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RESEARCH ARTICLE

Reverse Innovation, Innovation Research, Strategy, and Environmental Necessity for Innovation in Emerging Countries

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ABSTRACT

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The term reverse innovation or trickle up innovation was first coined by Vijay Govindrajan, Chris Trimble and Jeffery Immelt (2011). 'Reverse innovation' refers to the case where an innovation is adopted first in poor (emerging) economies before 'trickling up' to rich countries. In recent years although, the term 'reverse innovation' has gained strategic importance. Still, the literature in the above field is limited, in-spite of its huge scope & scale in emerging economies like India. A close inspection of the literature suggests that there are enough room of confusions as to what exactly is reverse innovations, how it is different from other types of innovations, what are the factors and environmental necessity needed for it to be successful.

Here a sincere attempt has been made to amalgamate the outcomes of all the earlier researches in the stated field so as to present the emerging hypothesized propositions and a simple framework of reverse innovations and its significance in emerging economies like India.

1. Introduction

This paper is divided into six section, first section talks about what is reverse innovation, types of innovations, model of reverse innovation, historical steps pertaining to the evolution of reverse innovation and examples of reverse innovation, second section depicts various dimensions of reverse innovation, third section explains various gaps in context to reverse innovation, while fourth section illustrates the linkages of disruptive innovation, frugal innovation and reverse innovation, fifth section proposes the conceptual model and sixth sections opens up for discussions and research methodology to be followed to explore the phenomena of reverse innovation.

'Innovation' is a word derived from the Latin meaning 'to introduce something new to existing area and order of things'. Innovation has always been a key phenomenon in business world which is supposed to be the virtue of developed countries because of their ability to undertake intensive research and development work. Cell-phones,

Sr.No	Type of Innovation for /from Developing Economies	Definition	References
1	Disruptive innovation	Affordable, "good enough" products that meet consumers' basic needs at a relatively low cost	Christensen (1997), Hang et al. (2010), Hart and Christensen (2002)
2	Innovation at the bottom of the pyramid	Innovation developed in and targeting the large unserved segments of poor people inhabiting emerging economies	London and Hart (2004),Prahalad (2004)
3	Trickle-up innovation	Innovations developed for the bottom of the pyramid that subsequently trickle up to the developed world	Prahalad (2004)
4	Indigenous innovation	A process of making use of technologies transferred from the advanced economies to develop superior technologies at home.	Lazonick(2004), Lu (2000)
5	Blowback innovation	Innovative solutions developed and adopted first in emerging markets	Brown and Hagel (2005)
6	Cost innovation	Leveraging developing economies' cost advantage to develop innovation at dramatically lower costs.	Zeng and Willianson (2007)
7	Reverse innovation	Innovations adopted first in poor (developing) countries before being adopted in advanced economies.	Govindrajan and Ramamurti (2011), Govindrajan and Trimble (2012), Immelt et al.(2009)
8	Shanzhai innovation	Chinese low-quality,low-price imitations of foreign branded products	Peng,Xu and Lin (2009)
9	Jugaad/ Gandhian Innovation	Innovations developed for the Indian market that responds to two Gandhian tenets: affordability and sustainability	Prahalad and Mashelkar (2010)
10	Frugal innovation	An innovation that has a large cost advantage, and in some cases inferior performance, compared to existing solutions, and developed in a resource-constrained context.	Zeschky,Widenmayer, and Gassmann (2011)
11	Resource-constrained innovation	Innovation developed in emerging economies in a context characterized by lower power of purchase, lower understanding of technology, and lower investment resources	Ray and Ray (2011)

Source: Zedtwitz, Max, et al. (2014), p.3

computers, refrigerators etc. all are originated in developed countries and later on flowed to developing countries as per their requirement and affordability. But, in present era, innovations are gradually taking place in emerging countries and then imitated in developed countries as per their demands. This is termed as reverse innovation. The concept is coined by Vijay Govindarajan, a world expert on strategy and innovation, Jeffrey Immelt in 2009 (Lohia & Taneja, 2013).Due to extensive literature on Innovation and types of innovation, phenomena of reverse innovation is frequently misunderstood with other forms of innovation. To get better understanding of the innovation concept below given table can be used.

I.2. Model of Reverse Innovation

Flow of Innovation: Ideation→Development→Markets(s)			
Innovation Activity	**Ideation**	**Development**	**Market Introduction**
Pre-requisite for a reverse innovation	Idea of product concept or technology originated in a developing country	Main locus of product development an R& D unit in a developing country	Product designed for and primarily targeting the market of a developing country.
Determinants of a reverse innovation	Product subsequently developed launched, or introduced in an advanced country	Product subsequently launched or introduced in an advanced country.	Product subsequently introduced in an advanced country.

Source: Zedtwitz, Max, et al. (2014),p.6
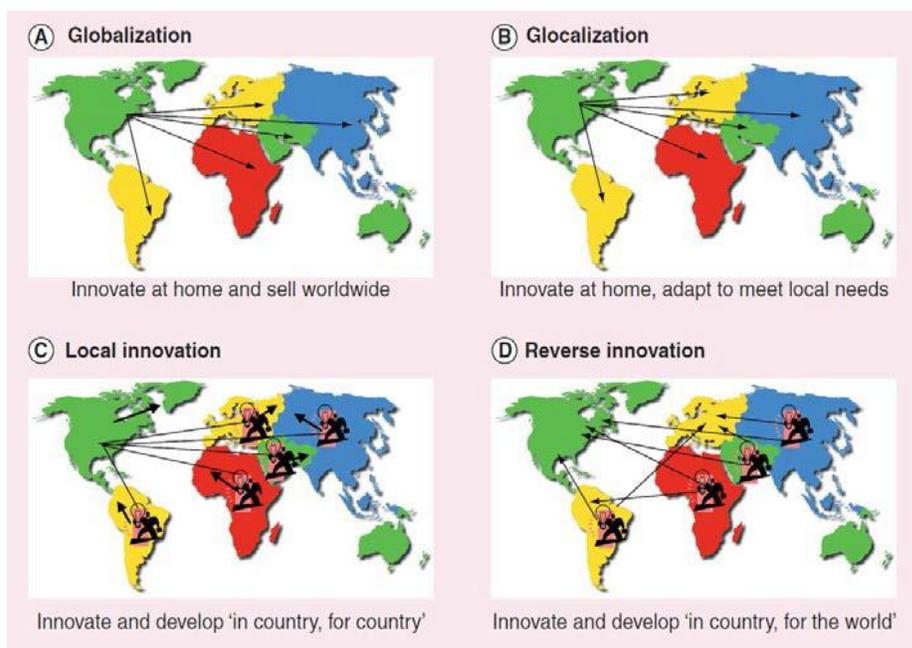
Source: Talaga, (2010), p.1401

I.4.Examples of Reverse Innovation

Company	Technology or Business Model		Market of Origin		Reverse Innovation (Western Markets)	
Nokia	Classified ad Model	Phone Sharing App	Kenya	Ghana	New models of ads	Features in US Phones
Microsoft	Phone app for web access using 'dumb' phones		India and South Africa		Low cost cloud computing platform	
GE	Battery-operated portable EKG Machine		India and China		Ultraportable EKG for first responders	
Tata Motors	Tata Nano	Tata Power	India	South Africa	Tata Europa	Municipal Power (Europe)
Veolia	Photovoltaic/wind electric hub for water treatment		Latin America		Distributed water treatment (US/Europe)	
LG Electronics	Low cost air conditioners		India		Low cost air conditioners	

Source: Adriaens, P., De Lange, D., & Zielinski, S. (2013),p.13.

II. Dimensions of Reverse Innovation

After, knowing what is reverse innovation in exact sense, next probable questions on, various dimensions of reverse innovation are well discussed by (V.Govindrajan & R.Ramamurti, 2011) these questions are:-

Sr. no	Question	Explanation	References
1	Why poor countries might be centers of innovations and what kind of innovations they might spawn-regardless of whether those innovations trickle up to rich countries	This phenomenon can be very well explained using literature on lead users and their role in diffusing innovations. In this framework, Hippel proposes that lead users as early adopters of cutting-edge innovations who have demanding standards are not very price sensitive, firms generally work with them to launch new products that later can be targeted at mainstream cosumers. In this particular framework the left tail of the distribution consists of laggards-individuals who are extremely value conscious, happy with 'good-enough'quality, and costly to reach and serve, a profile that resembles the mass market consumer in emerging economies.	Von Hippel (1986)
2	Why innovation is flowering in emerging markets today but did not in earlier decades	Economic liberalization in many emerging markets, coupled with a 'flatter' world brought on by technological change have spawned local firms in emerging economies that can draw on local and global resources to innovate for local markets	Friedman (2005) Wiliamson and Zeng (2009) Ramamurti (2009)
3	When and why innovations might move in the counterintuitive direction from poor to rich countries.	1. Innovations developed in EMs* may have a ready market among poor people in rich countries. * (Emerging Markets) 2. Dramatic cost and price reduction of 70 to 90 % achieved to succeed in EMs can help expand demand in rich countries. 3. New features incorporated for Ems, such as sturdiness, portability, or ease of use, may create new market segments in rich countries. countries	V.Govindrajan & R.Ramamurti (2011)

III. Five Substantial Need Gaps: in Reverse Innovation (As discussed by Vijay Govindrajan & Chris Trimble)

In fact, the needs and opportunities in the developing world are so different from those in the rich world that the very first requirements for reverse innovation success are humility and curiosity. You must let go of what you've learned, what you've seen, and what has brought you the greatest successes. In fact, it is best to assume that you have just landed on Mars.

Yes, buyers in the developing world have less money — but that is only the obvious beginning. The differences run much deeper. In fact, there are at least five enormous gaps that separate needs in the rich world from those in the developing world: the performance gap, the infrastructure gap, the sustainability gap, the regulatory gap, and the preferences gap.

1. Performance Gap

Simply put, with fewer dollars in hand, buyers in the developing world are willing to accept lower performance. This sounds simple enough, but it is not as straightforward as it at first appears.

Consider a typical "good-better-best" rich-world product line. When global corporations headquartered in the rich world export to the developing world, the tendency is to focus just on the "good" offering, or perhaps even to water down the "good" offering a little bit further, from "good" to "fair," to achieve the lowest possible price point.

This seems sensible enough on the surface. The problem is that a modest price cut — say, 10 percent — is not nearly enough to make a difference to mainstream customers in the developing world, who may have only one-tenth the income of buyers in the rich world.

Such low incomes, however, do not mean that developing world customers do not need innovative products. Indeed, what they need is radically reinvented designs that deliver at least decent performance at an ultra-low price. But there is no way to deliver 50 percent performance at a 15

percent price by diluting existing offerings. The only way to get there is to start from scratch, considering entirely new technologies.

2. Infrastructure Gap

In the rich world, most every citizen has access to modern transportation, communication, and energy systems, plus schools, hospitals, banks, courts, and more. In the developing world, most infrastructure is mostly still under construction.

This does not mean, however, that developing nations can only gradually catch up. Precisely because they are building from scratch, they can invest in the most modern technologies. Meanwhile, the rich world will only invest as existing infrastructure reaches replacement age, and, even then, will be constrained by the necessity to make any new systems compatible with what already exists. As a result, developing nations are hot, new construction markets, while rich nations are tepid maintain, repair, and replace markets.

The infrastructure gap, however, affects much more than infrastructure products and services. It affects any offering that relies on infrastructure — anything that plugs in, connects to a network, or moves from place to place, and more.

Rich world offerings are designed with the implicit assumption that they will be consumed by those with access to rich-world infrastructure. Logitech's mouse was designed for use in the office, not in the living room, because people in the rich world still largely "consume" video entertainment via cable or satellite, with no mouse in sight.

Such offerings do not export well, so an innovation strategy is a must. New offerings must be designed with the developing world infrastructure in mind. In major cities, this may mean an enviable, next-generation infrastructure. In rural areas, it may mean no infrastructure at all. When GE designed an ultra-low-cost portable EKG machine for rural India, for example, one of the top considerations was long battery life.

3. Sustainability Gap

Worldwide, as the economy grows, the conflicts between economic vitality and environmental sustainability are likely to become more severe. That said, the pressures will not rise uniformly. In many cases, the intensity of sustainability issues is highest in the developing world.

Winning in emerging markets requires recognition of these differences. In certain cities in China, for example, air pollution problems are extreme. As such, it is hardly a surprise that China is poised to take the lead in electric cars.

4. Regulatory Gap

When regulations function appropriately, they eliminate business behavior that is at odds with societal good. They keep consumers safe and markets fair. That said, when regulations become too complex, captured by vested interests, or technologically out-of-date, they can become needless barriers to innovation.

Regulatory systems in the rich world are the result of decades of development while those in the developing world may be incomplete. Whether this is good or bad from a societal perspective is well beyond the scope of this paper, but the difference can make the developing world a more favorable environment for innovation in certain cases. Products and services designed around rich world regulations may become needlessly complex or expensive for developing world markets.

5. Preferences Gap

The world's great diversity of tastes, preferences, rituals, and habits adds spice to international travel. It also sometimes makes it nearly impossible to achieve full potential in the emerging economies through a simple strategy of exporting existing offerings. PepsiCo, for example, is developing new snack foods, starting with a new base ingredient. Corn is not nearly as ubiquitous in India as lentils, so Pepsi is commercializing lentil-based chips.

Because of these five of enormous needs gaps, the commonplace strategy of trying to win in the emerging economies by making light adaptations of successful rich world offerings is inadequate. Reverse innovation is the antidote, and reverse innovation is clean-slate innovation. It starts with reassessing customer needs from scratch.

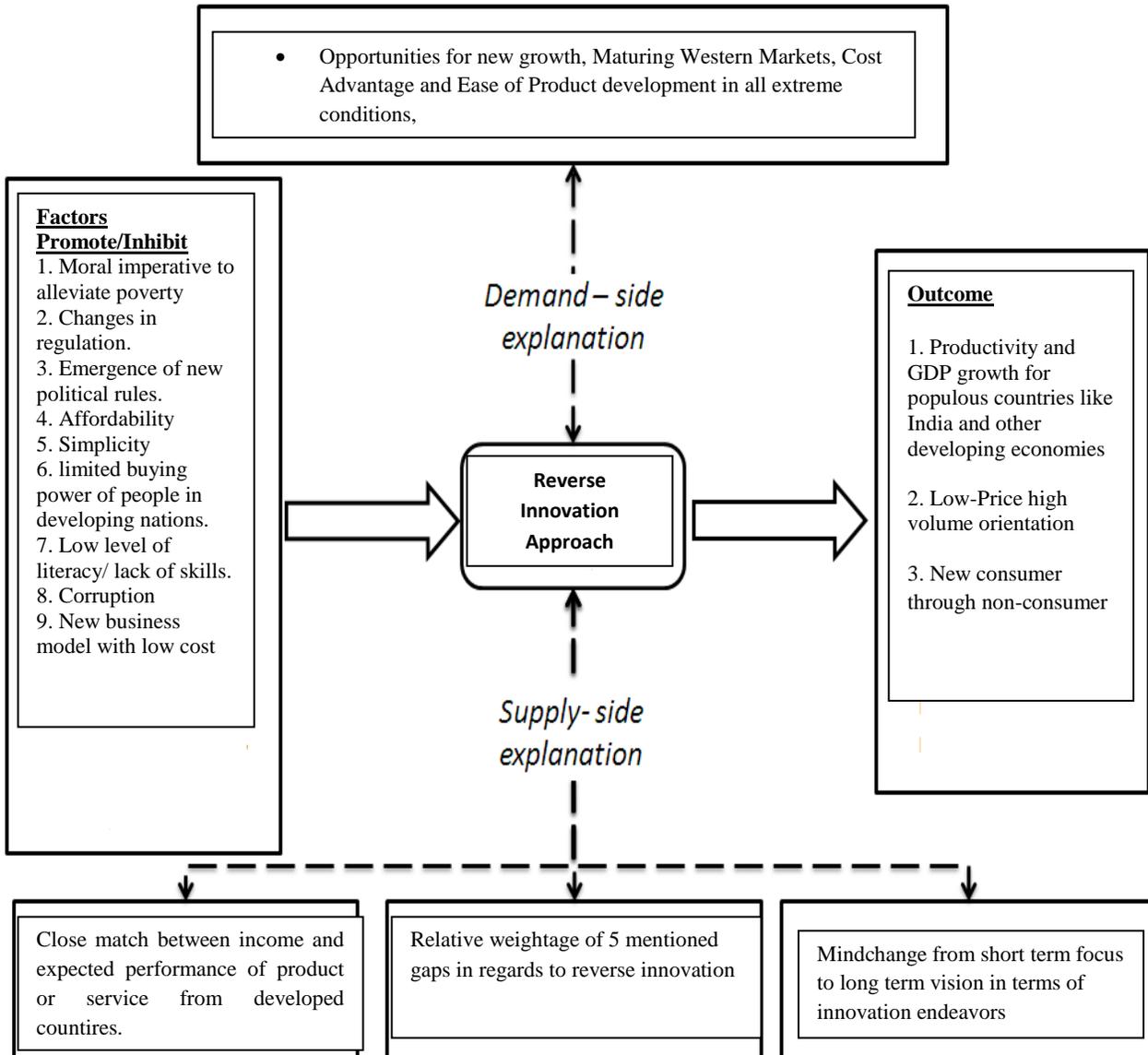## IV.Linkages of Frugal Innovations, Distruptive Innovations and Reverse Innovations.
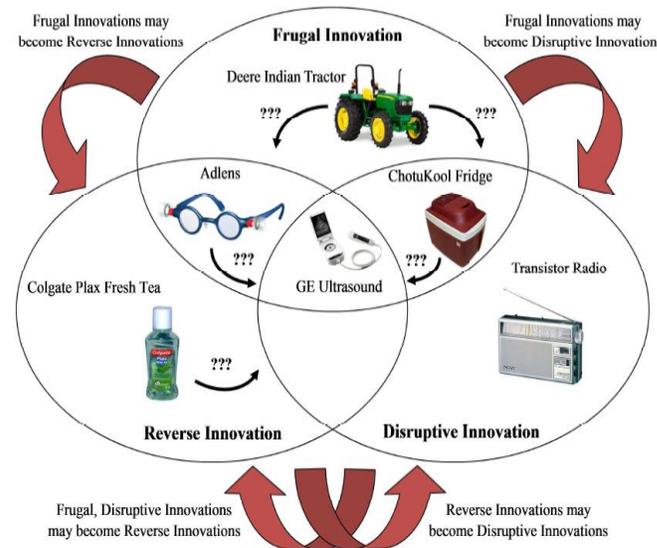
Source : Lee, A., & McNamee, R, (2013) p.36

VI. Discussion and Further Areas of Research

Ideal researching method to study phenomena of 'Reverse Innovation' should be qualitative, blended inductive-deductive approach, formulating propositions derived from the theory base, then testing and modifying those propositions through semi-structured interviews. Content and comparative analysis can then used to draw conclusions. Qualitative research is always preferred when a researcher aims to interpret a phenomenon in a specific like 'Reverse Innovation' rather than simply establishing a link between two variables (Leedy and Ormrod, 2001). Exploratory and qualitative research is also appropriate when enough is not known about a phenomenon for standardized instruments to have been developed (Patton, 2005), and when an ambiguous problem needs to be clarified (Zikmund, 2012). As noted in the literature review, the reverse innovation theory bases has

emerged from a developed world paradigm, and reverse innovation frameworks have not been empirically tested in the low-income market context.

A qualitative, largely exploratory approach is therefore considered most appropriate for this research study.

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│  • Opportunities for new growth, Maturing        │
│    Western Markets, Cost Advantage and Ease of   │
│    Product development in all extreme            │
│    conditions,                                   │
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Factors Promote/Inhibit
1. Moral imperative to alleviate poverty
2. Changes in regulation.
3. Emergence of new political rules.
4. Affordability
5. Simplicity
6. limited buying power of people in developing nations.
7. Low level of literacy/ lack of skills.
8. Corruption
9. New business model with low cost

Demand – side explanation

Reverse Innovation Approach

Supply- side explanation

Outcome

1. Productivity and GDP growth for populous countries like India and other developing economies

2. Low-Price high volume orientation

3. New consumer through non-consumer

| Close match between income and expected performance of product or service from developed countires. | Relative weightage of 5 mentioned gaps in regards to reverse innovation | Mindchange from short term focus to long term vision in terms of innovation endeavors |

*Studying variety of literature and Book "Reverse Innovation –Create far from home win everywhere" By Vijay Govindrajan and Chris Trimple, authors have proposed following conceptual model to be studied further.

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