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DISRUPTIVE INNOVATION...IN REVERSE: A
THEORETICAL FRAMEWORK TO LOOK AT NEW
PRODUCT DEVELOPMENT FROM EMERGING
ECONOMIES

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**DISRUPTIVE INNOVATION...IN REVERSE: A THEORETICAL FRAMEWORK TO LOOK AT
NEW PRODUCT DEVELOPMENT FROM EMERGING ECONOMIES**

Simone Corsi, Alberto Di Minin

Abstract

It is now clear that emerging economies are gaining increasing importance in the global innovation system. Their actual role is perhaps the central question driving the growing interest in this topic and to which this paper attempts to respond.

Although several authors have identified and discussed the process of innovation from emerging economies, it remains under-explored. We view the *disruptive innovation* (Christensen, 1997) and *reverse innovation* (Immelt et al, 2009) paradigms side by side: two theories that we think offer interesting and complementary perspectives when we position emerging markets at the centre of the stage as a source of innovation. By analyzing different definitions and descriptions provided by the literature on innovation *for and from* emerging economies, this paper attempts a reinterpretation of the concept of *reverse innovation*, defined as a type of *disruptive innovation*.

Classification JEL: O32, F23, F44, M16

Keywords: Disruptive Innovation, Reverse Innovation, Emerging Economies, Product Development, Cost Innovation, R&D Internationalization

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1. Introduction

What role do emerging economies play in the global innovation system? This paper attempts a reinterpretation of the concept of Reverse Innovation (Immelt et al, 2009), defined as a type of disruptive innovation (Christensen, 1997).

In our literature review, we argue that the combination of these two theories provides a useful framework to look at emerging economies as sources of new products and technological solutions.

It is now clear that emerging economies are gaining increasing importance in the global innovation system. Their actual role is perhaps the central question driving the growing interest in this topic and to which this paper attempts to respond.

Several authors are investigating - on a limited empirical basis for the time being - in what way these countries are not only recipients (Vernon, 1966) but also sources of innovation (Hart and Christensen, 2002; Immelt et al, 2009; Kenney et al, 2009).

Although several authors have identified and discussed the process of innovation from emerging economies, it remains under-explored. Managerial literature is still lacking both a clear and solid theoretical position and a strong theoretical framework within which a new innovation trend from emerging economies can be read and interpreted. Indeed, despite a certain shared view on framing it in the *disruptive innovation* paradigm, there seems to be some confusion and overlap of the concepts that are used to describe such a reverse process of innovation. Scholars refer to this trend in different ways, depending on the aspects they focus on, such as *disruptive innovation from emerging economies*, *innovation at the bottom of the pyramid*, *cost-innovation*, *reverse innovation*.

Hence, the aim of this paper is to critically review the literature concerning innovation from emerging economies and contributing a rationalization of the related concepts. We then view the *disruptive innovation* and *reverse innovation* paradigms side by side: two theories that we think offer interesting and complementary perspectives when we position emerging markets at the centre of the stage as a source of innovation.

A number of fields of study in international business, management and economics have considered the role that BRIC countries (Brazil, Russia, India, China) play in the current global economy configuration. Important studies have been produced sustaining the need for a better understanding of their institutional, environmental and social context. Although beyond the scope of this paper, the areas span intercultural management (Usunier, Lee, 2009; Jacob, 2003), negotiation (Cavusgil et al, 2002; George et al, 1998; Faure, Rubin, 1993), FDI (Frenkel et al, 2004; Meyer, 2004; Tan, Meyer, 2011), outsourcing (Javalgi et al, 2009; Nguyen, Lee, 2008), offshoring (Chakrabarti, Bhaumik, 2010; Engman, 2007), human resource management (Thite et al, 2011; Von Zedtwitz, 2004; Agrawal et al, 2011), monetary economics (Laxton, Pesenti, 2003; Perri, 2004), entry strategy (Cavusgil et al, 2002; Meyer et al, 2009; Demirbag et al, 2008), R&D internationalization (Qu et al, 2007; Li, Kozhikode, 2009; Chakrabarti, Bhaumik, 2010; Von Zedtwitz, 2004), multinational corporations from emerging economies (Chang et al, 2009; Di Minin, Zhang, 2010; Goldstein & , 2009), and so forth.

The lower cost of production factors and the soaring market size of emerging economies have increasingly pushed foreign companies to consider these countries as the main recipients of their investments. At the same time, cultural and institutional differences, as well as environmental and regulatory constraints, have forced foreign companies to adapt their products in order to respond to local requirements and regulations. For several years now, scholars have referred to *glocalization* (the adaptation of global products to local needs) as a way of succeeding in peripheral markets. Developing innovations at the headquarters (HQ) of MNCs in developed economies (Europe, USA and Japan) and then adapting them to some extent to meet local requirements in emerging markets is still the most common way for foreign MNCs to commercialize their products in emerging economies.

In the last ten years, scholars have started to look at companies that serve those markets in a different way. *Glocalization* is in fact assumed to be partially “blind” or ineffective for the purpose of reaching emerging market needs. Innovations generated for developed economies, only partially adapted, and commercialized in emerging markets are able to reach only a small part of the population, the one that has benefited the most from the growing rate of these economies and that is comparable, in terms of power of purchase, to the majority of customers in developed countries. The new challenge of the 21st century has been identified in the profitable development and sale of new products for the mass markets of less affluent populations of emerging economies that are currently not, or only partially, served by MNCs. Innovation management literature has produced a limited number of studies (Hart & Christensen, 2002; Prahalad, 2004; Immelt et al, 2009; Hang et al, 2010), largely based on anecdotal evidence, trying to identify new ways of pursuing innovation in emerging economies. Most of these studies build, more or less implicitly, their argument on the well-known *disruptive innovation* paradigm as defined by Christensen (1997) and Christensen & Raynor (2003). Christensen was one of the first authors to propose a link between *disruptive innovation* and an innovation process that stems from serving developing economies (Hart & Christensen, 2002). *Disruptive innovation* in emerging economies seems to be applied also in Prahalad’s seminal work on innovation for *the bottom of the pyramid* (BOP) (Prahalad, 2004), discussing how to make profit by serving the poorest people in the world with the adoption of revolutionary business models and product/service configurations. This produces benefits for both consumers - who would otherwise not have had access to that type of product and technology - and companies - especially domestic enterprises that gain access to new and large market segments.

Given the specificity of the context for and in which these innovations need to be developed domestic companies seem to be best placed to pursue them. By virtue of their embeddedness, local market knowledge and low cost approach, they develop new product solutions for emerging markets that challenge the activities of foreign MNCs. This phenomenon has mostly been referred to as *cost innovation* (Zeng & Williamson, 2007). Scholars caution foreign MNCs on the risk of being overtaken by these disruptive companies not only in emerging but also in developed economies (Zeng & Williamson, 2007; Seely-Brown & Hamel, 2005). Indeed, growing attention has been paid to companies from emerging economies and how in going global they threaten western MNCs in the home markets that they have dominated for decades. Testing their new products/services, business model solutions and pursuing economies of scales in their local markets, “emerging” companies learn how to innovate and disrupt global competition by leveraging on their high-tech low-cost ability to reach the market (Williamson & Zeng, 2004; Williamson, 2005; Williamson & Zeng, 2008; Williamson, 2010). Responding to this threat is a new challenge for incumbent MNCs and, in our opinion, *disruptive innovation* is in some way useful to describe the new trend that has recently been defined as *reverse innovation* (Immelt et al, 2009). According to Immelt et al (2009), since most current and future global economic growth is likely to take place in emerging economies, innovation specifically aimed at responding to these markets is crucial. In order to do this, subsidiaries in emerging economies have to be granted full decision-making authority in the markets they serve. The success of such a strategy would not only be in anticipating or challenging “emerging” MNCs, but also in granting new growth opportunities to “developed” MNCs in their home markets with technologies and products that would not have been developed without emerging market inputs (Kenney et al, 2009¹). Indeed, new products developed entirely in emerging markets *for* emerging markets are likely to disrupt developed markets and open new

¹ This is the introductory article to the JIBS Special Issue on “Offshoring Administrative and Technical Services”. By discussing the related articles, the authors suggest possible evolutionary patterns for International Business and R&D Management. They identify the role of emerging economies as a potential location to give “...rise to born-global innovations that could never have taken place at home” (p. 8). For a further analysis with a focus on India see Dossani & Kenney (2009).

business opportunities. This phenomenon thus configures a process of innovation that no longer sees developed economies as the locus where new products are conceived, designed and commercialized but instead take on the role of the last recipient of innovations developed *in* and *for* emerging economies.

This paper builds on the *disruptive innovation* literature and contrasts its analysis with the concept of *reverse innovation*. We believe we bring two theoretical contributions:

1. We support the idea that *disruptive innovation* - as defined by Christensen (1997) and intended for advanced economies – needs to be adapted and reinterpreted to be useful in analyzing new business that originates from emerging economies.
2. We suggest that *reverse innovation* - as defined by Immelt et al (2009), and intended to explain a phenomenon originating from emerging countries – fits the definition and is hence a particular manifestation of *disruptive innovation*.

The paper is organized as follows. In the next section, we lay the foundations of our analysis by reviewing Disruptive Innovation Theory. This will be used as our framework to interpret the other sections that take into account disruptive innovation as considered in the different streams of literature related to innovation in emerging economies. Section 3 explores the dynamics of innovation at the Bottom of the Pyramid (BOP), section 4 investigates the conceptualization of disruptive innovation from emerging economies, while section 5 considers cost-driven innovation. Section 6 introduces the dynamics of Reverse Innovation and section 7 interprets this within the Disruptive Innovation framework. Section 8 provides a new categorization of Disruptive Innovation considering a geographical dimension. Finally, conclusions and future research directions are provided in section 9.

2. Disruptive Innovation

Originally, the term *disruptive* was introduced by Bower and Christensen (1995) to indicate a new technology that responds to unserved needs by improving existing technologies on product attributes not valued by mainstream customers.

Christensen refined the concept in 1997 with his “Innovator’s Dilemma”, asking why great companies pursuing innovation in mainstream markets suffer from market myopia and are overtaken by entrant firms introducing products based on new-disruptive technologies.

To explain these phenomena, the author distinguishes between sustaining and disruptive technologies. The former are technologies that respond to an improvement, radical or incremental, of “established products, along the dimensions of performance that mainstream customers in major markets have historically valued” (Christensen, 1997, p. XV). Disruptive technologies instead are innovations for existing products but on attributes that differ from those that are mainly valued by mainstream customers. These innovations, which initially underperform with respect to the main attributes of sustaining technologies, become disruptive when they reach the same performance as the sustaining innovations on the attributes valued by mainstream customers. At this point, they displace existing technologies and cause, in most cases, the failure of incumbent firms. These companies have different options to respond to this type of challenging innovation that include both disruptive and traditional business models, as showed by Charitou & Markides (2003).

In earlier works, Christensen (Bower & Christensen, 1995; Christensen, 1997) refers to disruptive technology only as an “innovation that results in worse product performance in mainstream markets”. It is also described as a “typically cheaper, simpler, smaller and frequently more convenient to use” version of an existing product.

In an updated version of the concept, Christensen and Raynor (2003) distinguish between *low-end disruptions* and (*new-market*) *high-end disruptions*. The former are those offering lower performance at a cheaper price but no other performance improvements, while the latter are described as products and services that offer better performance on attributes that differ from those valued by mainstream customers.

Christensen also asserts that disruptive technologies should be framed as a marketing, and not a technological, challenge. Firms succeeding in disruptive innovations have a strong attitude in interpreting and addressing needs expressed by a market niche or a new market segment. Thus, the challenge that incumbent firms should overcome in developing and responding to disruptive innovations relates to the development of capabilities to forecast market trends and attitudes as well as “riding” new technological trajectories (Suzuki & Kodama, 2004).

The main research question that guided Christensen and other scholars through their research on disruptiveness is “*how can big incumbent firms prevent or face disruptive technologies?*” Therefore, disruptive innovation has been used from the very beginning to discuss innovation dynamics taking place with the entry of new companies in established and developed markets (Chesbrough, 2002). One of the most convincing responses provided by researchers, albeit widely discussed and doubted (Danneels, 2004), is that these companies should promote the creation of spin-off enterprises in order to better serve and interpret emerging markets. The creation of a separate organization of a smaller dimension with large autonomy allows overcoming the problem of resource allocation that is too mainstream-customer oriented. Matching the initially small market size to the size of the investment potentially enables the new company to be profitable (Cefis & Marsili, 2006²).

Since its coinage, the concept of disruptive innovation has been widely discussed from different perspectives (Danneels, 2004; Henderson, 2006). The disruptive innovation paradigm has been analyzed in relation to different industries (Christensen et al, 2000; Gilbert & Bower, 2002; Myers et al, 2002; Pilkington & Dyerson, 2004; Christensen et al, 2006; Sull et al), technological trajectories (Myers et al, 2002), disruptiveness evaluation and predictability (Linton, 2002; Bucher et al, 2003; Husig et al, 2005), firms characteristics for potential disruptiveness (Walsh et al, 2002; Kassicieh et al, 2002), market characteristics (Adner, 2002), financial market influences (Benner, 2007). Christensen himself called for a clarification of disruptive theory (Christensen, 2006).

In particular, Govindarajan and Kopalle (2005; 2006) make a clear distinction between low-end and high-end disruptions based on the level of radicalness of disruptive innovations (technologically more radical in high-end disruptions, technologically less radical in low-end disruptions). The authors also make a clear distinction between innovations that are radical and disruptive and merely radical, stating that radicalness is a technology-based concept while disruptiveness is a market-based concept. Analogously, Markides (2006) draws a clear distinction between different kinds of disruptive innovations: technological, business model and new-to-the-world product innovations. From this distinction and from the work of Utterback (2004), Acee’s (2001), and Utterback & Acee (2005), who recognized the importance of disruptive technologies not in the fact that they displace existing products but in their ability to enlarge existing markets and provide new functionalities, Govindarajan & Kopalle add rigor to an expanded view of disruptive innovation including both high-end and low-end disruptions and defining the concept as follow (2006, p.15):

“A disruptive innovation introduces a different set of features, performance and price attributes relative to the existing product, an unattractive combination for mainstream customers at the time of product introduction because of inferior performance on the attributes these customers value and/or a high price - although a different customer segment may value the new attributes.

² The authors analyze the relationship between innovation and survival probability of manufacturing firms in the Netherlands and they find that the “innovation premium is the highest for small and young firms” (p. 637).

Subsequent developments over time, however, raise the new product's attributes to a level sufficient to satisfy mainstream customers, thus attracting more of the mainstream market".

The most noted example of disruptive innovation provided by Bower & Christensen (1995) and Christensen (1997) refers to the hard disk drive industry between 1976 and 1992. In this market, mainstream customers constantly required improvements in two attributes, total capacity and recording density. The industry and incumbent firms were led by this trend until an emerging segment asked for improvements on different attributes, in particular, the size of drivers. At the beginning, this segment remained marginal and was mainly covered by small entrant firms that could afford to do so by virtue of their relatively limited cost structure, but while the products offered gained improved performance, including the mainstream segment attributes, the market based on sustaining technologies was progressively displaced, causing the failure of incumbents.

In this case, as in the other industry examples provided by Christensen (1997) and Christensen & Raynor (2003), the new segment belongs to the same market where incumbent companies operate. The emergence of new technologies triggers interest within the mainstream segment where these incumbents operate, hence rendering access to the disruptive offering (initially not desired) also possible to mainstream customers.

In conclusion, we can argue that *disruptive innovation* is a theory that seeks to explain changes and new entries in established markets. The result of *disruptive innovation* is visible when mainstream customers switch to the new disruptive product that is gaining market share on established markets.

What if the new disruptive solution has been brought to maturity and has triggered interest in markets that are geographically distant and disconnected from established markets? Disruptive innovation theory was not developed, and is as yet too unrefined, to explain this phenomenon.

3. Innovation at the Bottom of the Pyramid (BOP)

While the disruptive innovation paradigm explores the dynamics originating within the hub of an industry, a new approach was developed to understand what was taking place in emerging economies and their markets. This orientation brought scholars to thinking of emerging economies as focal markets to which companies should pay increasing attention and develop a new R&D orientation (Prahalad & Hart, 2002).

Traditionally, MNCs delocalized their R&D oriented FDI in emerging economies for two main reasons (Gassman & Han, 2004; Von Zedtwitz, 2004):

- Access to local markets
- Access to high-skilled research personnel at a lower cost

Following these two drivers, most R&D carried out by foreign MNCs in emerging countries consisted in the adaptation of global products to the specific needs of the local market. R&D, crucial for the development of new products, has traditionally been undisclosed by headquarters (Patel & Pavitt, 1991; Di Minin & Bianchi, forthcoming), and this is particularly true of R&D internationalization in emerging economies.

The new perspective in the early 2000s was that emerging market potential was not exploited with the previous approach and that a new type of innovation management had to be developed. According to emerging studies in this period, two main motivations lay behind the evolution of a new approach to emerging markets:

1. the high growth rates of developing countries that pushed foreign investors to focus on those markets that lead global growth
2. the emergence of business ethics that pushed companies and Non Governmental Organizations (NGOs) to strengthen their efforts in order to serve poor people

Companies noted that responding to local market needs with a simple local adaptation of global products developed in their (mainly) western headquarters (*glocalization*) was ineffective in exploiting the entire potential of these growing markets (London & Hart, 2004). From an NGO's perspective, the aim of improving the lives of poor people by serving them with the technology developed and available in developed markets was unsuccessful because not only could poor people not afford this technology but also because it was only partially exploitable due to environmental constraints.

Prahalad and Hart (2002), and later on Prahalad (2004), introduced the new approach to emerging economies as a source of significant profit generation through the development and commercialization of ad-hoc products and services for the markets of the poor.

Prahalad's approach is expressed in the title of his famous 2004 book "*The Fortune at the Bottom of the Pyramid: Eradicating Poverty through Profits*". The author identifies a large opportunity for MNCs operating in emerging economies. Most foreign MNCs that internationalize in developing countries adopt a *glocalized* approach. They design and develop global and technologically sophisticated products in their R&D labs in developed countries and later adapt them to local needs for other countries including the developing. Hence, MNCs can only serve a small part of the world population, those with the highest income who can afford to pay a premium price for the high R&D and manufacturing costs sustained by MNCs in developing and distributing these products.

This strategy allows foreign companies to serve only approximately one third of the world population, ignoring the poorest comprising almost 4 billion people (Prahalad & Hart, 2002; Simanis & Hart, 2006).

According to Prahalad's perspective, MNCs serving only the top of the pyramid in emerging economies suffer from business myopia in a way that closely recalls the marketing challenge that Christensen's incumbent firms faced in developing disruptive innovation for new or emerging market niches.

Serving the BOP would imply reconsidering some of the main assumption (Prahalad & Hart – 2002 - identifying 6 of them³) of MNCs operating in emerging economies (London & Hart, 2004), since they believe they are unable to make profit by serving customers who cannot afford, nor appreciate, costly sophisticated technology (London, 2007). Although Helling (2009) describes some major barriers in the application of this strategy, Anderson & Billou (2007) list four challenges to overcome (Availability, Affordability, Acceptability, Awareness) that would enable a firm to serve the BOP efficiently.

In order to do so companies have to rethink their strategies. Their business models have to be forged according to the new and stronger environmental constraints that characterize these markets and reach a large part of the world population that has never had access to up-to-date technologies (and sometimes have difficulty in accessing even simple products).

What is of great interest to us is that, although there is no direct and explicit link between these theories, the BOP concept shares some similarities with the disruptive innovation paradigm (Hart & Christensen, 2002). It suggests developing products and services for a market segment requesting different attributes than those of mainstream customers and, in particular, access to the same technology at a much lower price. In reality, it addresses a market that does not yet exist, seemingly configuring what Govindarajan and Kopalle (2005, 2006) identify as disruptive innovation that

³ 1- Rethinking the price/performance equation; 2- Rethinking brand management; 3- Rethinking the costs of market building; 4- Rethinking product design; 5- Rethinking packaging; 6- Rethinking capital efficiency.

creates a new market. In our opinion, innovation at the BOP cannot be easily, or entirely, assimilated with disruptive innovation theory. We will explain why in the next section, explicitly linking the BOP to the disruptive innovation paradigm.

4. Disruptive Innovations from Emerging Economies

Parallel to the work on “Serving the Bottom of the Pyramid”, a further wave of exploration was initiated by scholars linking the disruptive innovation paradigm and Prahalad’s non-served markets of the poorest in emerging economies (Hart & Christensen, 2002; London & Hart, 2004).

The argument of scholars applying disruptive innovation to explain the success of new products originating from emerging economies is as follows: foreign MNCs develop products for emerging markets and later use them to penetrate the low-end segment of developed markets in the US and Europe, and domestic firms leverage on their cost structure and knowledge of the domestic context to serve local, and later developed, markets.

To the best of our knowledge, Hart and Christensen (2002) for the first time introduced the link between the disruptive innovation framework and emerging economies. Their argument is clearly in line with Prahalad’s work referring to “innovation from the base of the pyramid”. The authors propose examples of Asian companies that succeeded in introducing disruptive innovations in low-income countries, enabling poor people to afford certain types of technological products and generating profits for themselves. In particular, they explain how Grameen Telecom (a firm that is part of the Grameen family) started to serve Bangladesh’s rural market with a wireless telecommunication service. The extremely low income that characterizes potential customers in this market made it unattractive to incumbent firms, but Grameen Telecom, leveraging on Grameen’s experience on micro-credit, set up a business model that allowed creating a new class of small entrepreneurs who, properly financed, equipped and trained, “sell phone usage on a per-call basis at an affordable price to others in their villages” (Hart & Christensen, 2002; p. 54).

Recently, Hang et al (2010), demonstrated four cases of Asian companies that, starting from their low-income markets (China and India), developed disruptive products. The success pursued in these markets brought them performance improvements on attributes that had at first been neglected and valued by mainstream customers in developed economies. This pushed them to invest globally and to steadily grow in developed economies. Thus, products developed in emerging economies for their domestic markets are also finding more and more market response in developed countries.

We believe that in both works cited above, the disruptive innovation concept is used in a way that differs from the traditional application of the concept within established markets in developed economies. The traditionally defined disruptive innovation paradigm (Bower & Christensen, 1995; Christensen, 1997) claims that new products (or services) are considered disruptive when they respond to an ignored and new market segment that is usually small, unprofitable for incumbents and has differentiated needs in terms of product attributes.

Could we say that the two cases of innovations originating in emerging markets presented by Hart & Christensen (2002) are indeed disruptive innovations?

We think this is true only in part, and that three limitations need to be considered in relation to the characteristics of disruptiveness mentioned above. In particular, we need to consider 1) the categorization of mainstream and non-mainstream customers 2) market size and 3) disruptive innovators (see Table 1):

1. Foreign MNCs operating in emerging economies have traditionally served those markets adopting a glocalization approach to market segmentation. Thus, they adapted global products to the local needs serving customers that correspond and share similar characteristics to those segments served back in their country of origin or in developed

- markets. These are their mainstream customers, who might represent the great majority at home but in emerging economies represent only the top of the pyramid. Adopting a marketing perspective instead, as the disruptive challenge requires us to (Christensen, 1997; Danneels, 2006), mainstream customers in emerging markets should be defined as the large part of the population (be it individuals or companies) that cannot afford expensive state of the art technology and that are partly served by local companies that can interpret their needs and respond to them thanks to their cost-structure.
2. One of the main challenges that incumbent firms face when developing or responding to disruptive innovations in their markets is that the size of the emerging market with different requirements is too small to cover the development costs of new products (Christensen, 1997; Christensen & Raynor, 2003). Indeed, the size of the market does not match the size of the company and its related cost structure as it does in the case of small entrants or spin-off companies. This is not true in emerging economies where the market served by innovations, as in the cases presented in Hart & Christensen (2002) and Hang et al (2010), is much bigger than that served by *glocal* products so that the market size is potentially huge, assuming that access to these market segments is feasible.
 3. Disruptive innovations in developed economies generally come from a small entrant firm (e.g., a start-up company) that is generated by either a new entrepreneurial activity or a spin-off company from an incumbent firm (Bower & Christensen, 1995; Christensen, 1997; Christensen & Raynor, 2003; Walsh et al, 2002). The generation of disruptive innovations in emerging economies could be developed by domestic companies that naturally have a cost structure and a market orientation that fits the local environment and by subsidiaries of MNCs that have evolved and gained enough autonomy to develop new products.

5. Cost Innovation

The growing tendency of innovation likely to be thought of first in and for the developing world is often referred as cost innovation. In particular, Zeng and Williamson (2007) wrote a book (*Dragons at your Door: How Chinese Cost Innovation is Disrupting Global Competition*), reporting how innovations developed by Chinese companies are disrupting global markets by primarily leveraging on new, low-cost based, business models.

As the authors state in their book, the main assumption is that companies wanting to serve the huge and constantly growing Chinese market (or any other emerging economies) have to undertake a radical change in their business models, pursuing the ability to provide what the authors describe in three points:

1. High-technology at low-cost
2. Variety and customization at low-cost
3. Specialty products at low-cost

Because of the strong focus on low-cost, the innovating process is here defined “cost innovation”, resulting in “products or services that initially look inferior to existing ones in the eyes of established players” (Zeng & Williamson, 2007; p.55).

In stating this, innovation considered to be disruptive by the authors is low-end innovation where the same functionalities of products and services are provided but at a dramatically lower price. The point of departure that allows these companies to pursue such low-cost innovation does not rely on low-cost labour force. At least not only and not even primarily. Even if the lower cost of skilled

employees plays a role in competitive advantage, the main issue regarding disruptive innovations concerns the way companies pursue such a cost reduction through the different organization of development and production activities and completely original business models that change the way profits are made.

We should rather speak of business model innovation pursued through a series of process innovations that allow companies to serve large markets with low margins instead of competing with the incumbents serving high-end markets with higher margin. The competition is thus on volume rather than on margins, and foreign MNCs have to respond to the threat from developing countries by “learning the tricks of cost innovation” (Williamson & Zeng, 2008; p.3) (Williamson & Zeng, 2004; Williamson, 2005).

6. Reverse Innovation

In the previous sections, we showed how the disruptive innovation paradigm does not adequately fit the description of innovations developed for emerging economies and afterwards “exported” back to developed economies. *Reverse Innovation* (Immelt et al, 2009; Seely Brown & Hagel, 2005) is a more suitable concept that helps us understand this trend. Indeed, this is a new conceptualization that has been developed to explore innovation from emerging economies. This new line of research argues that innovation is less likely to come from, and is adopted in, developed countries first, but is conceived and adopted in emerging economies first to then be introduced to developed markets. It is then “exported” to the developed economies. These dynamics reverse the innovation process as intended in past literature and managerial practice. The reasons that support such an inverted process lie in the market growth of the developing countries that are supporting and leading the global economy.

The trend of innovation from developing countries, thus reversing the innovation process as generally intended from developed to developing economies, is partly anticipated by the concept of disruptive innovation from emerging economies that we described above. Seely-Brown & Hagel (2005) delve into the theme and call it “innovation blowback”, introducing the risk of Western companies being displaced by MNCs from emerging economies that are going global and disrupting the markets of developed economies (Zeng & Williamson, 2007). Seely-Brown & Hagel (2005) stress the importance of learning by operating in emerging economies; serving the low-income segments of these markets to gain a competitive advantage that will foster their growth on a global basis. They explain how western MNCs cannot simply adapt global products to local needs by cutting costs thanks to the local low-cost labour force. They have to reshape their business and management practices in order to gain access to these promising markets and build their future global competitive advantage on this experience.

A step further is made by Immelt, Govindarajan and Trimble in their Harvard Business Review Article, “*How GE is disrupting itself*” (2009). In this work, they show how GE is benefiting from its presence in the markets of emerging economies, specifically China and India, to develop breakthrough innovations that are introduced and successfully commercialized first in developing countries and later, when performance improvements are acceptable, in developed countries.

They provide a clear example in the Chinese health-care sector. In the 90s, GE implemented *glocalization* in China. Leveraging on the experience of its US and Japanese research centres, GE developed an ultrasound machine that was mainly sold to sophisticated high-end hospitals around the world. The machine sold poorly in China due to the high price of around US \$100.000 and the different health-care infrastructure largely characterized by low-end hospitals and rural clinics. In 2002, a portable machine (combining a laptop and sophisticated software), providing similar

functions, was developed by a GE local team in China and was sold for US \$30-40.000 to Chinese rural clinics and US ambulance squads. In 2007, the same machine benefited from a further price reduction, expanding the market for portable ultrasound machines. Furthermore, “thanks to technology advances, higher-priced PC-based models can now perform radiology and obstetrics functions that once required a conventional machine” (Immelt et al, 2009; p. 7).

A product perfected in and for the emerging market was first sold also in developed economies for different uses and later disrupted existing products in some markets as a result of performance improvements on the attributes most valued by mainstream customers.

The authors stress the importance of Local Growth Teams (LGTs) as new units, independent from their MNC HQ, built from scratch in emerging economies. They are responsible for the complete development and commercialization of products leveraging headquarter technology but developing completely new offerings that match the market they operate in.

The authors astutely set *reverse innovation* against *glocalization* in a way that challenges the conventional wisdom of foreign firms operating in emerging economies. They explain how in order to compete in emerging economies, foreign MNCs have to rely on LGTs in order to develop innovations that fit local needs and overcome local constraints. At the same time, they do not neglect the *glocalization* paradigm in line with which MNCs have to continue to operate to serve high-end markets and build part of the technological knowledge that is essential for the activities of LGTs in emerging economies.

7. Overlapping Areas Between Disruptive and Reverse Innovation

Despite the above considerations, the innovation concept that the authors define as reverse innovation is, in our opinion, a form of disruptive innovation. The characteristics that Immelt et al (2009) list and illustrate to describe reverse innovation match those described in the previous sections of this paper recalling the disruptive innovation theory as illustrated by Christensen & Bower (1995), Christensen (1997), Christensen & Raynor (2003), Acee (2001), Utterback & Acee (2004), Govindarajan & Kopalle (2005, 2006). In particular, reverse innovation shares great similarities with the concept of disruptive innovation from emerging economies as illustrated by Hart & Christensen (2002), Zeng and Williamson (2007) and Hang et al (2010).

Govindarajan and Trimble responded to this parallelism themselves following the requests of some readers of their paper who asked for clarification between disruptive innovation and reverse innovation. They did so on Govindarajan’s blog in a specific post entitled “*Is reverse innovation like disruptive innovation?*” (September 30, 2009⁴). The post directly refers to the 2009 HBR article to distinguish between disruptive and reverse innovation. The authors state that there is an overlap between the two concepts but only some cases of reverse innovation are also disruptive innovations. They go on to explain, “A reverse innovation, very simply, is any innovation likely to be adopted first in the developing world” and list three primary situations, or gaps, that open the opportunity for reverse innovation:

1. Income gap
2. Infrastructure gap
3. Sustainability gap

These three gaps represent the differences between developed and developing countries that are likely to be the basis for reverse innovation. Govindarajan & Trimble argue that only in the first

⁴ Due to the novelty of the topic, relying on the blog of the scholar who coined the term is crucial in understanding the concept.

case innovation would take the shape of disruptive innovation. They thus consider disruptive innovation only from a price/performance point of view, and not as a market widener or a provider of new functionalities, implicitly stating that disruptive innovation can only have a lower price.

We do not believe this is completely true. Referring back to Govindarajan's works on disruptive innovation, we note that Govindarajan & Kopalle (2005) define disruptive innovation as "*a powerful means for broadening and developing new markets and providing new functionality, which, in turn, disrupt existing market linkages*"

In 2006, the same authors provided a different definition of disruptive innovation that does not merely focus on lower price/lower performance. As previously stated by Christensen & Raynor (2003), disruptive innovation can thus generate a new market by leveraging on non-served segments or respond to the most price sensitive segment of mainstream customers by lowering product price. Therefore, the focus now lies in the alternative attributes that are offered by the innovation in relation to an existing product. These new products are able to penetrate the market starting from early adopters and improve performance in the "mainstream" thanks to the experience accumulated in serving the new segment. In line with Christensen & Raynor (2003) and Utterback & Acee (2005), Govindarajan and Kopalle (2006) define disruptive innovation in the way presented in the second section of this paper and include both new, low-end and high-end attributes to existing products that initially are tempting only to new customers (thus not necessarily price-focused) or the most price sensitive mainstream customers, but in developing over time they also gain the attention of mainstream customers and the market.

The case of the ultrasound machine is thus a clear example of both reverse innovation and disruptive innovation. Govindarajan himself reinforced this insight in his blog post entitled "*What is reverse innovation?*" published on October 15, 2009. Following a definition of reverse innovation as reported previously, he stated that the fundamental driver of reverse innovation is the income gap between developing and developed economies.

Furthermore, in their HBR article they seem to be rather focused on low-cost, configuring what in literature has been defined as low-end disruptive innovation from emerging economies (Hart et al, 2002; Hang et al, 2010). They also mention lack of infrastructure and sustainability problems as drivers for reverse innovation but reference seems nevertheless to be made to low-cost solutions, "a 50% solution at a 15% price... these products can create brand-new markets in the developed world – by establishing dramatically lower price points or pioneering new applications" (Immelt et al, 2009; p.5). The trend is also confirmed by several other posts that Govindarajan published in his blog on reverse innovation examples.

In summary, Govindarajan and Trimble state that reverse innovation has three drivers (although Govindarajan stresses the fundamentality of the income gap) but they do not provide any example of reverse innovation that is not linked to the income gap and thus that is not in the shape of disruptive innovation. Based only on this argument, we cannot exclude a complete overlap between the two concepts. Indeed, even if we consider the other two situations (infrastructure and sustainability gap) where reverse innovation can occur, they can certainly give origin to both low-end and high-end disruptive innovations as intended by Govindarajan and Kopalle (2006).

Beyond the conceptual similarities we have discussed up to now, reverse innovation and disruptive innovation from emerging economies (developed by foreign MNCs) have some other common points:

- the same risks of cannibalizations for companies that have previously invested in the same industries for mainstream customers (Immelt et al, 2009; Govindarajan & Kopalle, 2005, 2006), which is also a tool for measuring the potentiality of firms to develop disruptive innovations (Govindarajan & Kopalle, 2005).
- as anticipated by Seely Brown & Hamel (2005), Williamson & Zeng (2004), Williamson (2005), Zeng & Williamson (2007) and Williamson (2010) with reference to business models, disruptive innovations are a tool to pre-empt giants from emerging economies that

are going global with a new price-performance offering, which is exactly the same purpose of reverse innovation (Immelt et al, 2009).

- LGTs that Immelt et al (2009) explain as crucial for the development of innovations for emerging economies mirror the spin-off companies described by Christensen & Overdorf (2000), Christensen et al (2000), Christensen & Raynor (2003), Danneels (2004; 2006), as the best solution for incumbents that want to compete with or develop disruptive innovations.

We therefore believe the main contribution of reverse innovation as described by Immelt et al (2009) is to be interpreted within the disruptive innovation paradigm, particularly with reference to innovations developed thanks to the market inputs of emerging countries.

We believe that Immelt et al (2009) make an important contribution, enriching the disruptive innovation paradigm from the emerging countries perspective by stressing the importance of LGTs in developing new products for local markets.

8. Geographic Dimension of Disruptive Innovation

As discussed in the previous section, it is possible to see reverse innovation as a particular manifestation of disruptive innovation, can we thus simply generalize the findings and implications of disruptive innovation originating from developed countries to situations of reverse innovation?

The answer is no. Such a generalization does not work, since success stories of disruptive innovation originating from developed markets differ substantially from success stories that export successful products back to developed markets that were first introduced in emerging economies.

Table 1 summarizes the main differences discussed below:

- *Early market*: in disruptive innovation theory, the market segment served by the new technology is characterized by early adopters: innovation oriented customers who seek new attributes in existent products and are willing to experience and experiment first, as they are eager for change. New customers represent only a small niche or segment of the established market. In reverse innovation, the early market is instead represented by the large part of the population, or BOP, that has no access to the established technology because it is either too expensive or too complex. This is hardly the case with early adopters and developed markets. These differences should lead to completely different marketing strategies.
- *Actors*: the small size of the early market in disruptive innovation theory makes spin-off companies or small new entrants the only actors able to serve this market profitably. On the other side, the vast size of the new market segment to be served in emerging economies allows foreign MNCs subsidiaries and large local companies to make profit from it by exploiting economies of scale.
- *Expansion*: the evolution of disruptive products conceived *in* and *for* developed markets brings innovative technologies to commercialization in the same markets as the established ones, while disruptive products introduced *in* and *for* developing economies allow foreign MNCs and domestic companies to export their evolved disruptions to mainstream markets in developed countries, configuring a process of reverse innovation

- *Maturation of technology*: the technological evolution of disruptive innovations is the same in both cases, but while in disruptive innovation theory this occurs in the same country market, in reverse innovation we see it happening in developing economies and brought to developed economies once the technology has evolved
- *Challenges*: the development of a technology on a new trajectory puts new entrants in established markets in competition to reach new technological standards. In emerging economies, the main challenge is the difficulty of reaching a vast market that often lacks adequate complementary assets (such as distribution and logistics infrastructures). Furthermore, cultural and institutional differences make it difficult for foreign firms to understand and properly respond to market needs.
- *Competition/success is based on*: in traditional disruptive innovation theory, the “battle” is won by the company that develops the new technology better and faster, satisfying at first the request for new attributes and, along within technological evolution, catching up on the mainstream attributes. In reverse innovation, competition is instead based on the ability to develop a new business model that allows companies to serve a large portion of the market in order to achieve large sales volumes and economies of scale.

9. Disruptive Innovation in Reverse: Towards a Research Agenda

In light of the discussion presented in this paper, we can conclude that reverse innovation can be defined as a form of disruptive innovation that originates not from the same geographical market that incumbent companies dominate, but rather from the markets of emerging economies, where a technology/product has been commercialized to fit the characteristics of those markets, particularly serving the vast bottom of the pyramid.

The disruptive innovation framework provides us with the dynamics to look at innovation that originates for emerging economies. However, the challenges, evolution and factors leading to success or failure of reverse innovation are different from those that are relevant when disruptive innovation originates from a developed market.

We therefore argue that instead of simply generalizing the findings of disruptive innovation to emerging economies, future studies should take into consideration innovations that originate for those markets.

Innovating in foreign countries requires a deep understanding of the local culture and business environment. This is particularly true for emerging economies with crucial differences in management and business practices as well as in general social interactions. Research in this area should therefore include a cultural and anthropological perspective. Several works have considered culture as a major determinant in different business areas: human resources (Hofstede, 1980, 1988, 1991; Hampden-Turner & Trompenaars, 1997), entry strategies (Kogut & Singh, 1988; Nakino & Neupert, 2000), negotiation (Lin & Miller, 2003; Faure & Rubin, 1993), marketing (Usunier & Lee, 2005; Herbig, Nevins & Money, 2008; Nes et al, 2007). We think in-depth studies that focus on low-income growing markets such as China and India are needed for the future.

In particular, contributions should link global innovations deriving from MNC activities in emerging economies and Open Innovation (OI) dynamics. As reported by Seely-Brown & Hamel (2005), Zeng & Williamson (2007) and Williamson (2010), organizational structure and business models are key areas to learn how to serve low-income countries and how to develop innovations from those market inputs. In their contributions, several similarities with the OI model can be identified. Innovation is derived from strong local market inputs and therefore developed thanks to (potential) customer cooperation rather than a technological push. Cultural and institutional

differences push foreign MNCs to observe and interact with local suppliers and competitors for a reciprocal exchange of information on markets and technologies.

Chesbrough, in his “Open Services Innovation: Rethinking Your Business to Growth and Compete in a New Era” (2011), dedicates a chapter to emerging economies showing how OI can be a fruitful way to reach those markets and learn from them.

Strong intellectual property regimes are required to implement an innovation strategy that is based on an open model. This may be a problem in developing countries since they are shown to have weak intellectual property regimes (IPR) (Zhao, 2006). Despite this, recent contributions show how to overcome this problem in developing economies (Keupp et al, 2010) such as China (Keupp et al, 2009; Quan & Chesbrough, 2010), presenting successful cases of foreign companies that implement R&D activities in China, providing useful tools for overcoming the IP violation risk.

As reverse innovation dynamics unfold, we expect to see new business models evolve, new forms of interaction between MNCs and local partners, as well as new opportunities for entrepreneurs trying to adapt technologies across distant markets.

<i>Characteristics / Location</i>	<i>Early Market</i>	<i>Actors</i>	<i>Expansion</i>	<i>Maturation of Technology</i>	<i>Challenges</i>	<i>Compete/Succeed based on</i>
<i>Disruptive Innovation in Developed Countries</i>	<ul style="list-style-type: none"> Advanced/Innovative early adopters seeking to be “educated” and to try the new technology. Typically small, advanced niche 	Spin offs or new entrants able to be flexible enough to serve the niche	Into mainstream market of the same country through a process of upgrading “mainstream technological attributes”	Profits from early markets are invested (driven by early market requests) into the development of technology that is improved with respect to that from incumbents through path dependence	Standard battle amongst start-ups	<ul style="list-style-type: none"> Speed of development High margins once the incumbents have been disrupted
<i>Disruptive Innovation in and from Emerging Economies</i>	<ul style="list-style-type: none"> Large majority of population with no means to get to established technologies Typically large BOP 	Subsidiaries of MNCs and large local companies that are able to exploit economies of scale	Into mainstream market of emerged countries through a process of reverse innovation	Same process of maturation	<ul style="list-style-type: none"> Distribution in vast markets Requirement to access market needs Requirement to understand and respond to market needs 	<ul style="list-style-type: none"> Volume Costs and reorganization of products/services

Table 1. Differences between disruptive innovation in emerging and developed economies

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