 399-411.

Aiken, L. and West, S.G. (1991), *Multiple Regression: Testing and Interpreting Interactions*, Sage, London.

Amit, R. and Zott, C. (2001), "Value creation in e-business", *Strategic Management Journal*, Vol. 22 Nos 6-7, pp. 493-520.

Aspara, J., Hietanen, J. and Tikkanen, H. (2010), "Business model innovation vs replication: financial performance implications of strategic emphases", *Journal of Strategic Marketing*, Vol. 18 No. 1, pp. 39-56.

Auh, S. and Merlo, O. (2012), "The power of marketing within the firm: its contribution to business performance and the effect of power asymmetry", *Industrial Marketing Management*, Vol. 41 No. 5, pp. 861-873.

Belderbos, R., Leten, B. and Suzuki, S. (2013), "How global is R&D? Firm-level determinants of home-country bias in R&D", *Journal of International Business Studies*, Vol. 44 No. 8, pp. 765-786.

Benner, M.J. and Tushman, M.L. (2003), "Exploitation, exploration, and process management: the productivity dilemma revisited", *Academy of Management Review*, Vol. 28 No. 2, pp. 238-256.

Benson-Rea, M., Brodie, J.R. and Sima, H. (2013), "The plurality of co-existing business models: investigating the complexity of value drivers", *Industrial Marketing Management*, Vol. 42 No. 5, pp. 717-729.

Bogers, M., Zobel, A.K., Afuah, A., Almirall, E., Brunswicker, S., Dahlander, L., Frederiksen, L., Gawer, A., Gruber, M., Haefliger, S., Hagedoorn, J., Hilgers, D., Laursen, K., Magnusson, M.G., Majchrzak, A., McCarthy, I.P., Moeslein, K.M., Nambisan, S., Piller, F.T., Radziwon, A., Rossi-Lamastra, C., Sims, J. and Ter Wal, A.L.J. (2016), "The open innovation research landscape: established perspectives and emerging themes across different levels of analysis", *Industry and Innovation*, Vol. 24 No. 1, pp. 8-40.

Bourreau, M., Gensollen, M. and Moreau, F. (2012), "The impact of a radical innovation on business models: incremental adjustments or big bang?", *Industry and Innovation*, Vol. 19 No. 5, pp. 415-435.

Brettel, M., Strese, S. and Flatten, C.T. (2012), "Improving the performance of business models with relationship marketing efforts – an entrepreneurial perspective", *European Management Journal*, Vol. 30 No. 2, pp. 85-98.

Casadesus-Masanell, R. and Ricart, J.E. (2011), "How to design a winning business model", *Harvard Business Review*, January-February, pp. 1-9.

Chesbrough, H. (2006), "Why companies should have open business models", *MIT Sloan Management Review*, Vol. 48 No. 2, pp. 1-10.

Chesbrough, H. (2010), "Business model innovation: opportunities and barriers", *Long Range Planning*, Vol. 43 Nos 2-3, pp. 354-363.

Chesbrough, H.W. and Rosenbloom, R.S. (2002), "The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spinoff companies", *Industrial and Corporate Change*, Vol. 11 No. 3, pp. 533-534.

Christensen, C.M. (2001), "The past and future of competitive advantage", *MIT Sloan Management Review*, Vol. 42 No. 2, pp. 105-109.

Christensen, C.M., Bartman, T. and Van Bever, D. (2016), "The hard truth about business model innovation", *MIT Sloan Management Review*, Vol. 58 No. 1, pp. 31-45.

Demil, B. and Lecocq, X. (2010), "Business model evolution: in search of dynamic consistency", *Long Range Planning*, Vol. 43 Nos 2/3, pp. 227-246.

Dyer, J. and Singh, H. (1998), "The relational view: cooperative strategy and sources of inter-organizational competitive advantage", *Academy of Management Review*, Vol. 23 No. 4, pp. 660-679.

Dyer, J.H. (1996), "How Chrysler created an American Keiretsu", *Harvard Business Review*, Vol. 74 July-August, pp. 42-56.

Ernst, H., Kahle, H.N., Dubiel, A., Prabhu, J. and Subramaniam, M. (2015), "The antecedents and consequences of affordable value innovations for emerging markets", *Journal of Product Innovation Management*, Vol. 32 No. 1, pp. 65-79.

European Bank for Reconstruction and Development (2014), "Transition report", London, p. 17.

Eurostat (2016), "Enlargement countries – statistical overview", available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Enlargement_countries_-_statistical_overview (accessed 4 January 2017).

Foss, N.J. and Saebi, T. (2017), "Fifteen years of research on business model innovation", *Journal of Management*, Vol. 43 No. 1, pp. 200-227, available at: http://doi.org/10.1177/0149206316675927

Geyskens, I., Steenkamp, J.-B.E.M. and Kumar, N. (2006), "Make, buy, or ally: a transaction cost theory meta-analysis", *Academy of Management Journal*, Vol. 49 No. 3, pp. 519-543.

Groves, R.M. (2006), "Nonresponse rates and nonresponse bias in household surveys", *Public Opinion Quarterly*, Vol. 70 No. 5, pp. 646-675.

Groves, R. and Wissoker, D. (1999), "Early nonresponse studies of the 1997 National Survey of America's families", Assessing the New Federalism Report No. 7, Urban Institute, Washington, DC.

Hamel, G. (2000), *Leading the Revolution*, Harvard Business School Press, Boston, MA.

Hinkin, T.R. (1995), "A review of scale development practices in the study of organizations", *Journal of Management*, Vol. 21 No. 5, pp. 967-988.

Hu, B. (2014), "Linking business models with technological innovation performance through organizational learning", *European Management Journal*, Vol. 32 No. 4, pp. 587-595.

Hu, B. and Chen, W. (2016), "Business model ambidexterity and technological innovation performance: evidence from China", *Technology Analysis & Strategic Management*, Vol. 28 No. 5, pp. 583-600.

INSTAT (Albanian Institute of Statistics) (2016), "Annual national accounts", available at: www.instat. gov.al/al/themes/llogarit%C3%AB-kombetare.aspx?tab=tabs-5 (accessed 4 January 2017).

INSTAT (Albanian Institute of Statistics) (2017), "Statistics on small and medium enterprises, 2015", available at: http://instat.gov.al/media/379211/results_on_sme_from_sbs_2015.pdf (accessed 6 October 2017).

Jansen, J.P.J., Van Den Bosch, A.J.F. and Volberda, W.H. (2006), "Exploratory innovation, exploitative innovation, and performance: effects of organizational antecedents and environmental moderators", *Management Science*, Vol. 52 No. 11, pp. 1661-1674.

Khanagha, S., Volberda, H. and Oshri, I. (2014), "Business model renewal and ambidexterity: structural alteration and strategy formation process during transition to a cloud business model", *R&D Management*, Vol. 44 No. 3, pp. 322-340.

Khanna, T., Palepu, K.G. and Sinha, J. (2005), "Strategies that fit emerging markets", *Harvard Business Review*, Vol. 83 No. 6, pp. 63-76.

Kish, L. (1965), *Survey Sampling*, John Wiley and Sons, Inc., New York, NY.

Kulins, C., Leonardy, H. and Weber, C. (2016), "A configurational approach in business model design", *Journal of Business Research*, Vol. 69 No. 4, pp. 1437-1441.

Lavie, D., Stettner, U. and Tushman, M.L. (2010), "Exploration and exploitation within and across organizations", *The Academy of Management Annals*, Vol. 4 No. 1, pp. 109-155.

Lewis, W.M. (2000), "Exploring paradox: toward a more comprehensive guide", *Academy of Management Review*, Vol. 25 No. 4, pp. 760-776.

Lin, J.Zh., Yang, H. and Demirkan, I. (2007), "Empirical investigation and computational theorizing", *Management Science*, Vol. 53 No. 10, pp. 1645-1658.

Markides, C. (2013), "Business model innovation: what can the ambidexterity literature teach us?", *The Academy of Management Perspectives*, Vol. 27 No. 4, pp. 313-323.

Martin, W.E. and Bridgmon, K.D. (2012), *Quantitative and Statistical Research Methods. From Hypothesis to Results*, Wiley, Somerset, NJ.

Mason, K. and Mouzas, S. (2012), "Flexible business models", *European Journal of Marketing*, Vol. 46 No. 10, pp. 1340-1367.

Massa, L., Tucci, C.L. and Afuah, A. (2017), "A critical assessment of business model research", *Academy of Management Annals 2017*, Vol. 11 No. 1, pp. 73-104.

Miller, K.L. and Smith, L.E. (1983), "Handling nonresponse issues", *Journal of Extension*, Vol. 21 No. 5, pp. 45-50.

Morris, M., Schindehutte, M. and Allen, J. (2005), "The entrepreneur's business model: toward a unified perspective", *Journal of Business Research*, Vol. 58 No. 6, pp. 726-735.

Nohria, N. and Eccles, R.G. (1992), *Networks and Organizations*, Harvard Business School Press, Boston, MA.

Nunnally, J.C. (1978), *Psychometric Theory*, 2nd ed., McGraw-Hill, New York, NY.

Osterwalder, A. and Pigneur, Y. (2010), *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*, John Wiley & Sons, Hoboken, NJ.

Patzelt, H., Knyphausen-Aufseb, D. and Nikol, P. (2008), "Top management teams, business models, and performance of biotechnology ventures: an upper echelon perspective", *British Journal of Management*, Vol. 19 No. 3, pp. 205-221.

Penrose, E. (1995), *The Theory of the Growth of the Firm*, 3rd ed., Oxford University Press, Oxford.

Podsakoff, M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, pp. 879-903.

Porter, M. (1980), *Competitive Strategy*, Free Press, New York, NY.

Pucci, T., Nosi, C. and Zanni, L. (2017), "Firm capabilities, business model design and performance of SMEs", *Journal of Small Business and Enterprise Development*, Vol. 24 No. 2, pp. 222-241.

Sanchez, P. and Ricart, J.E. (2010), "Business model innovation and sources of value creation in low-income markets", *European Management Review*, Vol. 7 No. 3, pp. 138-154.

Schneider, S. and Spieth, P. (2013), "Business model innovation: towards an integrated future research agenda", *International Journal of Innovation Management*, Vol. 17 No. 1, pp. 1-34, available at: http://doi.org/10.1142/S136391961340001X

Sharma, S., Durand, R.M. and Gur-Arie, O. (1981), "Identification and analysis of moderator variables", *Journal of Marketing Research*, Vol. 18 No. 3, pp. 291-300.

Slater, S.F. and Olson, E.M. (2000), "Strategy type and performance. The influence of sales force management", *Strategic Management Journal*, Vol. 21 No. 8, pp. 813-829.

Sosna, M., Trevinyo-Rodrıguez, N.R. and Velamuri, S.R. (2010), "Business model innovation through trial-and-error learning – the Naturhouse case", *Long Range Planning*, Vol. 43 No. 2, pp. 383-407.

Tabachnick, B.G. and Fidell., L.S. (2007), *Using Multivariate Statistics*, 5th ed., Pearson Allyn & Bacon, Upper Saddle River, NJ.

Teece, D.J. (2010), "Business models, business strategy and innovation", *Long Range Planning*, Vol. 43 Nos 2/3, pp. 172-194.

Tushman, M.L. and O'Reilly, C. (1996), "Ambidextrous organizations: managing evolutionary and revolutionary change", *California Management Review*, Vol. 38 No. 4, pp. 8-30.

Uhlenbruck, K., Meyer, K.E. and Hitt, M. (2003), "Organizational transformation in transition economies: resource-based and organizational learning perspectives", *Journal of Management Studies*, Vol. 40 No. 2, pp. 257-282.

United Nations Education, Scientific and Cultural Organization (UNESCO) (2015), "Science report: towards 2030", Paris, p. 284.

Von Tunzelmann, N. and Acha, V. (2006), "Innovation in 'low-tech' industries", in Fagerberg, J. and Mowery., D.C. (Eds), *The Oxford Handbook of Innovation*, Oxford University Press, Oxford, pp. 407-432.

Williamson, O.E. (1975), *Markets and Hierarchies*, The Free Press, New York, NY.

Winterhalter, S., Zeschky, M. and Gassmann, O. (2016), "Managing dual business models in emerging markets: an ambidexterity perspective", *R&D Management*, Vol. 46 No. 3, pp. 464-479.

Wirtz, B.W., Pistoia, A., Ullrich, S. and Göttel, V. (2016), "Business models: origin, development and future research perspectives", *Long Range Planning*, Vol. 49 No. 1, pp. 36-54, available at: http://doi.org/10.1016/j.lrp.2015.04.001

World Bank (2017), *Doing Business 2017: Equal Opportunity for All*, World Bank, Washington, DC.

World Economic Forum (2016), "Global Competitive Report 2016-2017", World Economic Forum, Geneva.

Zahra, S.A. (1996), "Technology strategy and financial performance: examining the moderating role of the firm's competitive environment", *Journal of Business Venturing*, Vol. 11 No. 3, pp. 189-219.

Zott, C. and Amit, R. (2007), "Business model design and the performance of entrepreneurial firms", *Organization Science*, Vol. 18 No. 2, pp. 181-199.

Zott, C. and Amit, R. (2008), "The fit between product market strategy and business model: implications for firm performance", *Strategic Management Journal*, Vol. 29, pp. 1-26.

Zott, C. and Amit, R. (2010), "Business model design: an activity system perspective", *Long Range Planning*, Vol. 43 No. 2, pp. 216-226.

**Further reading**

Khanna, T., Gulati, R. and Nohria, N. (1998), "The dynamics of learning alliances: competition, cooperation, and relative scope", *Strategic Management Journal*, Vol. 19 No. 3, pp. 193-210.

Kogut, B. (2000), "The network as knowledge: generative rules and the emergence of structure", *Strategic Management Journal*, Vol. 21 No. 3, pp. 405-425.

(The Appendix follows overleaf.)

| Construct and concept | Operationalisation | Number of items | Measurement |
|---|---|---|---|
| *Dependent variable* | | | |
| Performance | (1) Market share compared to the most direct competitor<br>(2) Revenue compared to the most direct competitor<br>(3) Profit compared to the most direct competitor<br>(4) Cash flow compared to the most direct competitor<br>(5) Decreased costs compared to the most direct competitor | 5 | 7-point scale (1 = much worse, 4 = equal, 7 = much better) |
| *Independent variables* | | | |
| Novelty-centred business model design | (1) Our business model offers new combinations of products, services and information<br>(2) Our business model gives access to a broad variety and number of participants and/or goods and services<br>(3) The richness (i.e. quality and depth) of some enabled links between participants is novel<br>(4) In our industry, we are a pioneer in the exploitation of our business<br>(5) We have continuously introduced innovations to make our business more effective<br>(6) There are no competing businesses in our industry that threaten ours<br>(7) Our overall business model is novel | 7 | 7-point scale (1 = totally disagree, 7 = totally agree) |
| Efficiency-centred business model design | (1) Transactions with our firm are simple from the customer or user's point of view<br>(2) Our business model enables a low number of errors in the execution of transactions<br>(3) Costs for participants in our business are reduced (i.e. marketing and sales costs, transaction-processing costs, communication costs)<br>(4) Our business model can handle small as well as large transaction volumes<br>(5) Our business model enables participants to make informed decisions<br>(6) Our business model brings benefits through demand aggregation (e.g. bundling smaller volumes)<br>(7) Our business model enables fast execution of transactions<br>(8) Our overall business model offers high transaction efficiency | 8 | 7-point scale (1 = totally disagree, 7 = totally agree) |

**Table AI.**
Survey items and measurement

| Construct and concept | Operationalisation | Number of items | Measurement | |
|---|---|---|---|---|
| *Control variables* | | | | |
| Size | Number of employees | 1 | Natural logarithm of the number of employees | |
| Market competition/ concentration | Market dominated by established enterprises prevents the firm from innovating or hampers its innovation activities. | 1 | 4-point scale (0 = factor not experienced, 1 = low, 2 = medium, 3 = high) | |
| Age | Number of years since foundation | 1 | Natural logarithm of number of years | |
| Industry | Manufacturing and mining vs services | 1 | Dichotomous (0-services, 1-manifacturing and mining | **Table AI.** |

## Appendix II

| Items of the two constructs | Factor[a] F1 | F2 | |
|---|---|---|---|
| Our business model offers new combinations of products, services and information | *0.854* | −0.209 | |
| Our business model gives access to a broad variety and number of participants and/or goods and services | *0.772* | −0.029 | |
| The richness (i.e. quality and depth) of some enabled links between participants is novel | *0.549* | 0.283 | |
| In our industry, we are a pioneer in the exploitation of our business | *0.763* | 0.084 | |
| We have continuously introduced innovations to make our business more effective | *0.900* | −0.105 | |
| There are no competing businesses in our industry that threaten ours | *0.643* | 0.014 | |
| Our overall business model is novel | *0.773* | 0.015 | |
| Transactions with our firm are simple from the customer or user's point of view | −0.087 | *0.697* | |
| Our business model enables a low number of errors in the execution of transactions | −0.300 | *0.674* | |
| Costs for participants in our business are reduced (i.e. marketing and sales costs, transaction-processing costs, communication costs) | −0.119 | *0.641* | |
| Our business model can handle small as well as large transaction volumes | 0.105 | *0.592* | |
| Our business model enables participants to make informed decisions | 0.148 | *0.737* | |
| Our business model brings benefits through demand aggregation (e.g. bundling smaller volumes) | 0.161 | *0.614* | |
| Our business model enables fast execution of transactions | 0.062 | *0.811* | |
| Our overall business model offers high transaction efficiency | 0.051 | *0.812* | |
| Percentage variance explained | 41.014 | 15.035 | |

**Notes:** Numbers in italic indicate items with higher factor loadings. [a]Underlying dimensions in two factors: F1, novelty-centred design, F2, efficiency-centred design

**Table AII.**
Factor analysis

**Corresponding author**
Guido Bortoluzzi can be contacted at: guido.bortoluzzi@deams.units.it