Overseas Production and Technology Enhancement:

Case Studies of Japanese Small- and Medium-Sized Enterprise Manufacturers

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Introduction

This text examines how overseas production enables Japan's small-and medium-sized (SME) manufacturers to enhance product and manufacturing technologies. Japan's signature manufacturing industries—automotive, motorcycles, and machinery—are renowned for their competitiveness and advanced technology.

Currently, Japanese SME manufacturers produce more than 30 percent of their output overseas (Japan Bank for International Cooperation 2012), primarily in Eastern and Southeastern Asia (Organization for Small & Medium Enterprises and Regional Innovation, Japan 2013). Global competition is fierce: SMEs compete with not only other Japanese and foreign firms but also local firms in the countries where they relocate (Organization for Small & Medium Enterprises and Regional Innovation, Japan 2013). Technology used by local firms is catching up with Japanese technology, and Japanese SME manufacturers are seeking technological advances.

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Literature Review: Overseas Production from Technological Viewpoint

Though numerous studies investigate technology transfer by multinational corporations, studies before 2000 take a home-centric view wherein technology flows from the parent to the foreign subsidiaries. Some studies adopt the broader view that technology and know-how flow from advanced to developing economies (Ogawa, Kinoshita, and Kishida 1987; Okamoto and Center for Business and Industrial Research 1997). Since 2000, several studies (Ambos, Ambos, and Schlegelmilch 2006; Criscuolo 2009; Zhang, Li, Li, and Zhou 2010; Fang, Wade, Delios, and Beamish 2013; Mudambi, Piscitello, and Rabbiosi 2014) document reverse technology flows—the phenomenon in which technological transfers and knowledge flow from foreign subsidiaries to the parent, augmenting the parent company's competitiveness. Both sets of studies are hierarchical; they view advanced technology as a source of reverse technology transfer and assume that these flows redirect from an upper to a lower.

Wei, Liu, and Wang (2008) analyze an empirical sample of seven local and foreign companies invested in China and conclude that indigenous knowledge enhances parents' productivity. However, they indicate reverse spillovers not between parents and subsidiaries, but among parent firms and external parties including local experts, firms, and universities. We observe intra-firm reverse technology transfer. Only Manimala, and Raju (2012) have appear to have considered intra-firm reverse technology spillovers—from overseas

subsidiaries and less-developed economies to parent companies and more-developed economies. They advocate learning partnerships among equals. We consider that parent companies and foreign subsidiaries have different technologies and share them—but not as superiors in a hierarchy that share with subordinates. Japanese manufacturers who venture abroad often indulge the dated superior–subordinate paradigm. This attitude stifles firm-wide technological progress because continuous, long-term transfers leaven the technological parity between provider and receiver. We argue that Japanese firms must consider leveraging technology through overseas production to generate company-wide advancement.

Case Studies

Table 1 Summary of characteristics of SMEs interviewed[a]

	Nagoya Simitsu Kanagata Ltd. (NSK)	Nanno Sangyo Ltd.（NS)	Ito Seisakusho Ltd. (IS)
Headquarters' Capital	¥38 million	¥10 million	¥50 million
Headquarters' Payroll Number	125	45	47
Establishment of Overseas Subsidiary	Vietnam 2004,Indonesia 2012	China 2003	Philippines 1995,Indonesia 2013
Main Business	Molds for plastic injection	Casting and machine processing	Progressive die and press stamping
Main Customers	Automotive and parts manufactures, Motorcycle and parts manufactures	Machine tools and construction machinery manufactures Automotive and parts manufactures	Automotive and parts manufactures
Competitive Advantage	Precise molds for automotive and motorcycle exterior parts	Precise casting and processing	Progressive dies, low cost and quick delivery press stamping
Enhancement in Product Technology	New and complicated molds were developed.	New and complicated parts were developed.	New dies were developed. New design methodology was developed.
Enhancement in Manufacturing Technology	Production improvement in overseas subsidiary applied to headquarters' plant in Japan.	New Processing method was developed. More sophisticated tracking system was developed.	Production improvement in overseas subsidiary applied to headquarters' plant in Japan.
Interviewee	CEO, Deputy CEO	CEO	CEO, Deputy CEO
Interview Date	Feb 18,2014	Apr 16,2013	Dec 08,2014

[a] For a Japanese manufacturer to be designated as an SME, it must have a capital of ¥300 million or less and employ 300 or fewer

To investigate this premise and empirically clarify factors that maximize the

potential for technology transfer, we conducted face-to-face and semi-structured interviews with ten Japanese SMEs ; however, due to space-related limitations, only three cases are discussed. Table 1 presents the company characteristics and a summary of the interviews. All these companies operate in assembly-type industries such as the automobile, motorcycle, and machine tools industries; Japanese SMEs are competitive in these markets. They started overseas production to reduce labor costs.

Discussion

These case studies explored how Japanese SMEs enhanced product technology and manufacturing technology by producing overseas. Product technology is used to develop and design products with specific characteristics or intended uses, whereas manufacturing technology is used to produce quality products with optimal pricing and delivery times (Grosse 1996, OECD 2005, Erensal, Oncan and Demircan, 2006).

First, all three SMEs establish contact with new customers, which generated improvements in product technology. Generally, Japanese SMEs are tier-2 suppliers and have few customers in Japan, where competition is fierce and new customers are not easily accessible. However, overseas operations can facilitate access to a variety of customers.

Second, even if the needs of new foreign customers parallel those of current customers, potential still exists to enhance manufacturing technology. Overseas production

means operating in different contexts using different materials, machines, and people. It requires SMEs to reconsider their manufacturing processes. Local customers and colleagues may have productivity-improving ideas that Japanese SMEs can use in their home markets.

Conclusion

This analysis has argued that overseas production may help Japanese SME manufacturers enhance technology as well as reduce costs. Initiating overseas operations leads SMEs to customers whose needs require different technology—customers outside Japan in different industries and downstream customers like assemblers. Fulfilling their needs motivates technology enhancements. Certainly, merely executing business with new customers is not enough. Japanese SME manufacturers need to emphasize ideas emerging from overseas subsidiaries. Product development and manufacturing in different contexts broaden SME's application of technology.

The limited research discussed here offers reasonable but inconclusive evidence of relationships between overseas production and technology enhancement. Analysis of a larger sample is needed to establish statistical generality. Nevertheless, our results provide an alternative viewpoint for Japanese SMEs' overseas production. Instead of repeated relocation to pursue cheaper labor, these SMEs should compete internationally using advanced technology.

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