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Business Models for Frugal Innovation in Emerging Markets: The Case of the Medical Device and Laboratory Equipment Industry

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A B S T R A C T

This study investigates business models for frugal innovation (i.e. a specific form of resource-constrained innovation) in the medical device and laboratory equipment industry in the context of emerging markets. Based on original data from five case studies, we investigate how firms can set up value creation and value capturing mechanisms to reach new customer segments in remote rural areas with unprecedented value propositions. With this research, we contribute to the literature on frugal innovation and business models in emerging markets. It is among the first empirical studies to apply a fine-grained perspective on resource-constrained innovation in emerging markets. In doing so, we focus on its most disruptive form, which is when these innovations entail entirely new applications. We advance and detail the value proposition for frugal innovation in these industries and argue that frugal innovation create new markets. Further, we show how firms set up their value creation and value capturing mechanisms to achieve the value proposition and identify two distinct Research & Development (R & D) strategies for frugal innovation.

1. Introduction

The economic growth of emerging markets has significantly influenced the global business landscape. With average growth rates far above Western markets, emerging economies and particularly the BRIICS countries (Brazil, Russia, India, Indonesia, China and South Africa) constitute strategic growth markets (Drummond, 2012; OECD, 2009). Within emerging markets, the so-called middle and low-end market segments represent one of the fastest growing customer segments globally (Kravets and Sandikci, 2014; George et al., 2016). In order to compete successfully in these market segments, firms need to provide customers with “resource-constrained” innovations and business models that create high value at very low cost (George et al., 2012; Mudambi, 2011). These innovations enable Western firms to access these unexploited market segments, offering unparalleled growth opportunities (Baskaran and Mehta, 2016). Authors have used different terms for this phenomenon such as *cost innovation* (Williamson, 2010), *good-enough innovation* (Gadiesh et al., 2007; Hart and Christensen, 2002) or *frugal innovation* (Cunha et al., 2014; Zeschky et al., 2014a). Resource-constrained innovations are particularly difficult to achieve for Western firms that are traditionally specialized in advanced innovation for high-tech products and business models (Halme et al., 2012). However, to successfully tap new markets in the middle or low end, especially Western firms need to develop capabilities for resource-constrained innovation and business models (George et al., 2012; Mudambi, 2011; Zeschky et al., 2014a, Winterhalter et al., 2016). Hence, this article investigates how firms can design and establish business models for emerging markets.

Extant research has provided important first insights on how firms can achieve resource-constrained business models and innovations for emerging markets. Particularly literature on the bottom of the pyramid (Prahalad, 2010) has identified ways to address resource-constrained people, which are often located in rural areas with very basic products in industries such as hygiene and health (Ahlstrom, 2010; Anderson and Markides, 2007; Christensen et al., 2015), food and agriculture (Gold et al., 2013; London et al., 2010) or telecommunications (Foster and Heeks, 2013; Seelos and Mair, 2007). These studies particularly highlight the social element of these business models as they not only make goods affordable for the first time to hitherto non-consumers but also how these models foster prosperity in resource-constrained regions and societies (Sinkovics et al., 2014; Wilson and Post, 2013). So far, very little attention has been paid to more sophisticated solutions in the context of emerging markets, which are typically produced by Western companies. However, if Western companies want to successfully compete in resource-constrained markets it is necessary to make their solutions affordable and accessible to the middle and low-end customer segments.

Resource-constrained innovations for emerging markets differ

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drastically from Western products in terms of product novelty and disruptiveness (Wan et al., 2015). Overall, there are very few empirical studies that investigate specific types of resource-constrained innovation and their underlying business models that create them. This is problematic, as firms require varying capabilities to achieve different types of resource-constrained innovations in emerging markets (Zeschkyet al., 2014). Adopting this fine-grained perspective, frugal innovation is the most disruptive type of all resource-constrained innovations as it enables unprecedented applications specifically developed for resource-constrained environments in emerging markets (Wan et al., 2015). To our knowledge, the present article is the first to address these gaps by examining five firms (two Western MNCs and three Indian firms), which successfully implemented business models for frugal innovations in the medical device and laboratory equipment industry. Like many other emerging markets, the healthcare market in India is generally difficult to enter. Additionally it is characterized by a poor infrastructure such as roads, public transport, energy and water supply (Mair et al., 2012). Additionally, people living in rural areas have no knowledge of, access to, or the resources for medical treatment. In India 70% of the entire healthcare infrastructure is confined to the top 20 cities, leaving rural areas heavily under-served (PWC, 2014). This limited access to healthcare has drastic consequences. Roughly twelve million people in India are blind (of a global total of 40–45 million), however 80% of these ailments could have been prevented if screened and treated early enough (Harsimran and Peerzada, 2013). Due to pressing issues like this, emerging countries are in drastic demand of innovations that are able to overcome institutional and infrastructural voids. This article holds several contributions for theory as well as management and policy implications. First, this empirical study, adopting a more fine-grained view of resource-constrained innovation in emerging markets by focusing explicitly on its most radical form (frugal innovations), is the first of this kind. Second, we improve the understanding of the multidimensional value proposition needed for emerging markets and identify the threefold value proposition for frugal innovations in the medical device and laboratory equipment industry. Third, we shed light on how firms can design their business model to achieve a value proposition in the medical device and laboratory equipment industry that fosters frugal innovation. Finally, we identify two specific R & D approaches for frugal business models.

2. Literature review

2.1. Frugal innovation for emerging markets

According to Zeschky et al. (2014b), resource-constrained innovations are low-cost alternatives of existing Western products (i.e. *cost innovations*), re-designed and tailored to be particularly suited for resource-constrained customers in emerging markets (i.e. *good-enough innovations*), or they represent novel products and services that allow new applications specifically developed for customers in resource-constrained contexts (i.e. *frugal innovations*). The phenomenon of resource-constrained innovation in emerging markets is increasingly gaining attention from practitioners and scholars alike. Based on Prahalad's work on the base of the pyramid (Prahalad and Hammond, 2002; Prahalad, 2010) this stream of literature examines how firms can create innovations that provide high value at very low cost for resource-constrained customers. While rather anecdotal reports have provided first insights regarding this topic, rigorous empirical studies are still scarce (Cunha et al., 2014). At the firm level, it was found that emerging market firms make use of these resource-constrained innovations to create a new low-end segment of existing markets (Hang et al., 2015; Lim et al., 2013). A major shortcoming of these studies is that they treated all types of resource-constrained innovations (as explained above) for emerging markets as interchangeable concepts (e.g. Ernst et al., 2015; Hang et al., 2014; Sanchez and Ricart, 2010). However, recent works have shown that these low-cost solutions differ significantly in terms of novelty and target customer segments (Wan et al., 2015).

A well-known example of frugal innovation is M-Pesa, this SMS-based microfinance solution brought banking to the "unbanked" people all over the African continent. The new application here is that people in remote areas get access to financial transaction services by simply sending text messages via GSM – an application non-existent before (Foster and Heeks, 2013). Another example of a frugal innovation is a portable electrocardiograph for rural India developed by General Electric. The application innovation in this example is the portability, which allows for the examinations to be carried out at the home of the patients. Previously, patients had to travel to distant hospitals or medical centers to receive treatment (Govindarajan and Trimble, 2012; Immelt et al., 2009).

2.2. Core elements of business models

Effective business models can be a source of competitive advantage (Markides and Charitou, 2004) and ultimately of overall firm performance (Afuah and Tucci, 2001; Afuah, 2004; Zott and Amit, 2008). They create and capture value for the focal firm and its stakeholders (Chesbrough, 2007; Frankenberger et al., 2013) with the aim of providing a holistic view of the business by combining internal and external factors of a firm (Zott et al., 2011). We adopt the business model definitions provided by Doganova and Eyquem-Renault (2009) and Tongur and Engwall (2014) that consist of the trinity "value creation", "value capturing" and "value proposition". Value creation comprises how a firm creates value and delivers that value to the customer and other stakeholders. This involves the core activities of a firm such as R & D, production and sales (Morris et al., 2005) including processes, capabilities, resources, and channels through which an offering is created and delivered to the customer (Doganova and Eyquem-Renault, 2009). Value capturing refers to the revenue model and defines how a firm appropriates some of the total value created (Amit and Zott, 2001). While some authors consider the revenue model as the firm's gross income (e.g. Johnson et al., 2008), others consider the revenue model as the "bottom line of the business model" as it reflects and integrates the value creation activities into flows of revenues and costs (Doganova and Eyquem-Renault, 2009). Based on the latter perception, we consider value capturing as the reflection of the firm's value creation activities in terms of financial expenses and income. Finally, the value proposition consolidates the embedded value of the firm's offering (Doganova and Eyquem-Renault, 2009) in products or services for the customers.

2.3. Business models in emerging markets

Business models in the context of frugal innovation in emerging markets differ from business models in developed markets (Eyring et al., 2011; George et al., 2012; Landau et al., 2016). This is why many Western firms face the challenge to adapt their existing business models to make them suitable for an emerging market environment (George et al., 2012; Sanchez and Ricart, 2010; Simanis, 2012). Scholars investigating the success factors of business models in emerging markets have found that these business models can be either low-cost replications of established business models for developed markets or entirely new business models, which specifically create value in low-income environments (Sanchez and Ricart, 2010; Chliova and Ringov, 2017). Low-cost replications are often employed to expand market reach, which is mainly achieved by making internal processes more efficient. In contrast, new business models often involve collaborations with external, local partners as these have access to the target market and are already accepted by the local (business) community (London and Hart, 2004; Pitta et al., 2008; Prahalad, 2012). Firms need to create unique business models that are specifically tailored to overcome the challenges and constraints in the emerging market environment (Winterhalter et al., 2016; George et al., 2012). These business models