

**AIDEA 2013 - Track 4.1: New Perspectives On Firm Growth: Between
Traditional And Emerging Issues**

**Resource Constrained Innovation at the Bottom of the Pyramid:
Towards a Theoretical Framework**

Abstract: The traditional concept of innovation involves substantial financial investments, resource usage and existence of supporting institutions. However, in emerging economies that lack such resources and institutions the concept of innovation has to be modified accordingly. Thus, the focus is on understanding how innovation can be pursued with the existence of such constraints. The extant literature on this subject stands divided and fragmented, with no clear theoretical framework that coherently explains the concept of resource constrained innovation. This paper systematically reviews the literature on the existing research work and leverages on two relevant case studies to propose a model of resource constrained innovation in emerging economies.

Keywords: Frugal Innovation, Resource Constrained Innovation, Bottom of the Pyramid, Institutional Voids, Resource Bricolage.

1 Introduction

1.1. The Relevance of Producing for the Bottom of the Pyramid (BoP)

Since its conception, the idea of producing for the bottom of the pyramid (hereafter referred to as BoP) combines the concept of profitability with the idea of social return for local communities (Prahalad & Hammond, 2002; Prahalad & Hart, 2002). The title of Prahalad's most popular book, *Fortune at the Bottom of the Pyramid: Eradicating Poverty through Profits* (2005) discusses this idea in detail. The argument establishes the idea of 'mutual value creation' (London, Anupindi, & Sheth, 2010), combining the two distinct theoretical domains of business strategy and poverty alleviation. The BoP literature is predominantly empirically-driven, based on successful case examples (Hart, 2005) and suggests that economic integration of the BoP can alleviate poverty more effectively than philanthropy (Prahalad, 2010; Prahalad & Ramaswamy, 2004). While doing business at the BoP is challenging, it nonetheless also offers a huge opportunity to expand beyond the saturated markets of Europe and America (Prahalad & Hammond, 2002). The sheer size (Prahalad & Ramaswamy, 2004) of the BoP presents a huge business opportunity to firms (Hammond & Prahalad, 2004). Hart (2005b) argues that official government statistics show only a small part of the whole market in emerging economies and there is an enormous mass of assets without legal acknowledgement (\$ 9.3 trillion worldwide) within the informal economy.

1.2. The Gap in the Literature

The main argument presented in the literature stems from the concept of creating 'mutual value' (London et al., 2010) between the company and the people by providing the latter with economically viable products and services. Additionally, two distinct sub streams of product innovation and business model innovation are extensively discussed. However, little attention is paid to the role of the business environment and other external factors that

can be leveraged to develop affordable products and services. Furthermore, in most studies, organizations are assumed to be monolithic entities with little clarity on how firms should manage key internal resources in a resource constrained environment. Finally, the literature lacks any formal framework that can guide firms to successfully develop products or services targeted at the BoP.

The idea of innovation is intrinsically linked to the notion of BoP as a viable business market segment. The innovation imperative arises due to the very distinct nature of the BoP, characterised by strong socio-economic, institutional and financial constraints. Additionally, it is an extremely heterogeneous and fragmented market, which makes it difficult to organize logistics for procurement and distribution of products. Hence, strategic, product and process innovation becomes necessary in order to develop organizational practices, products and services that correspond to various constraints at the BoP.

While traditional innovation targets the inspirational wants of the affluent customers resulting in complex, expensive products; frugal innovation stems from the idea of satisfying the basic needs of resource constrained customers and hence results in cheaper products that retain the core functionality. To see the BoP as a viable market, firms must therefore unlearn some of the established business notions, and modify capabilities that were developed in the advanced markets and adapt them to match the external challenges at the BoP market. To do this however, the perception of innovation grounded in the idea of excess features and resource intensiveness must transform into an idea of innovation stemming from the idea of doing more with less.

Given the fact that most theories of innovation were developed as a response to the resource intensive innovation programs in Europe and America, they seem less suitable for factoring in the concept of Resource Constrained Innovation (henceforth referred to as RCI) of emerging markets. Also, doing business with the BoP requires extensive learning

experiences and challenging the temporal idea of short-term profit. Olsen and Boxenbaum (2009) propose that the main intra-organizational obstacles to such inclusive business seem to stem from the idea of short-term profit maximization, business unit based incentive structures, and uncertainty avoidance.

1.3. **Research Objective: the Nature of Resource Constrained Innovation at the BoP**

In response to the various constraints that are present in the business environment, the idea of RCI targeting the BoP has evolved into a major strategy for firms in emerging markets. However it has been addressed through various terminologies (for e.g. Frugal Innovation, Cost Innovation and more recently Reverse Innovation,) that are generally narrowly focused. Such fragmentation of literature severely limits the knowledge of RCI in general. Furthermore, the idea has been largely discussed in practitioner-oriented journals and hence there is a need to give it a more theoretically robust grounding.

The differences in markets structure, institutional settings and customer's propensity to consume, makes the RCI process very different to the classical innovation paradigms. Therefore the objective of this study is to contribute to fill the described gap in the literature, providing a more organized and theoretically robust grounding for RCI in emerging markets. In light of the above, in this paper we try to identify the key forces in the external environment and in the firm environment that affect RCI and how are they interconnected.

The rest of the paper is organized as follows. Section two presents the methodology – a systematic literature review (SLR) integrated with two case studies. The SLR divides the relevant articles into three homogeneous groups. Sections three, four and five analyse respectively the subset of articles grouped together and draws propositions. Section six systematizes the resulting propositions into a tentative model and presents a discussion on its implications. The final section draws conclusions and discusses the limitations of the study with a pointer towards future research direction.

2. Methodology

Two different methodological approaches have been combined in this paper: a systematic literature review in a first stage and a multiple case study in a second stage.

2.1. Systematic Literature Review: Data Collection

The paper follows the systematic literature review (SLR) methodology. It analyses the literature and systematizes the available theoretical knowledge about RCI at the BoP. Based on the review, a first tentative model of RCI is developed through a set of propositions. The presence of various loosely defined terms connecting innovation and the BoP literature posed a significant hurdle to conduct the SLR. Given the wide spectrum of associated concepts about RCI and BoP, the initial search was kept broad in order to incorporate the various constructs, definitions and in some cases, models to form a coherent picture.

Thereafter, the study followed the three stage approach (Tranfield, Denyer, & Smart, 2003) of planning, conducting and reviewing the literature. In the initial stage of planning, the domain of research; RCI and BoP, and the main data source, EBSCO were identified.

We consider EBSCO the most comprehensive database in the field and we made reference to it to identify all the potentially relevant articles and their abstracts. We used ABI/Inform or the editors' websites to download the full texts that were not accessible through EBSCO. This choice limits our research to the main academic peer-reviewed journals and prestigious practitioner's journals like MIT Sloan Management review and HBR, so that no books or book chapter were included. We believe that this limitation is justified by the superior rigour and scientific recognition of those journals. This was done to summarize both the theoretical and practical aspects of RCI and to provide a rigorous as well as a relevant study.

During the execution phase of the SLR, the four pronged approach consisting of (a) identification of keywords, selection criteria and downloading of articles, (b) reading the

abstracts to gauge the relevance of the article, (c) downloading the articles that were found interesting after reading the abstracts, (d) reading the downloaded articles in their entirety and then selecting only those that were found relevant for the research was followed.

The keywords along with their limiting criteria are as follows:

<u>Search Strings</u>	<u>Limiting Parameters</u>	<u>No. Of Article</u>	<u>Selected Articles</u>
"Resource Constrained" AND "Innovation"	Only scholarly (peer reviewed) journals	15	7
"Reverse Innovation"	All journals and periodicals	30	17
"Frugal Innovation"	All journals and periodicals	13	11
"Low Cost" AND "Innovation"	Author supplied keywords	7	3
"Inclusive" AND "Innovation"	In Title, All journals and periodicals	13	5
"Inclusive" AND "Innovation"	In Abstract, All journals and periodicals	92	2
Innovation Blowback	All journals and periodicals	2	1
(Bottom OR Base) of Pyramid AND Innovation	All journals and periodicals	34	20
<u>TOTAL</u>		<u>206</u>	<u>66</u>

A total of 206 articles were found out of which 66 were deemed relevant as per the information presented in the abstracts. Articles not related to the business domain, descriptive or that used the idea of BoP symbolically were disqualified. These 66 articles were analysed and 44 of them were found to be relevant for further research. This set of 44 articles formed the basis of the analysis presented in this paper. The articles have been collected in August 2012. The distribution of the journals over time and the journals, which have published the most articles on RCI and BoP, are depicted in figures 1 and 2: they reveal that the attention of scholars and practitioners has been growing from 2002 (when the first article has been

published) till August 2012. The debate is spread in a huge number of journals as just 28 articles on 44 have been published in a journal that includes at least one more relevant article and just one review reached the number of 5 relevant articles.

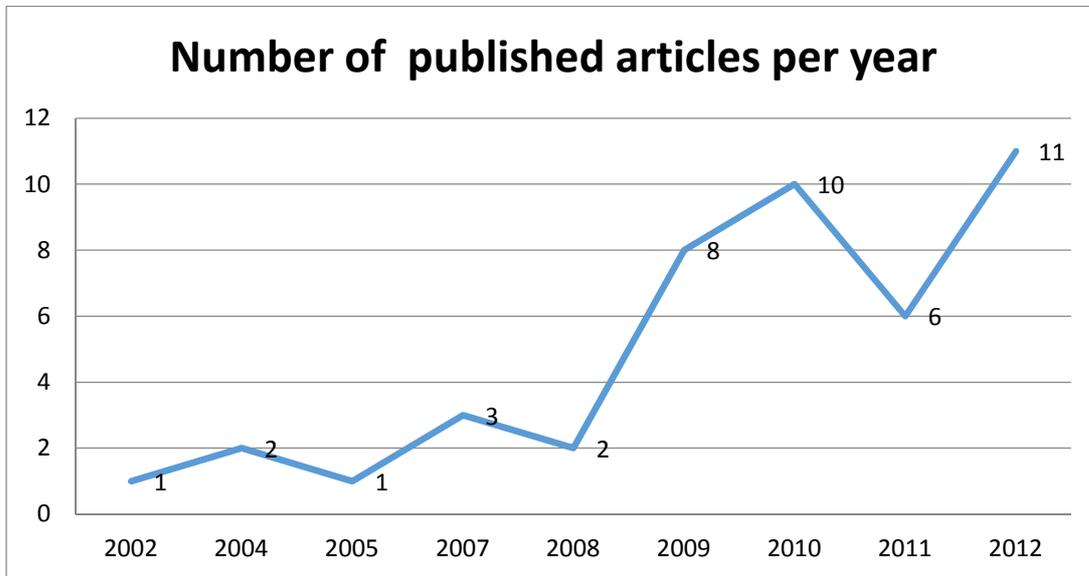


Figure 1: Distribution of published articles over time



Figure 2: Journals with most publication about the topic

2.2. Systematic Literature Review: Data Analysis

Articles have been analysed from September 2012 to December 2012. Two co-authors, independently, have been reading and dividing the articles in sub-themes. The different sub-themes identified by the two co-authors and the allocation of articles or concepts in the sub-themes have been confronted and discussed till a mutual consensus was reached.

Based on the described process, a few sub-themes were identified which divided the articles into groups; each dealing with similar theoretical arguments. The analysis revealed that a majority of the articles on RCI and BoP deal with the firm as the unit of analysis while only a small minority look at external factors like the institutional setting in the market in determining how RCI could be pursued.

The first group consolidates the articles that identify the enabling factors of RCI. Resource scarcity both in the external business environment and firm's internal environment is identified as an important driver of RCI. In response to such lack of resources, an emerging idea of resource bricolage is recognised as an important strategy for product development in emerging economies. Additionally, the importance of cost efficiency within the available resources pool in order to develop affordable products and services is discussed.

The second group of articles deliberates the idea of RCI as a process of developing disruptive innovation, based on Christensen's theory. Discussing various factors that contribute to 'knowledge exploration and exchange', we extend this idea to the BoP. It is proposed that an information exchange mechanism embedded within the business model can drive such knowledge exploration and exchange between the BoP and the firm. Another key factor that forms an important input for pursuing frugal innovation is firm's capability to differentiate between the needs and wants of the BoP customer. While various articles in this group indirectly look at the importance of targeting the needs of the customer as opposed to

the wants, the argument nonetheless is latent and no direct investigation was encountered. However, various ways in which the needs of the customer could be understood have been explored. It has been argued that one of the ways in which this can be achieved is by making the firm boundaries porous, through knowledge exchange mechanisms embedded in the business model and by partnering with external informal and formal institutions or community. These partnerships act as a boundary extension for the firm and encourage the flow of critical knowledge to and from the BoP.

In the third group, the lack or inefficiency of critical institutions is identified as an important factor that influences the process of frugal innovation. This brings out a key difference between the developed market business environment and the emerging market business environment. In most developed markets such institutional infrastructure is established and stabilized and supports formal economic activity within the country. Instead, in developing markets such institutional help is usually unavailable or inefficient; hence making the process of strategy formulation difficult and uncertain.

2.3. Case studies: Data Collection and Data Analysis

While the articles were studied and tentative key ideas developed, two interviews with business leaders involved in RCI at the BoP were conducted in India in November and December 2012. Face to face meetings in the form of semi-structured interviews were conducted by one of us with Mr. Sabaleel Nandy, Head of water business of Tata Chemicals Ltd which developed the worlds cheapest water filter, called Tata Swach, and with Mr. Gopal Sunderraman, Vice President, Godrej and Boyce that developed the ChotuKool; a small refrigerator that works without direct electricity and doesn't have a compressor unlike conventional refrigerators.

Given the busy schedule of the interviewees, one interview each was organized which lasted two hours. Keeping in mind this constraint, a thorough study of the companies and

products was done before hand in order to focus the discussion on key specific topics. The discussion focussed on, but was not limited to the following key ideas.

1. The main challenges they faced in developing a product for the BoP.
2. How were the customer preferences identified? How was the process different from developing products for mainstream customer segments?
3. The key resources that were developed or leveraged during the product development.
4. If any external partnerships were established with local institutions, NGOs or community groups and what were the reason for developing such partnerships.
5. The presence or absence formal and informal institutions and how it affected their company's strategy.

Given the semi-structured form of the interview other aspects of RCI and the BoP were also discussed, as both the interviewees were familiar with the literature on disruptive innovation and BoP. Mr Sunderraman was specifically very well versed with the theory of disruptive innovation and expressed very interesting ideas about how it can be used at the BoP.

In addition to the interviews, other company documentation and business press articles have been used in the drafting of two case studies. All the data were triangulated and two case studies have been drafted.

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In the next four sections the SLR and the two case studies have been combined in order to develop a set of propositions that are able to identify the main features of RCI at the BoP. Finally, based on those propositions, a model of RCI at the BoP, indentifying the links between these propositions and a possible causal chain, is proposed.

3. Facing Resource Constraints - Resource Constrained and Cost

Innovation at the BoP

A clear underlying argument in the literature recognizes the presence of severe resource constraints in most emerging markets as an obstacle for doing business at the BoP. A resource constrained environment can be defined as an '*environment that provides new challenges without providing additional new resources*' (Baker & Nelson, 2005). These resource constraints render the innovation process with its frugality because here innovation has to be pursued with the idea of 'doing more with less' (Prahalad & Mashelkar, 2010).

More specifically, producers serving the bottom of the pyramid face productivity constraints (access raw material, financial, and production resources) and transactional constraints (access to marketplace, missing market power, market security). These can take the form of institutions constraints (Khanna, Palepu, & Sinha, 2005) or can be in the form or severe financial resource constraints that the customer has. In addition to this, strict social and cultural norms also act as deterrents for successful development of affordable products and services.

3.1 Frugal Innovation as an Iterative Process

During the interview with Mr. Sunderraman, vice president Godrej and Boyce, it was revealed that the process of frugal innovation runs in iterations and cycles. Therefore, following a resource constraint approach at each iteration becomes a necessity, in order to prevent the entire process becoming resource intensive. These iterations run between the firm and the consumer before the product is actually commercially launched. For instance, when ChotuKool was developed as a prototype, Godrej organized co-creation events in villages where the product was displayed and its functionality, look and specifications were discussed with 600 women to understand and gauge their response. Based on their recommendations, the product was redesigned and re-released in the market. Since it is extremely difficult to

precisely understand the preferences of the BoP consumer due to the lack of any market research studies or previous experience, the product goes through several iterations before it is deemed fit to be made available in the market. Due to this, investment in each iteration has to be minimal, to avoid resource wastage which could in turn result in the entire process becoming resource intensive and the product expensive.

Similarly in Tata Swach, the team including Mr Nandy toured the villages to understand the true requirements that a water purification device for the rural population should have. Additionally, partnering with Data monitor, Tata conducted surveys to understand the needs and wants of the consumer before developing a prototype. Hence if resource consciousness is not practiced during this part of the development then one can run out of resources or else the end product will become very expensive for the BoP market.

Singh and Chaudhuri (2009) developed a framework for India that classifies frugal innovation in different industries based on company/customers constraints and product/process differentiation. The cement industry, for example, is not in a position to differentiate product significantly but can gain competitive advantage by innovating processes. The main reported examples of frugal innovation in the Indian cement industry are related to new energy saving processes, both in production and transportation.

Slack resources have been showed to play an important part in the process of innovation. While it has been evident that presence of slack resources positively effects the innovation process (Nohria & Gulati, 1996) a spade of low cost innovation emanating from resource constrained environments like India have challenged this view.

Proposition 1 – Resource constraints, natural or artificially induced, positively affect the innovation process targeting the BoP.

3.2 Resource Bricolage

While resource constraints do encourage innovation activity, it is still unclear in what way is innovation carried out. The concept of bricolage has been identified as a key phenomenon within the organization that aids RCI. Resource bricolage has been defined as a process whereby a creative use of available resources is done to derive such value from the resource that was not expected from it originally. The concept of bricolage is practiced widely in visual arts and especially in art of music where various household and other objects are used to make professional music. Examples include the Australian slap bass made from a tea chest or African drums and thumb pianos made from recycle pots and pans. Such use of bricolage is rampant in societies where access to resources is limited due to various historical, social or political reasons and therefore make do with whatever resources are at hand becomes a necessity in day to day life.

Further, a related idea of Entrepreneurial bricolage (Halme et al., 2012) is also discussed in the literature. It is defined as an entrepreneurial activity within an organization characterized by the creative bundling of scarce resources in order to derive the expected value from the bundle.

The concept of bricolage is not new in innovation studies in resource-constrained environments. It has been defined as '*making do by applying combinations of the resources at hand to new problems and opportunities*' (Baker & Nelson, 2005). It has been shown to have a positive effect in the emerging stage of firm creation, on overall innovative outcomes, in the level of product innovation, in sourcing/production innovation, in promotion and market innovation (Senyard & Davidsson, 2011).

Weiss, Hogel and Gibbert (2011) studied the effect of resource constrains on the team climate and concluded that resource constraints encourage bricolage activity within teams and hence increase the innovative activity within it. A similar idea was expressed by Mr

Nandy (Tata Swach). According to him, clever use of existing resources is important and must be parallel to the resource conscious approach when producing for the BoP.

In both, Tata Swach and Godrej ChotuKool, existing resources were identified and creatively bundled to derive the required functionality from them. In Tata Swach, Rice Husk ash, a cheap residue left behind after burning rice husk obtained after the harvesting of rice, was used. Rice Husk can be cheaply produced and is abundantly available in India. Similarly in Godrej ChotuKool, instead of a compressor, a cooling chip, and a fan, similar to that used in laptops was identified and adapted to be used in the product.

Additionally an innovative use of thermoelectric effect and various insulating materials was done for which several patents were granted to Godrej and Boyce. Godrej was able to bring together key resources in terms of technology from two very different industries, cooling and computers, and bundle them to develop a product that stands at the intersection of these two distinct industries. This can be done within the firm by scanning the organization for existing capabilities and resources and leveraging and replicating them in a systematic manner that helps in reducing cost and ‘doing more with less’.

Proposition 2a: Leveraging and developing synergies between existing resources positively effects the development of RCI for the BoP.

Proposition 2b: The ability to develop RCI for the BoP is positively affected by developing a capability to perform Resource Bricolage within the firm such, as using resources originally developed for other purpose.

3.3 RCI Approach vs. Traditional Innovation Approach

Resource constrained product development and its effect on environmentally friendly practices has also been stressed in the literature. Sharma and Iyer (2012) bring out the relation

between resource constrained product development and its implication on green marketing, arguing that while traditional environmentally responsible products are costlier due to their green use and development, the resource constrained approach to product development can actually make green products cost less due to lower resource use when compared with conventional product development approaches (Sharma & Iyer, 2012).

They also bring out the differences in the traditional innovation approach and the resource constrained approach. While in the traditional innovation framework resources are created by a mechanism of dedicated funding, on the opposite RCI comprises of a deliberate resource leveraging and resource adaptation. Moreover, in latter, an innovation is considered radical if the prices are substantially lower while the core functionality remains the same as opposed to the traditional innovation where a radical innovation are always accompanied by a price premium.

Williamson (2010) depicts effectively a global, cost innovation driven, 'value-for-money' revolution that call for a radical re-thinking of business models. Managers look into existing business models' cost structures to seek new ways to do more with less, guided by the principle 'cheaper and better'. They also give a global mandate to emerging markets subsidiaries, look for cost innovating acquisitions in emerging markets and change the mid-set of headquarters staff, becoming learners as well as teachers. The idea that subsidiaries of western firms in emerging countries should have a substantial degree of autonomy, in order to provide frugal innovation, is supported by others (Zeschky, Widenmayer, & Gassmann, 2011) with specific reference to product-portfolio responsibilities.

In fact, when faced with low-cost competitors in emerging markets, companies from developed economies get caught in two traps: a 'denial trap' and an 'innovation trap' (Kachaner, Lindgardt, & Michael, 2011). The denial trap consists of the underestimation of low-cost models developed by rivals. The innovation trap consists of the idea that new

products should always be technically more sophisticated and expensive than previous products. If an incumbent decides to participate in low cost innovation it has to deal with some important dilemmas about the use of the main brand and the organization of the low-cost business model. Experience suggests that a low-cost business model can't be operated within the core business and a secondary brand is often advisable as *'low-cost offerings cannot flourish within a traditional 'high cost' environment'* (Kachaner, Lindgardt and Michael, 2011, p. 47). On similar lines Prahalad and Mashelkar (2010) argue that for most multinationals the idea of innovation is based on assumptions of 'affluence and abundance'. They further identify three kinds of Gandhian innovation which can be achieved in the following ways: 1) disrupting business models to reduce costs; 2) modifying organizational capabilities to make the best of available resource; 3) creating or sourcing new capabilities by leveraging on external capabilities to reduce operational costs.

4. Facing Social Constraints – The Diffusion of Innovation at the BoP

4.1. The Diffusion of Innovation at the BoP

One of the most popular concepts about the diffusion of innovation at the BoP is that of disruptive innovation. According to disruptive innovation strategy (Christensen, 1997, 2005) in any market, there is an upward sloping performance curve and customers expect regular improvements to the existing technology (sustaining innovation). In most competitive situations, those firms over-serve the mainstream market. This opens opportunities to disruptive innovators to slip in underneath the existing competitive arena and solve old problems with solutions that are usually simpler, cheaper, easier to use. Christensen emphasized that such disruptive innovation can be divided broadly into low end innovation and new market innovation (Christensen & Overdorf, 2000). Low end disruptive innovation attack the over served customer, while new market disruptive innovation create new value

propositions and challenge non consumption (Hang, 2010). Initially, such innovations do not look very appealing to the mainstream market. Eventually, however, technology improves and the product becomes appropriate for the lower end of the mainstream market. Initially, incumbents respond by focusing on the high-margin products but as time passes more and more applications are added, with more and more customers buying in the entire mainstream market.

Droegea and Johnson (2010) illustrate the limitations of such a low-end market disruptive innovation strategy (Christensen, 2005) and illustrate how industry structure places intrinsic limitations on the profitability of new entrants pursuing such strategies, when they move towards target markets that are more demanding yet less price sensitive (Droege & Johnson, 2010). Therefore, developing a set of relational capabilities is critical for the successful functioning of the business model in developing markets (London & Hart, 2004).

George et. al. (2012) have introduced a concept of inclusive innovation which they define as *'the development and implementation of new ideas which aspire to create opportunities that embraces social and economy wellbeing for disfranchised members of society'*. They further hint towards a need for constructive confluence of various theoretical perspectives to understand the idea of inclusive innovation better. It makes the case of low cost inclusive innovation very interesting when looked at through the lens of resource based theories.

The process of selling products in developed economies that were originally developed for emerging economies is also called 'reverse innovation'. The opposite of the same is the 'glocalization' approach that many manufacturers based in developed markets have adopted for decades. This process relaxes two assumptions; emerging economies will largely evolve in the same way that rich economies did (in fact, they are jumping ahead, with early adoptions of high-tech solutions, such as wireless technologies, to solve the huge

infrastructural and sustainability problems they face) and that products that are customized for developing countries can't be sold in developed countries because they are not good enough to compete (Immelt & Govindarajan, 2009). Especially in the health-care industry, products developed for emerging markets can be dramatically lower price levels or pioneer new markets and applications. For General Electric, reverse innovation is not just a strategy for growth but a defensive strategy for new players in emerging markets, such as Mindray, Suzlon, Goldwind and Haier: by introducing products that create a new price-performance paradigm they might well overcome General Electric, much more than traditional competitors such as Siemens, Philips and Rolls-Royce (Immelt, Govindarajan and Trimble, 2009).

Rogers (1995, 2003) developed a model to explain the diffusion and adoption of innovation that has proved to be very effective in emerging markets (Gollakota, Pick, & Sathyapriya, 2012). It involves innovation, adopter and a change agent encouraging the adoption. The main attributes of innovations that determine the rate of adoption are identified as, relative advantage, compatibility, complexity, trialability and observability. The diffusion and adoption of innovation are influenced by the type of adoption decision-making (individual or group); the communication channels available to announce, inform and market the innovation; the efforts of the change agent; and the type of social system in which the innovation is being adopted. The theory also deals with the 'tipping point' beyond which an innovation spreads exponentially within the social system and becomes self-sustaining.

4.2. Analyzing the Needs and Wants: Reaching out to the BoP Consumer

Selling products to the BoP involves not only cost reduction but also modifying product characteristics, understanding business environment and social dynamics. All these levers can be applied to improve acceptance (Nakata & Weidner, 2011): products could be made more comprehensible, could be designed for a collective need or use (social dynamics) and employed for atomistic distribution (marketing environment), in a complex approach to

innovation for a ‘differently demanding’ customer. Therefore an intimate knowledge of the social and economic environment of BoP becomes essential. Such knowledge could be acquired through homestays and long interviews, in order ‘*to see, touch, and feel the world from the perspective of the poor [...] to learn about the needs and aspirations of the community by walking in their shoes*’ (Nakata and Weidner, 2012, p. 30). Co-creation of new products with consumers, leveraging on the rich social capital at the BoP, could also increase customization of the product, interest and loyalty. The concept of ‘co-creating value with customers’ (Prahalad and Ramaswamy, 2004) is not new and implies an in-depth and time-consuming dialogue with clients. Direct interaction makes it possible to understand the preferences and expectations of the BoP consumer which differs significantly from the mainstream consumer.

Mr. Sunderraman and Mr. Nandy both observed that the biggest challenge they faced in marketing the product at the BoP was the lack of understanding and usability of the respective products. The magnitude of this challenge could be gauged by the fact that many rural farmers actually questioned the importance of clean drinking water and why should they invest in a water purifier. As a result, direct contact events were organized which served the purpose of marketing as well as educational events that help the consumers realize their own latent needs. This brings out the core challenge of selling to the BoP. In fact, at the initial stage of market development for the BoP, the problem is not competing with other companies but competing with non-consumption.

While most products in the developed economies are a response to the inspirational wants of the relatively well to do customers, in the BoP markets firms must first cater to the immediate needs of the people in an economically viable way. Therefore, understanding and differentiating between the needs of the customers and their inspirational wants is critical. Hence a key element of strategy formulation aimed at the BoP market should stem from a

needs and wants analysis. One of the ways in which this can be done is by building an optimum business model and matching it with the product (or service) development strategy.

Anderson and Billou (2007), based on a 4As framework, argue that if firms want to reach customers at the BoP, they need to focus on four main variables: availability, affordability, acceptability and awareness (Anderson & Billou, 2007). Based on a set of unique product concept and prototype development projects targeted at BoP markets, Viswanathan and Sridharan (2012) identify a set of basic needs of the consumer. These include identification of aspirational needs of consumers; stressing on envisioning product usage situations; serving multiple usage purposes; highlighting on customization at the point of purchase; customizing product for low-literacy users and on local sustainability; understanding and leapfrogging infrastructure limitations; leveraging existing infrastructure where available and incorporating product-related infrastructure. These factors, Viswanathan & Sridharan (2010) argue, are the important points for effective concept and prototype development in BoP when compared to non-BoP markets.

Augmenting the process of consumer research from a one-way information intake (from the market to the firm) by establishing a two way information exchange between the firm and the BoP could help align product characteristic with the target customer preferences.

Consequently, in addition to information gathering, information dissemination becomes important to make the customer understand his or her latent needs. For the BoP market this means being in direct contact with the consumer to understand the consumption habits but also explaining to the non-consumers about the benefits of the product or service which may be obvious to the top of the pyramid customer but translates to luxury at the BoP. Therefore special dedicated efforts must be made develop general awareness. Thus, a constant information exchange between the customer and the company needs to take place in order to develop a product that is affordable enough and offers value that fits well with the

customer's needs. Direct contact with the customer before commercialization is very important.

Proposition 3: In addition to gathering data about the customer, information exchange mechanisms positively affect the firm's ability to develop RCI for the BoP.

4.3. *Establishing External Partnerships*

Ramachandran, Pant and Pani (2012) have introduced the concept of 'bridging enterprise' - a business enterprise that originates at the intersection of specific BoP communities and the corresponding nonlocal markets - as a leading firm that facilitates access to the markets to thousands of producers and other handicraft artisans, through the initiatives of 'Craftmark' and 'Supplier region companies' (SRCs) (Ramachandran, Pant, & Pani, 2012). The Craftmark initiative consists of convening competitors, collaborators, and nongovernmental agencies of a sector to agree on a trademark of authenticity, thereby developing a common differentiating label for products in the retail market. SRCs have come to be known as community-owned enterprises set up in collaboration with artisan communities that would coordinate the operations of artisans and craft workers in a particular geography and involve them as shareholders in the enterprise. The concept of 'bridging enterprise' has proved to be effective in the Indian handloom sector (Ramachandran, Pant & Pani, 2011).

In the Indian resource-constrained environment, three factors have been identified as critical in shaping and managing technology development and diffusion: entrepreneurial leadership and vision; modular designs to meet user demands of affordability, functionality, and operability through architectural innovation; and exploitation of the local knowledge base and the creation of local innovation clusters (Ray & Ray, 2010). The same authors have

studied how Tata set a new industry standard by creating a blue print for a low cost no-frills innovation appropriate to meet the affordability and acceptability criteria at the bottom of the pyramid (Ray & Kanta, 2011). The study analyses the processes of innovation in the design and development of the new car Nano, and in that sense it addresses a gap in the innovation literature which was dedicated primarily on the diffusion of pre-existing products in emerging markets using different business models.

By using the business model as the unit of analysis, Sàncnez and Ricart (2010) explain how business models at the BoP differ from those in developed economies (Sàncnez & Ricart, 2010). Isolated and interactive business models are identified and explored from firms targeting low income customers practice. They argue that firms with isolated business models exhibit an exploitative strategy where the firm leverages its own resources and capabilities for seeking efficiency. Interactive business models are explorative in nature wherein they leverage external resources and capabilities and foster learning and innovation processes (Sàncnez & Ricart, 2010). Hence, such business models are strategized around building partnerships to leverage expertise, for example cultural and consumption habits from outside the firm boundaries. However, partnerships with non-traditional partners can also imply a loss of control over the activities of the value chain. Two main factors are critical for minimizing this risk: the establishment of aligned incentives among the different actors participating in the business model, and the ability of being socially embedded, which allows the firm to acquire substantial learning and generate trust to perform various operational processes more efficiently. In partnering with the poor, BoP producers deal with the market constraints and operate as a bridge linking formal and informal sectors (London and Hart, 2004).

Non-conventional partnerships with community/NGO/institution can help firms build such bridging learning experiences to understand and sometimes make the customer

understand their own latent needs. ChotuKool partnered with the Indian postal service to distribute the product by leveraging its extensive network across rural India. This was in line with Mr. Sunderraman's belief that when offering a drastically different value proposition to a very different market, a matching unique distribution network must be in place. Tata Swatch exhibited similar behaviour in the process of partnering with various NGOs, in order to educate and distribute the product.

Proposition 4: Formation of partnerships with non-conventional institutions/community groups positively affects firm's ability to develop a viable value proposition for the BoP customer.

Chang-Chieh, Jin and Subramian (2010), based on four cases, draw some lessons for multinational companies seeking to enter emerging markets with disruptive BoP innovations: 1) pay attention to the user context, in order to identify local constraints and opportunities; 2) develop local capabilities in order to ensure an acceptable price/performance ratio; 3) be ready for a long-term R&D effort both to maintain the advantage and to move products up and out of the market (Hang, 2010).

5. Facing Institutional Constraints: Identifying and Leveraging Them.

The rules of the game (Gertler, 2010) describe the local institutional setting of an economy which influence the way corporations devise their market strategy. Institution voids describe the absence of intermediaries like market research firms, Internet access, and infrastructure gaps like bad road and rail network. These voids create daunting obstacles for

effective execution of business models in emerging markets. Institutional voids have been argued to present a big challenge to the firm at an operational level. However, they can also be a business opportunity and a driving force to pursue innovation targeting the BoP. Adapting these constraints into business strategy can lead to long-term competitive advantage in emerging markets.

During the discussion with Mr Nandy and Mr Sunderraman it was understood that the role of institutional voids is a complex one. The nature of a particular institutional constraint determines its use and effect on a firm's strategy. According to Mr. Sunderraman, institutional voids, depending on their nature, may or may not be a driver of innovation process. If the nature of the institutional constraint is such that it complements the core competency of the firms, it may actually present a business opportunity to the firm.

However, not all of the institutional voids can be fulfilled by a business initiative. Many institutional voids are often the result of inefficiencies within the business environment and cannot be fulfilled by private firms due to imposed restrictions, such as prohibition on private investment in certain sectors such as railways and roadway infrastructure development. In order to take into account these differences, we propose a fundamental shift from the concept of 'institutional voids' to the one of 'institutional constraints' and classify them as 'absolute institutional constraints' and 'relative institutional constraints'. Absolute institutional constraints are those that are not linked to market opportunities for the private sector, like an inefficient judiciary system or a poor public administration. Private firms cannot furnish such constraints or inefficiencies because they do not offer any business opportunity to them. These are the constraints that need to be thought about before a business model is developed and may act as a driver of operational strategy and business models innovation. For example; how to design an organization that reduces the number of contracts to be enforced, in a country where the judiciary system is not effective?

On the other hand, relative institutional constraints are those that offer business opportunities to private players; like the government's inability to provide clean drinking water, lack of electricity in rural areas and so forth. These are constraints that can actually become an opportunity to innovate and differentiate the products or services from competitors. Much like what ChotuKool, a refrigerator that runs without electricity, and Tata Swach, which doesn't need electricity or running water did.

Proposition 5a: Absolute institutional constraints like poor governance and inefficient public administration act as strategizing hurdles, that need to be leapfrogged, and as drivers of innovative business models to serve the BoP.

Proposition 5b: Relative institutional constraints offer business opportunities that become market opportunities for the private sector and benefit the BoP consumer.

6. Discussion and Proposed Theoretical Framework

Innovation is a path dependant process. That is, it is an outcome of, not only the inputs, but also the way in which the inputs are managed and channelized in a process before the output is obtained. RCI stems from a fundamentally different approach to innovation in that it tries to fold various constraints and transform them into opportunities. It also incorporates the idea of treating existing resources in a different way than the traditional approach. This requires an intimate knowledge of the institutional setting, economic constraints and socio-cultural preferences. Collating the extant literature on RCI and combining it with insights that we got through the two case studies, we propose the following theoretical framework, based on our drafted propositions. It depicts the major factors enabling the firms to develop strategies for pursuing RCI for BoP markets.

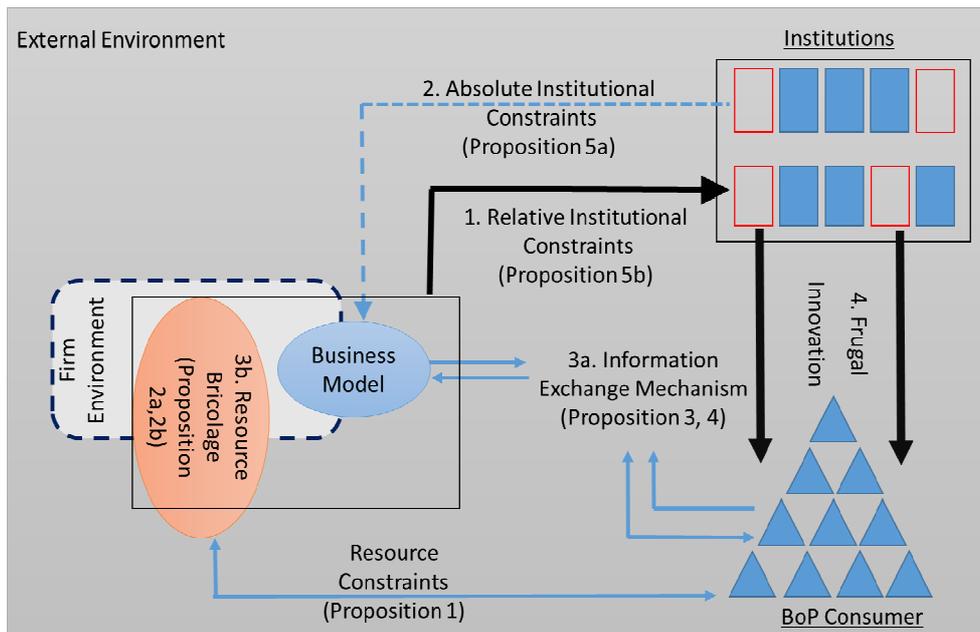


Figure 3: Process flow RCI

The framework presents a process flow check for firms, in order to identify a business opportunity and pursue RCI targeting the BoP. The numbers in the model depicts the different stages of the RCI as a process. The relevant propositions for each stage are reported in brackets.

The first stage is the identification of relative institutional constraints. These constraints offer business opportunities to companies to profit from and at the same time help ease out in these constraints leading to better social and economic wellbeing at the BoP. These relative institutional constraints define the broad value that the firm wants to offer to the BoP customer.

The second stage includes identifying all the absolute institutional constraints that are present in the environment and which directly affect the firm's ability to transform the identified business opportunity into an actual offering. Absolute institutional constraints act as the 'rules of the game' in an emerging market. These constraints are usually government

dependant and take a long time to ease down. Hence firms must take these into account when devising strategies and incorporate them when developing products and business models.

The third stage consists in establishing information exchange mechanisms to gather information about the customer's expected value from the product and simultaneously scan for resources and bundle them to derive the required functionality. The needs of the BoP consumer differs drastically from the present main stream customer at the top of the pyramid. Hence, established notions about a consumer's propensity to spend may not hold true at the the BoP marketplace. Therefore information exchange mechanisms must be developed in order to understand clearly the value that needs to be offerd to the customer. In addition, these mechanisms also act as educational initiatives that bring out the latent needs of non consumers preparing the ground for product commercialization.

Parallel to the information exchange mechanism, practicing systematic resource bricolage helps to make various combinations of acquired resources in order to derive the expected value from the bundeled resources while keeping the costs down¹. Resource bricolage is the process of making do with what is at hand. It incorporates identifying existing resources and within the firm this may actually mean using exiting resources and customizing them to perform a different functionality. It would also mean scanning external markets for such resources. It is a way of innovatively exploiting physical resources, social capital or institutional constraints that were rejected or ignored by other firms.

As a fourth stage, the relative institutional constraints and the information exchange mechanisms that have been put in place between firms and consumers offer firms the opportunity to carve out business models to fill those voids and develop affordable products for the BoP.

¹ The establishment of Information exchange mechanism and Resource Bricolage must take place simultaneously; hence they are labeled as 3a and 3b respectively in the figure.

7. Conclusion

This study is a first attempt towards consolidating the fragmented literature on RCI and BoP in the context of inclusive business development, through a SLR and two case studies.

There exist a unanimous agreement within the literature that the BoP markets are inherently characterised by various economic, social and institutional constraints; and that they act as deterrents to strategy formulation and execution by western firms with a traditional approach.

This study proposes that these constraints must form an integral part of any strategy formulation and may even become a source of competitive advantage for the firm.

Following the assessment, key factors and processes were identified that affect the implementation of RCI as a business strategy to serve the BoP.

Practicing resource bricolage, establishing information exchange mechanism and identifying and leveraging relative institutional constraints were identified as key factors that affect positively the development of RCI at BoP.

In addition to this, a classification of institutional constraints into absolute institutional constraint and relative institutional constrain was proposed in order to bring clarity to the role of institutional constraints in the process of RCI.

Finally, a set of interconnected propositions and a theoretical framework to pursue and explain RCI for the BoP was developed.

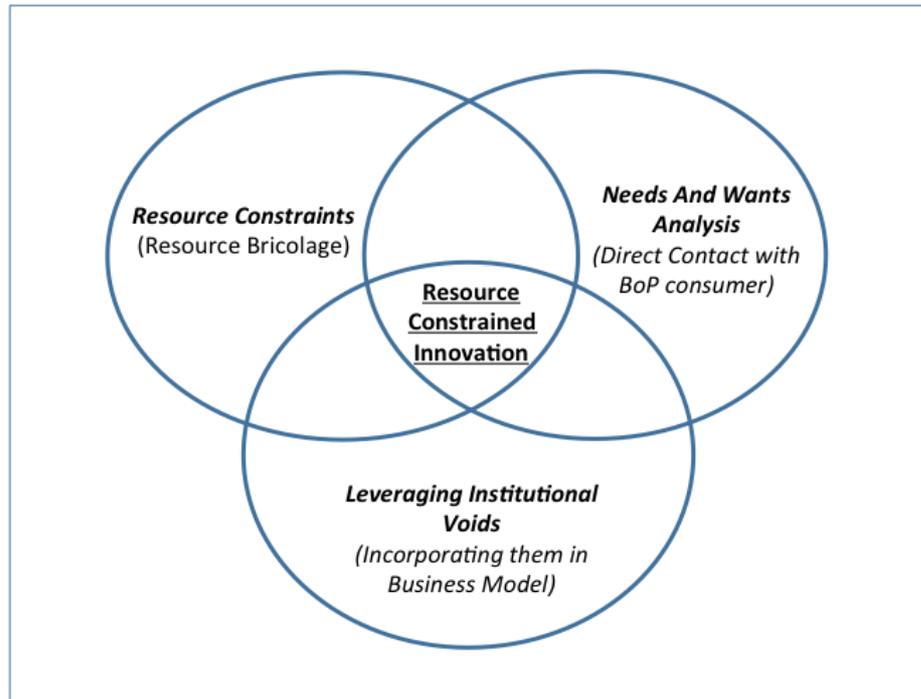


Figure 4: Factors enabling RCI

The study offers a first step towards building a comprehensive theoretical framework about RCI at the BoP. However the main identified factors, namely, resource bricolage, information exchange mechanism and identifying and leveraging institutional constraints, and the integrated framework we propose, need a more comprehensive empirical investigation. Such a study would give additional legitimacy to the propositions presented in this paper and help in refining the model. So, we encourage using those propositions and framework as the lens for future research on RCI at the BoP.

In addition to future empirical investigations, while the role of a firm's internal factors has been studied extensively, the same cannot be said for external factors such as institutional constraints. Due to the importance of institutional constraints, both absolute and relative, to the process of RCI in emerging markets, a more specific theorizing effort is required in that direction.

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