Reverse Innovation: In Search for Dually Disruptive Potential

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Abstract: The concept of reverse innovation, i.e. innovation diffusing from emerging to developed economies, has been recently introduced by Immelt et al. (2009). Given its novelty, this concept still needs to be integrated with literature on locus, characteristics, and diffusion of innovation. Aiming to initiate this integration, the following paper makes two important theoretical contributions. First, growth potential that reverse innovations represents to multinational enterprises (MNEs) is put in the context of disruptive innovation theory (Christensen, 1997; Christensen and Raynor, 2003). However, in contrast to Christensen's dichotomic classification of innovations in either new-market *or* low-end disruptive, this paper provides analytical proof that reverse innovations in products may simultaneously be both, new-market *and* low-end disruptive. Potential benefits of reverse innovations to MNEs result exactly from this duality. Second, for innovations in products, this paper proposes that constellations in which reverse innovation is likely to occur have a systematic background. Specifically, in a pair consisting of a particular emerging and a developed country, reverse product innovations are the more likely the bigger the overlap of income distributions in these two countries. Therefore, as income differences between emerging and developed economies decrease, the occurrence of reverse innovations is anticipated to concomitantly increase.

Keywords: Reverse innovation, dually disruptive innovation, locus and diffusion of reverse innovation.

1. Introduction

Embracing the ideas originally promoted in the seminal work by Schumpeter (1911), a century later, innovation is widely considered "a central driver of economic growth" (INSEAD, 2011: xi). Innovation, rather than monopoly or market power, is the key factor for success of multinational enterprises (MNEs; Buckley and Casson, 1976).

With regard to its locus and diffusion, well established theories assume that innovation would most likely occur in developed countries and diffuse from there either "horizontally", among developed economies, or "downward" to emerging/developing ones. The International Product Life Cycle theory is arguably the most prominent example explicitly promoting this assumption (Vernon, 1966; Vernon, 1979). More recently, however, Immelt et al. (2009) have established the concept of "reverse innovation", which refers to cases "where an innovation is adopted first in poor (emerging) economies before 'trickling up' to rich countries" (Govindarajan and Ramamurti, 2011: 191). Some well-known examples of reverse innovation include General Electric's handheld electrocardiogram devices (innovated for rural India) and Embraer regional jets (innovated for Brazil), both of which eventually diffused to developed markets. Although not calling them explicitly "reverse innovation", Deloitte (2006: 10-11) mentions several additional examples, such as inexpensive Renault's Logan car, designed for the Eastern European market in Romania but becoming popular "around the world, including in Western Europe".

Simultaneously, economic evidence is consistent with claims (e.g. by Govindarajan and Trimble, 2012) that reverse innovation represents tremendous potential for MNEs from developed and emerging economies alike. For example and notwithstanding the fact that creativity is not innovation itself but one of its strongly correlated inputs (Hollanders and van Cruysen, 2009), the South-North trade in creative goods has proved more resilient to economic shocks than the rest of global trade since it has been growing at double digit rates even during the last financial crisis (UNCTAD, 2010). More generally, the sheer market size of emerging markets indicates their immense potential for innovations. In 2012, the combined gross domestic product (GDP) of most prominent emerging economies – Brazil, Russia, India, and China – exceeds the combined GDP of Japan and the US at purchase power parity (Economist Intelligence Unit, www.eiu.com).

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In this context, this paper's contribution to the recent academic discussion on reverse innovation is twofold. First, reverse innovation is put in the perspective of the theory of disruptive innovation (Christensen, 1997; Christensen and Raynor, 2003). Yet in contrast to this theory's dichotomic classification of disruptive innovations in either new-market *or* low-end disruptive, reverse innovations may simultaneously be both, new-market *and* low-end disruptive. Inherent benefits of reverse innovation to MNEs derive exactly from this dually disruptive potential. Second, constellations in which reverse innovations occur are by no means arbitrary. In a pair consisting of a particular emerging and a developed economy, reverse innovations rather result from market segments that overlap with regard to customers' income.

2. Dually Disruptive Potential of Reverse Innovation

Extant literature on innovation has established different classifications. For example, at the level of a single firm, it is mostly recognized that innovations may occur along dimensions product, process, and organisation (EC, 1995). Independently of a particular dimension of their occurrence, Schumpeter (1911) distinguished between incremental and radical innovations: "In Schumpeter's words, 'radical' innovations shape big changes in the world, whereas 'incremental' innovations fill in the process of change continuously" (OECD, 2005:17). However, from the perspective of this paper, the classification established with the theory of disruptive innovation deserves particular consideration. This theory generally distinguishes between "sustaining" and "disruptive" innovation: sustaining innovation does not affect established markets and value networks, but rather leads to continuous improvement of existing offerings (Christensen, 1997). A value network is "the context within which a firm identifies and responds to customers' needs, solves problems, procures input, reacts to competitors, and strives for profit" (ibid: 36). Oppositely to sustaining innovations, disruptive innovations create new value networks, and may be either new-market *or* low-end disruptive. A new-market disruptive innovation aims at overcoming non-consumption as alternative and at creating a new value network (Hart and Christensen, 2002; Christensen and Raynor, 2003). On the other hand, low-end disruptive innovations initially address the low-end segment of a market being over-served by performance of mainstream offerings. Subsequently, however, low-end disruptive innovations gradually improve to eventually reach the performance of mainstream incumbents, hence disrupting previous value networks (Christensen, 1997; Christensen and Raynor, 2003).

Connecting the concepts of disruptive and reverse innovation, Corsi and Di Minin (2011) suggest conceptualizing reverse innovation as a subtype of disruptive innovation, i.e. as disruptive innovation diffusing from emerging markets. This is in line with Hang et al. (2010), who synonymously use the terms "reverse innovation" and "disruptive innovation". These papers usefully draw attention to the fact that reverse innovations are potentially disruptive, particularly to developed markets, yet this insight still does not change the fact that innovations are solely required to diffuse from emerging to developed markets in order to be considered reverse – be these innovations disruptive or not (Immelt et al., 2009; Govindarajan & Ramamurti, 2011). Nevertheless, reverse innovations have an interesting feature with regard to the theory of disruptive innovation: one particular reverse innovation may potentially be classified differently ex ante and ex post. Specifically, innovations targeting less affluent customers in emerging markets may be ex ante new-market disruptive but become low-end disruptive ex post, since they could:

- initially address the non-served bottom market tier of an emerging market, thus being new-market disruptive;
- incrementally improve to satisfy performance requirements of the over-served low-end of the emerging market in question; at this point, initially new-market disruptive innovations becomes low-end disruptive to this particular emerging market;
- improve further, and at some point satisfy performance requirements of the over-served low-end of developed markets; at this point, initially new-market disruptive innovations are potential subjects of reverse innovation and, if really diffused, equally low-end disruptive to these developed markets; and
- finally take a further performance improving trajectory and potentially advance to the point where they intersect with the performance level of mainstream incumbents in developed markets.

Therefore, reverse innovations may be considered both, new-market disruptive to emerging markets and low-end disruptive to developed markets, which has not been accounted for in Christensen's dichotomic

theory of disruptive innovation. Consequently, reverse innovations form a third category of *dually disruptive* innovations. This is in analogy with the finding that incremental and radical innovations rather form a continuum, although they may appear dichotomic (Abernathy and Utterback, 1978).

Exactly the dual character of reverse innovations results in their augmented growth potential for MNEs. Enterprises pursuing reverse innovations can capture the benefits of both disruptions, new-market disruption (in emerging markets) and low-end disruption (in developed ones). By doing so, MNEs would accelerate their growth as compared to pursuing only one disruption. Accelerated growth potential is consequently the most obvious rationale for MNEs to seek for reverse innovation, yet not the only one: MNEs from developed economies may pursue reverse innovation for defensive reasons as well, i.e. in order to preempt rising competitors from emerging economies.

Prime examples of reverse (product) innovations that the World has seen so far – foremost GE's medical devices and Tata's Nano, the World's most inexpensive car – confirm these conclusions. These products were new-market disruptive when initially introduced to the Indian market and allowed both companies to significantly increase their turnovers in India by targeting local customers not being served before (Immelt et al., 2009; www.tatamotors.com). When introduced to developed markets, these products have clearly become low-end disruptive, thus further increasing sales volume. For example, GE's medical devices innovated for India sell in the US at ca. 15% of the price of high-end products, yet at higher margins (Immelt et al., 2009). A feature rich version "Nano Europa", presented at Geneva motor show 2009 (www.autonews.com), priced at ca. $6.000 and targeting developed markets, is yet to be sold in Europe, but likely to have similarly positive impacts on Tata's business performance.

3. Constellations Fostering Reverse Innovation

Extant literature on reverse innovation identifies several examples *after* they have been introduced to both, emerging and developed markets. Hardly any predictions in terms of future locus and diffusion of reverse innovation have been made so far. However, at least for reverse innovation in products, country constellations in which reverse innovation is likely to occur have a systematic background.

Consider the following figure and, for the sake of simplicity, assume that (1) all innovations occurring in a single market target customers with a specific income; and (2) all innovations are as frequent as the corresponding income. For example, innovations targeting the income level A are in India much more frequent than those targeting the income level C; in the US, it is vice versa.
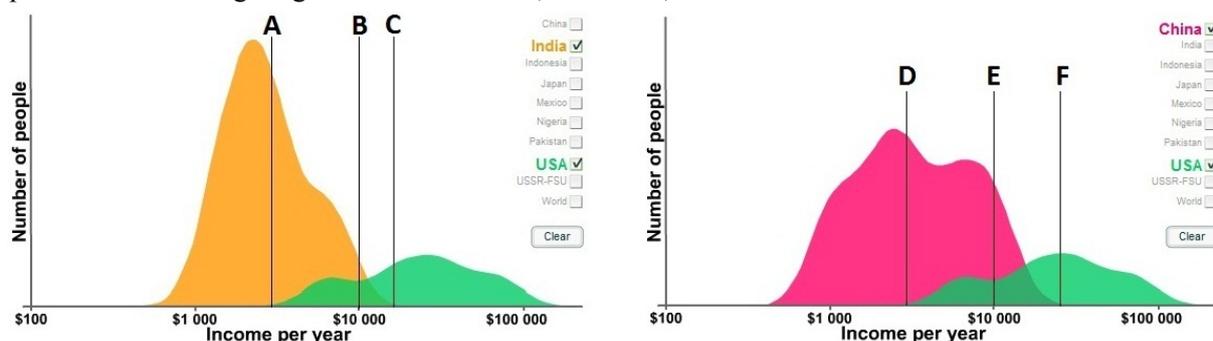

Figure 1: Income distribution 2000; source: Gapminder Foundation (www.gapminder.org), adapted

Admittedly, the assumptions made here might be strong ones, since they disregard issues with distribution chain and accessibility, differences between commodities and distinguishable products/services, value of product/service (e.g. performance/price) etc. However, under these assumptions, the impression that extant literature provides more examples of reverse innovations diffusing from China than from India (e.g. in Hang et al., 2010) has a rather systematic background. Certainly, China has achieved a higher level of development and industrialisation than India, reflected e.g. in higher GDP per capita (Economist Intelligence Unit, www.eiu.com). Equally so, global innovation index (INSEAD, 2011) ranks China (29th) higher than India (62th), which simply means that China has higher innovative potential and output. Nevertheless, these facts explain only a half of the story: per definition, reverse innovations are pertinent to *pairs* of countries, since these innovations need an emerging market as their origin and a developed one as the subject to their

diffusion. More precisely, in a pair consisting of an emerging and a developed market, reverse innovations need overlapping consumer segments in terms of income. Therefore, reverse product innovations from India to the US are only those innovations for Indian market that equally find a targeted income segment in the US. Consider the figure above again: the income overlap DF (China & US) is wider than AC (India & US). Given that the Chinese economy has been growing faster than the Indian over the last decade (Economist Intelligence Unit, www.eiu.com), the difference in overlaps is nowadays arguably even more stressed than it was in 2000. In addition, within the overlap AC, the propensity for Indian reverse innovation to occur diminishes at margin since the fast decrease of the number of Indian consumers within this range is only partly compensated for by the slow increase in the number of US consumers. This is not so in the case of China and the US, especially not within the overlap DE.

Imagine a hypothetical example of a product innovation targeting the income level of $10.000 p.a. (i.e. levels B and E). Such an innovation is much more likely in China than in India, consequently also a there-from resulting reverse innovation. Indian income segments below the level A including the customers at the "Bottom of the Pyramid" may (Prahalad, 2005) or may not (Karnani, 2007) represent significant growth potential for (foreign) MNEs. In any case, innovations targeting these income segments in India are less likely to diffuse to developed markets, e.g. the US, due to the absence of any costumers with the same income level.

Overall, in a particular pair consisting of an emerging and a developed country, reverse innovation is the more likely the bigger the overlap of income distributions. Given that emerging markets grow faster than developed ones, we are consequently going to witness the more reverse product innovations the more the income differences between developed and emerging economies (particularly Brazil, China, India, and Russia) decrease. This is a fundamentally different proposition than the current one claiming that "[i]nstances of reverse innovation still appear to be rare, and it is hard to tell if this will change materially in the future" (Govindarajan and Ramamurti, 2011: 191). The historical case of South Korea is consistent with an anticipated future increase in occurrence of reverse innovations. Shortly after the Korean War, South Korea was one of the World's purest countries. The development that the country took made it first "developing", than "emerging". Nowadays, some sources still consider South Korea an emerging economy (e.g. Dow Jones, www.djindexes.com), while some others already see it developed (e.g. Morgan Stanley, www.msci.com). However, simultaneously to the increase of South Korean income relative to the US (at purchase power parity 1997: 49%, 2012: 63%; Economist Intelligence Unit, www.eiu.com), South Korean MNEs such as Samsung, LG, and Hyundai have been gradually increasing the diffusion of their product innovations to developed economies.

4. Conclusions

Reverse innovations form a new category of innovations with regard to Christensen's theory of disruptive innovation, since they have a dually disruptive character: new-market disruptive to emerging markets and simultaneously low-end disruptive to developed ones. Exactly this duality results in a larger growth potential for MNEs than the pursuing of single-disruptive innovations, be these new-market or low-end disruptive. In order for this potential to materialize, however, MNEs need to identify the potential loci of reverse innovations. In a pair consisting of a particular emerging and a developed country, reverse product innovation is the more likely the bigger the overlap of income segments in both markets. For example, reverse innovations from China are presently more likely than reverse innovations from India. Given the above-average growth of emerging markets, their income gaps to developed markets are expected to decrease in future. Thus, the occurrence of reverse product innovations is expected to concomitantly increase. Possible exceptions are innovations in organization, processes, or commodities, all of which may target any income level. Another possible exception are innovative products/services from emerging markets that can be introduced into a niche of a developed market, similarly to the case of Honda's 50cc Supercub motorcycle, which had initially targeted less affluent customers in post-war Japan before it became popular among comparatively wealthy fans of dirt biking in the US (Christensen, 1997).

5. References

[1] Abernathy, W. J. and Utterback, J. M. (1978): "Patterns of Industrial Innovation". Technology Review, Vol. 80(7): 40-47.

[2] Buckley, P. J. and Casson, M. C. (1976): "The future of the Multinational Enterprise". Macmillan: London.

[3] Christensen, C. M. (1997): "The Innovator's Dilemma". Harvard Business Review Press: Boston, Massachusetts. Reprint 2002. Collins Business Essentials: New York, New York.

[4] Christensen, C. M. and Raynor, M. E. (2003): "The Innovator's Solution: Creating and Sustaining Successful Growth". Harvard Business School Publishing: Boston, Massachusetts.

[5] Corsi, S. and Di Minin, A. (2011): "Disruptive Innovation…in Reverse: a Theoretical Framework to Look at New Product Development from Emerging Economies". Working Papers 04/2011, Scuola Superiore Sant'Anna di Pisa.

[6] Deloitte (2006): "Innovation in emerging markets: Strategies for achieving commercial success". Deloitte Touche Tohmatsu.

[7] EC (1995): "Green Paper on Innovation". European Commission, Directorate XIII/D "Dissemination and Exploitation of R&TD Results, Technology Transfer and Innovation": Luxembourg.

[8] Govindarajan, V. and Ramamurti, R. (2011): "Reverse Innovation, Emerging Markets, and Global Strategy". Global Strategy Journal, Vol. 1(3-4): 191-205.

[9] Govindarajan, V. and Trimble, C. (2012) "Reverse Innovation: Create Far From Home, Win Everywhere". Harvard Business School Publishing: Boston, Massachusetts.

[10] Hang, C.-C., Chen, J. and Subramian, A. M. (2010): "Developing Disruptive Products for Emerging Economies: Lessons from Asian Cases". Research-Technology Management, Vol. 53(4): 21-26.

[11] Hart, S. L. and Christensen, C. M. (2002): "The Great Leap: Driving Innovation From the Base of the Pyramid". MIT Sloan Management Review, Volume 44(1): 51-56.

[12] Hollanders, H. and van Cruysen, A. (2009): "Design, Creativity and Innovation: A Scoreboard Approach". PRO INNO EUROPE.

[13] Immelt, J. R., Govindarajan, V. and Trimble, C. (2009): "How GE is Disrupting Itself". Harvard Business Review, Vol. 87(10): 56-65.

[14] INSEAD (2011): "The Global Innovation Index. Accelerating Growth and Development". Soumitra Dutta (Ed.), INSEAD – The Business School for the World.

[15] Karnani, A. (2007): "The Mirage of Marketing to the Bottom of the Pyramid: How the Private Sector Can Help Alleviate Poverty". California Management Review, Vol. 49(4): 90-111.

[16] OECD (2005): "Oslo Manual. The Measurement of Scientific and Technological Activities: Guidelines for Collecting and Interpreting Innovation Data". 3rd Edition, OECD Publishing.

[17] Prahalad, C. K. (2005): "The Fortune at the Bottom of the Pyramid: Eradicating Poverty through Profits". Revised and Updated 5th Anniversary Edition, 2009. Pearson Prentice Hall: Upper Saddle River, New Jersey.

[18] Schumpeter, J. A. (1911): "Theorie der wirtschaftlichen Entwicklung". Duncker & Humblot: Leipzig.

[19] UNCTAD (2010): "Creative Economy Report 2010. Creative Economy: A Feasible Development Option". United Nations Conference on Trade and Development (UNCTAD).

[20] Vernon, R. (1966): "International Investment and International Trade in the Product Life Cycle", Quarterly Journal of Economics, Vol. 80: 190-207.

[21] Vernon, R. (1979): "The product cycle hypothesis in a new international environment". Oxford Bulletin of Economics and Statistics, Vol. 41(4): 255–267.