Conception of the Inductive Reverse Innovation by Developed-Country Multinational Enterprises

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Abstract—**In recent years, international enterprises in developed countries have tended to develop goods on the spot for emerging markets in emerging countries. This has been done in an effort to find cheaper manufacturing routes. However, a recent study on reverse innovation has shown a completely new type of dramatic innovation produced in developing countries 'reversed' to advanced developed markets. The goal of this study is to show the availability and utility of the reverse innovation framework, when employed by developed-country multinational enterprises (DMNEs). First, we explain the theoretical structure of reverse innovation, using previous innovation studies as well as some similar concepts, and hypothesize why and how specific innovations generated in developing countries reverse to developed markets. Second, we proposes a two-type classification system to explain multiple cases of reverse innovations, "Inductive Reverse Innovation (IRI)" and "Coincidental Reverse Innovation (CRI),"- and discuss the characteristics of goods likely to achieve reverse innovation. In order to examine these hypotheses, we interviewed a variety of global Japanese companies, which play an active role in emerging markets. Finally, we also discuss challenges in achieving IRI by developed country enterprises.**

I. INTRODUCTION AND RESEARCH QUESTION

Various studies have been conducted on the relationship between developed and developing countries. However, it is difficult to explain the recent tight connection and complementarity between developed and developing economies, using only the conventional idea of technologies diffusing from the former to the later.

One previous theory, the Flying Geese Paradigm [1], shows the pattern of an emerging country catching up with more developed countries through each process of importing consumer products, manufacturing substitute goods domestically, and finally exporting them. This type of advantaging fits well when considering the growth of Japan after westernization in the late 19th and early 20th centuries. This means that consumer products made in Japan at the time were characterized as simple imitations of advanced country products, and improvements were rap-idly made so as to catch up with the vanguards.

In contrast, consumer goods sold in today's emerging countries, such as China and India, seem to have a distinctive cost-and-quality-cut property. This is why developed-country multi-national enterprises (DMNEs) have had difficulty in the race against local competitors in emerging markets as they have adjusted existing developed-market-goods for developing markets simply by sacrificing some properties to somehow make the goods cheaper, a mode which has been traditionally applied in localization, but it has not been sufficient for competing in today's emerging markets. In view of such circumstances, [2] advocated a new concept of innovation, "reverse innovation."

Recent years, more and more Japanese companies have established their own laboratories for research and development (R&D) in emerging countries in order to learn about local consumers' needs and reflect those needs in newly developed products, and, additionally, to find cheaper ways to manufacture products. For example, Panasonic Corporation launched its China Life-Style Research Center, and has used its Chinese staff to survey the quantitative and qualitative needs of local consumers. Honda Motor Co., Ltd. established Honda Cars India Ltd. (HCIL) in India in order to let Indian staff participate in product planning. Honda also runs laboratories in China, Thailand and Indonesia. Because they already have institutes in emerging countries, these companies are more likely to achieve reverse innovation compared to other companies without such a presence.

Former studies on reverse innovation have obscured the difference between innovation "as a consequence" and "an aim to be pursued." In turn, private enterprises in developed countries might establish laboratories in developing countries with the expectation that there will not only be an effect in the local market, but also a 'reverse' effect in a developed markets. Though reverse innovation has tended to be explained in terms of phenomenology or consequences per se, it is likely that enterprises aim to 'induce' reverse innovation. Based on a series of corporate inter-views, hypothesizing the idea and availability of inductive reverse innovation (IRI) is the central research question of this study.

In this study, we primarily show the merits of reverse innovation when employed by DMNEs. Second, we advocate a two-type classification of reverse innovation: coincidental reverse innovation (CRI) and inductive reverse innovation (IRI), and explain the difference between these two types. In this section, the characteristics of goods that are especially likely to be attained through reverse innovation are also described. In the present study, it is said the problem to be solved is finding out what circumstances reverse innovation is likely to occur, and what differences exist among industries and countries [2].

II. DEFINITION AND FIELD OF REVERSE INNOVATION

A. Three Steps of Reverse Innovation

Govindarajan & Ramamurti [2] have defined three necessary stages for reverse innovations.

Reverse innovation entails at least three stages. The first is adoption of an innovation in one emerging market, such as China or India. The second is the transferring of this innovation to other emerging markets. The third and final step is transferring it selectively to developed-country markets.

Fig. 1 Toshiba Medical Systems' cost –cutting CT scanner

First, in regard to stage 1 which describes the phenomenon that innovations are adopted in emerging countries, we would like to focus on efforts made by Japanese companies. In recent years, Japanese enterprises have tended to develop goods on the spot for emerging countries. Industry analysis [3] explain that this is due to the anticipation of gaining interesting ideas or skills through cooperation with local enterprises and institutes, and of finding good partners when making inroads into markets. It also suggests that this attitude towards developing countries might continue to exist.

There are two possible explanations why DMNEs plan goods in developing countries. The first is that enterprises aim to survey the dynamic needs of emerging markets. At Panasonic's China Life-Style Research Center, for example, there are nine Chinese staff whose primary mission is to discover potential needs in Chinese markets and to develop products to meet these needs. They are responsible for a wide variety of goods: washers, refrigerators, air-conditioners, and since last year, beauty equipment. This task had been performed by Japanese staff, who had to travel from Japan on each such occasion, however, now, the work is done by the Chinese staff who specialize in Chinese markets. This has three advantages: 1) massive and sophisticated surveys can be conducted, which include multiple divisions; 2) information can be shared and cooperation realized among different divisions; and 3) constraints on divisions can be overcome to devise joint solutions. Thanks to such authority, each member of the local staff can take charge and make full use of their innate sense, as a local Chinese, in every step of product planning: brainstorming, researching and testing, concept drafting, department proposals, commodification, and follow-up. They are allowed to visit and listen to their customers, and also are encouraged to come up with unforeseen ideas. DMNEs aim to aggressively collect information about emerging markets' needs by using local staff.

The second reason is the need for low cost development in cooperation with technicians and venders in the emerging nation. This is well suited to manufacturers of medical equipment, automobiles or other such products having the crucial characteristic in that reductions in quality below a certain level are not allowed, no matter how cheap it would be. Ironically, it is necessary to both improve quality and be strong enough to compete in terms of price, because the specifications of these types of consumer goods are often improved within a few years. Toshiba Medical Systems Co., Ltd., develops hardware for their products in the Medical Supply Developing Center in Dalian, China. Orders are placed for development projects by the head office in Japan, and Japanese personnel take command of the highly skilled Chinese employees. This section was established as part of the development allotment in the entire company, and its aim has been to lower product cost while maintaining approximately the same quality. In another example, Toyota Motor Engineering & Manufacturing (China) Co., Ltd., a local subsidiary of Toyota Motor Corporation, started FAW Toyota Research & Development Co., Ltd (FTRD) in 2013. This R&D center is also expected to achieve cost reductions by using components manufactured in China. The development allowed by diversifying material suppliers globally has been explained in the context of open innovation [4], and the framework espoused by Govindarajan can be seen in the previous study.

When verifying stage 1 of reverse innovation with observations of Japanese corporations' effort, it is questionable that the reflection of a higher needs level in the product rather than a simple 'glocalization' [5] is really needed. Govindarajan explains that while DMNEs' globalization for emerging countries is to sacrifice quality in order to cut down on cost, reverse innovation needs to be created from 'white paper' [6]. He describes glocalization as a concept which is the inverse of reverse innovation. However, this is not appropriate for explaining reverse innovation as a social phenomenon. As mentioned above, a struggle to reduce costs can lead DMNEs to emphatically establish R&D institutions. Theoretically, this also could end up becoming reverse innovation, and therefore, Govindarajan's definition of step 1 should be rethought to encompass a broader scope.

The necessity of stage 2 is also doubtful. When innovation, which occurred in a developing market, such as China, is directly reversed to a developed market, such as Japan, there is not likely to be any hesitation in calling this 'reverse innovation,' whether this innovation has an impact on another market, e.g., India, or not. This means that stage 2 is not a requirement for reverse innovation. Therefore, we

rearrange the process of reverse innovation into two phases: phase 1, stopgap innovation, and phase 2, reversing.

Finally, we suggest that assorting in accordance with the existence or nonexistence of DMNEs' approach to phase 1, reverse innovation can be classified into two types, inductive reverse innovation (IRI) and coincidental reverse innovation (CRI). The definition of IRI and CRI will be explained in more detail in Chapter

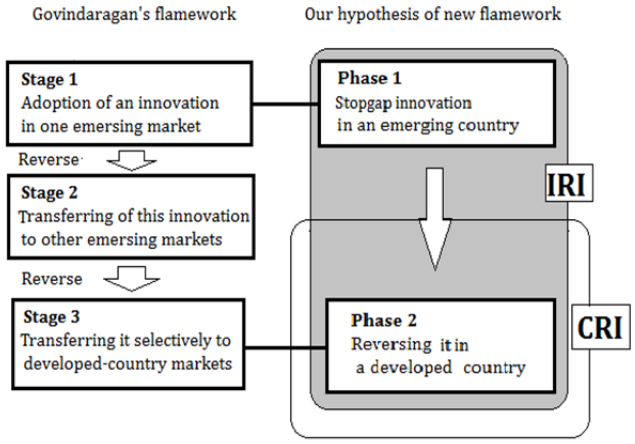

Fig.2 The comparison of reverse innovation flame work

B. Mechanism of Reverse Innovation

In this section, we will explain how reverse innovations takes place, using the 2 phases of reverse innovation mentioned above. Using the previous idea of innovation, we will explain why innovation unique to the emerging market takes place, and what happens when innovation 'reversed.'

1) Phase 1: Stopgap Innovation

What specific properties may be considered to be phase 1? In the former study, emerging countries were sought out as sources of significant innovations.

One is grassroots innovation. This is described as "networks of activists and organizations generating novel bottom–up solutions for sustainable development" [7]. In order to encourage grassroots innovation, India's Department of Science and Technology runs a website "National Innovation Foundation in support of grassroots innovations" [8]. The website introduces innovations such as a bicycle capable of spraying insecticides, a device which captures mosquitos and burning them to death with a solar ray, and a mechanism for taking in laundry when it starts to rain.

A former study [14] shows another example; a pattern of innovations typical in emerging markets, frugal innovation. Frugal innovation is a solution which has a minor impact in improving quality, although it is an adjustment to address a severe regulation of resources by making inexpensive products. Frugal innovation could also be included in innovation particular to emerging markets in phase 1.

Now, what is the essence of these innovations? According to an interview with the CEO of Market Xcel Data Matrix Pvt. Ltd., R. Vishal Oberoi, there are a lot of "devices" in daily life in India, such as combining scrap materials to construct an automobile. In fact, during our inter-view and survey trip, we found a grocery store building in the main bazaar of old Delhi with walls which had been appropriated from adjacent buildings on both sides. Naho Shigeta, managing director of a business consulting company INFOBRIDGE Marketing & Promotions Co., Ltd., suggested in our interview that such devices result from a "stopgap spirit" required particularly in emerging countries where the environment is harsh. Although there is the dis-advantage that products may easily fall into disrepair, it has the strength of being unconventional and making the impossible possible.

Using this terminology, we would like to name the innovations born in such spirit as "stopgap innovations". However, "stopgap spirit" do not directly signify stopgap innovation; an idea will not become an innovation until it is materialized and conquers or changes the market. Some fact shows that not only local entrepreneurs but also some DMNEs have used the "stopgap spirit" in order to develop products which are highly competitive. One famous example is GE Healthcare's innovative mobile electrocardiogram developed in India [6]. Innovation on product processes can also counted in one type of stopgap innovation. For example, according to the interview with some of the leading members of Toshiba Medical systems, the company made a success in constructing an innovative cost-cut assembly method for its CT scanner in an R&D center in Dalian, China. The R&D center was established expecting for their local Chinese staffs to suggest their unique and dynamic solution which Japanese members are hardly to come up with.

2) Phase 2: Reversing

Some of the stopgap innovations can cause "disruptive innovation" when applied in developed markets. Leading reverse innovation is supposed to be an effective solution for DMNEs to overcome "the innovator's dilemma". It is an ironical phenomenon that leading companies evolve techniques monotonously in the tendency of the current main user demand, and become defeated by their competitors with cheap, simple, or in a word, disruptive products in the coming market trend [3].

However, we cannot affirm that all innovation occurring in emerging markets causes disruptive innovations in developed markets. A disruptive innovation presupposes that disruptive technology meets the needs of existing markets [10]. Sometimes, goods which have been developed to meet some customers need in an emerging markets cannot correspond to the needs of the present clientele in developed countries. Toshiba Cricket series LED TV developed by Toshiba India Pvt. Ltd., which specially projects vivid spectacles during cricket's games exemplifies such a case [11]. Such goods which satisfy needs particular to emerging market consumers– and not developed country consumers – may not likely become disruptive innovations in developed markets, even if they are a success in emerging markets.

III. WHAT IS INDUCTIVE REVERSE INNOVATION?

As mentioned before (*Fig*. 2), we would like to define Inductive Reverse Innovation (IRI) as reverse innovation planned in advance and Coincidental Reverse Innovation (CRI) as reverse innovation occurring unexpectedly.

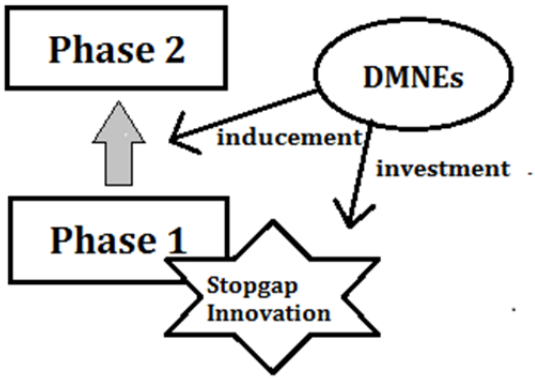

Fig.3 IRI by DMNEs

A reverse innovation planned in advance means that an enterprise choose and targeted one or more emerging countries to establish R&D facility expecting for stopgap innovations to occur, and bring back the appropriate stopgap innovation ideas to the developed markets. In other words, the enterprise should be involved in both of the phase 1 and 2 (*Fig*. 3). Thus, Emerging Nation Domestic Enterprises (ENDEs) theoretically cannot be the subject of IRI, because the place where they generated the stopgap innovations – its home country – was chosen not for an investment expecting stopgap innovations to occur, but just because it was born there.

Some cases can be placed in the category of IRI, such as when a company's head office imposes the task of coming up with goods targeting both emerging markets and developed country markets on a local R&D center in an emerging country, or, a company, which has a global in-formation sharing system, is able to introduce an innovation that originated in an emerging market into a developed market. Needless to say, companies that carry the term "reverse innovation" as a strategy should be counted in IRI. The a company's intention to induce reverse innovation depends on whether it has a mechanism that monitors particular product development, marketing or manufacturing techniques in emerging markets, and picks up good ideas from these. In other words, IRI can be defined as reverse innovation executed by companies having such a proper mechanism.

How can we distinguish IRI from CRI? According to our frame work, we should consider that EMDEs' stopgap innovation which is reversely diffused to developed markets is a type of CRI. Also, many DMNEs develop consumer goods specialized for emerging markets on the spot, using local staffs. When an innovation occurred there and the innovative product brought to developed countries, we should consider that it is CRI done by DMNEs. However, we can clearly examine that the cost-cutting CT scanner developed in China by Toshiba Medical Systems is definitely an example of IRI.

On the other hand, a series of washing machines with the capability to eliminate bacteria and developed by Panasonic's China Life-Style Research Center are an example of CRI. This product was unexpectedly released in Japan on the decision of the Japanese management after its popularity in China. Panasonic did not planned to introduce products developed in China into other emerging markets, nor was there a mechanism for sharing information about localized goods in each country. Therefore, Panasonic's bacteria-eliminating washing machine can be said to be a typical example of a good developed through CRI.

The idea of IRI differs considerably from the previous study made on DMNEs' effort for a global innovation in some points

DMNEs who collect consumers' needs worldwide and reflect them, anticipating for an innovation have been mentioned in the former studied. Christensen shows a global managing system built in Becton Dickinson (BD), an American medical and diagnostic product supplier [12]. BD's method shown in this study is to examine and select local consumers' needs collected by each oversea divisions in a worldwide strategy meeting, and reflected them into their products at R&D department in the U.S. In this reverse innovation this approach shares the idea where reflecting local niche consumers' needs into worldwide products might lead to anticipate the coming global standard. However, because reverse innovation shows innovation born in emerging countries, BD's strategy theoretically differs from reverse innovation in two points. First, emerging-country-born-innovation, explained in the theory of reverse innovation, is not a fruit of advancement in technology but a dynamic paradigm shift of technological combination. Second, multiple steps of trial manufacturing and consumer evaluation on the very spot which consumers' need collected was not done in this case. In this study the concept of reverse innovation can include a series of test marketing activities for the innovation ideas on the very spot, which has not been focused in the former study.

Santos et al [13] shows some companies which are called "metanational innovators" that have managed to collect know-hows and market expertise essential for a successful innovation from markets all over the world. By looking for better or cheaper resources needed for innovation worldwide, an enterprise is more likely to realize innovation of higher value in a lower cost. They claim this business model of metanational innovation will be indispensable for companies.

This approach shares the ideas with reverse innovation in terms of the importance of focusing on multifarious consumer needs in overseas market and the recognition of innovation as not only "technological innovation" but also "new combination of existing technologies.

However, the idea of metanational innovation differs from reverse innovation in two points. One is the difference of how innovation adopted. Metanational innovation is an innovation produced directly by using know-hows and market expertise collected globally, while reverse innovation indicate an innovation initially adopted in emerging countries followed by in developed countries.

Second, although IRI by DMNEs seems to be a type of metanational innovation, it nature is quite different. The concept of metanational innovation thought emphasizes the idea of procurement for innovation, while reverse innovation can be characterized by its investment. Needless to say, it can be said that investing for an uncertain innovation is a higher-risk-action than procuring existing elements. However, we should be skeptical to the optimistic idea of metanational innovation in which DNMEs understand domestic customer needs completely. Considering these facts, IRI seems to be a more robust business strategy than metanational innovation approach, because it is possible to do test marketing in emerging markets before launching the products directly into more complicated unforeseeable developed markets.

A. Categories of Goods Where IRI May Likely Occur

We propose four aspects of goods meriting the reversing mechanism to be continuously monitored: specialty goods, goods requiring global standards of performance, goods requiring an extension of existing techniques, and goods requiring continuous cost-cutting using existing techniques.

Specialty goods are easily accepted among consumers in emerging countries where there is an income level or tastes similar to in developed countries. However, because such consumers in emerging countries are limited, DMNEs selling specialty goods tend to be confined in that small segment. This means that DMNEs have to realize dynamic reductions in order to expand their targets. Specialty goods are often premised on a global standard for performance, and require the extension of existing techniques in response to needs of existing customer as well as a continuous effort to reduce such costs [14].

One example, Toshiba Medical Systems' cost-cutting CT scanner meets all of those characteristics for such goods as follows. The CT scanner is a specialty good used by some medical facilities to provide advanced medical care. CT scanners have been required to realize both dynamic reductions and sufficient quality levels for safety if the DMNE, such as Toshiba Medical Systems, wants its own products to prevail. At this stage, Toshiba Medical Systems focused only on the local need for a dynamic reduction in costs. Therefore, there was still room to address other local needs, such as miniaturization, strength or usability. The broader the range of local needs focused on, the greater the chance the products can be manufactured to satisfy hidden global needs. Other large Japanese manufacturers, such as Toyota Motor Corporation and Honda Motor Co., Ltd., also do not seem to frequently address local needs except for cost reductions, despite having R&D centers in China and India.

Another example, GE Healthcare's small ultrasonic diagnostic equipment developed in Chinese by local personnel and a mobile electrocardiogram (ECG) developed in India by local personnel can meet the following four characteristics of goods. These goods address local needs, not only cost-cutting, but also portability, strengthened usability, augmented battery capacity, and ease of maintenance [14]. Large Japanese manufacturers' cost-cutting can be seen as a step preceding the development of goods by GE Healthcare to meet multiple local needs.

We would also like to consider an endoscope developed by Olympus Corporation. In an interview with Olympus, the company representative said that although they had developed *Axeon*, an endoscope targeted toward emerging markets, it was not successful in target markets. *Axeon* was targeted to town doctors in India, but there were problems. In small towns in India, there is no demand for advanced medical care employing endoscopes. The few doctors who do operate endoscopes do not have sufficient infrastructure for an established maintenance system. Also, it has been said that this endoscope would not be acceptable to doctors in developed countries because image performance is deficient due to cost reductions. In developed countries, one doctor in ten is able to operate an endoscope, so it is natural that there are fewer such doctors in emerging countries. *Axeon* was not suitable for local conditions and needs, so it was not been able to come into widespread use in emerging markets. Endoscopes manufactured by Olympus are goods which potentially possess the four characteristics for realizing IRI. We think the critical issue may be the development location: an R&D facility in a developed country. It seems that the key to Olympus succeeding in emerging markets is developing endoscopes with local staff in emerging countries.

There are likely to be many products which meet these four characteristics for realizing IRI in the medical equipment industry, which means that medical industry has a high potential for realizing reverse innovation. Moreover, there is another reason. Some hospitals even in developed countries have less purchasing power which is similar to hospitals in emerging countries. For example, in United States, some hospitals have little purchasing power as there is a gap in hospital income depending on whether the hospital accepts all or mostly patients with medical insurance and the ability to pay fee or it accepts few such patients. Some hospitals in the United States, which are used by people who do not hold medical insurance policies, have little income and little resources for purchasing expensive medical equipment, as the result, they are not able to offer advanced medical care. There is a demand for medical equipment which resolves some of such difficulties for use in United States as well as in emerging countries.

B. Categories of Goods Where CRI May Likely Occur

We propose two characteristics for goods which are unlikely to be widespread globally: convenience or shopping goods and goods whose tastes and method of use differ depending on the culture or country. Such goods having the following two characteristics tend toward CRI, for example, consumer electrical appliances developed in Panasonic's China Life-Style Research Center.

It is not always necessary to achieve dynamic cost reductions for consumer electrical appliances. Such goods tend to be localized for the particular needs of each locale, which means that it is difficult to introduce such goods into markets in other countries. In the case of a washing machine having bacteria-eliminating capability, which was developed by Panasonic's Chinese employees, this machine reflects the uniquely Chinese sensibility due to severe air pollution. This unique sense about hygiene is the basis for Chinese consumers washing underwear that comes into direct contact with the body by hand because it is inconceivable that a washing machine could perfectly clean such garments with only some detergent. This unique custom gave rise to the idea of developing a machine, which people would believe cleans clothing perfectly. This washing machine has become widespread in China and also has been released in Japan because Japanese customers also want to clean their clothes perfectly. However, the need to use a bacteria-eliminating function for perfect cleaning is unique to China, and Japanese markets where customers have a peculiar sense of hygiene, so market extension of this machine seems limited. Particular needs in each culture and country are not global common needs. Goods which address particular needs are not likely to merit monitoring by a mechanism which would enable such products to be introduced in other country. Thus such goods tend to go through CRI.

IV. FACTORS RESTRICTING REVERSE INNOVATION AND OVERCOMING SUCH FACTORS

When DMNEs plan to induce reverse innovation, they have to consider the following risks.

A. Risk of Cannibalization

When DMNEs introduce an innovative good, which was developed in an emerging market, into a developed country market, the goods may take away from profits earned with existing products. Toshiba Medical Systems has worked to address cannibalization through prudent decision-making in product planning and selecting the appropriate time for introduction. DMNEs need to make such efforts.

B. Risk of Technology Leaks

Research and development in developing countries is likely to lead to technology leaks. Toyota Motor Engineering & Manufacturing (China) Co., Ltd., has been concerned about such risks and found it necessary to take measures to address the situation. To be sure, technology leaks in emerging countries do harm DMNEs. Toshiba Medical Systems carries out manufacturing processes involving core technology not at its Medical Supply Developing Center in Dalian, China but in Japan in order to prevent such risk from arising. In Dalian, China, local engineers have combined core parts made in Japan with other parts made in China. The center handles only generalized techniques which have been used by competitors. However, the company may intensify their efforts to prevent the risk, if the company allocates more roles to the center.

C. Risk of Drain of Human Resources

Risk of draining human resources also damages DMNEs in some emerging countries. In China, there have been many cases where local personnel, who were well trained by a company, quit and changed jobs to work at another company offering better working conditions. Japanese companies have made an effort to prevent such risks with salary increases, localized operations, demonstrated promotion processes, conferring challenging assignments on local personnel and so on. Toshiba India Pvt. Ltd., has been concerned about such risk because the company has plans to employ more local engineers. The company has made an efforts to imbue local workers with company loyalty by offering chances to work in Japan.

V. CONCLUSION

A. DMNEs Should Avail Themselves of IRI

So far, we have explained how DMNE-led IRI operates, using an objective model. In conclusion, we want to suggest the merits of reverse innovation when employed by DMNEs.

First, DMNEs with R&D centers in emerging countries are relatively close to realizing dynamic innovations which cannot be achieved if the R&D stayed inside a developed country. When managed properly, the stopgap spirit, which is an ordinary in specific emerging countries, can be resourced. Drucker [15] points out that anything could be a resource, if its usage is sought, or, in other words, innovation applied. There is no reason to leave such precious re-sources untouched.

Second, IRI can be useful for DMNEs in establishing in-house development allotment systems in order to avoid any destructive innovations possibly produced by up-and-coming competitors. R&D centers in developed countries tend to focus only on the extension of existing techniques. On the other hand, R&D centers in emerging countries can dedicate themselves to developing new and innovative goods required for emerging markets. Traditionally, R&D laboratories in emerging countries have targeted only local customers. However, using the idea of IRI, they can expand the range targeted to customers in developed markets with low purchasing power. As a result, DMNEs can avoid losing some of their customers to an emerging country's low-cost competitors.

Finally, DMNEs have an advantage, compared to emerging country enterprises, in introducing innovations from emerging countries to developed country markets, because they already have a strong brand and adequate marketing channels.

B. Limits and Future Research

There are major three limits to this study to be solved in the future studies.

First, our journey of reverse innovation studies is now just at the initial step, and we have not examined our IRI hypothesis at this point. We should try to examine our hypothesis by using multiple research method in the near future.

Second, there are few examples of reverse innovation, which makes it difficult to sufficiently explain the fundamental reasons behind it. Some examples mentioned above show only situations in China and India, or the actions of Japanese companies. A greater variety of examples is necessary, and these will have to be reexamined.

Finally, "emerging countries" are described as if the stopgap spirit is common. In order to make such an explanation more persuasive, emerging countries should be classified as to whether there is a stopgap spirit or not. Also, in developed country markets, there could be differences of readiness to accept the reversed innovation. Such differences between countries should be considered in future research.

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