

Offshore R&D Outsourcing in the Context of Global Sourcing and SCM

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Abstract

The purpose of this study is to re-examine whether global sourcing is necessary in the context of large-scale manufacturing back shoring and, if so, why, what, and where to procure it. In this study, I conduct a longitudinal case study of a Japanese company in the machine tool industry that grew from a small to a leading medium-sized firm in the industry by utilizing global sourcing. This case study suggests that by responding with flexible global sourcing, such as offshore sourcing of components, outsourcing of finished machines for the production and sales of complex models in combination with its own machines, and R&D outsourcing, while properly grasping changes in market needs both domestically and internationally and in each country and region, demand in Japan and overseas can expand cyclically through mutual complementation and interaction. To this end, it is considered necessary to have both intra-firm and inter-firm coordination/collaboration relationships with organizations at home and abroad.

Offshoring was considered as one of the main causes of “deindustrialization (industrial hollowing-out)”. In advanced countries, including Japan, it was argued that the overseas expansion of MNCs could lead to a decline in the international competitiveness of domestic industries and the hollowing out of industries. This case study suggests that by responding with flexible global sourcing, such as offshore sourcing of components, outsourcing of finished machines for the production and sale of complex models in combination with its own machines, and R&D outsourcing, while properly grasping changes in market needs both domestically and internationally and in each country and region, demand in Japan and overseas can expand cyclically through mutual complementation and interaction.

Keywords: Global sourcing, R&D outsourcing, Supply Chain Management, Intra- and inter-firm relationships, Collaboration, International business networks

1. Introduction

Faced with a rapidly changing and uncertain economic environment, firms are seeking continuously to create and enhance their capabilities to meet diverse customer needs, of which global sourcing has long been viewed as an essential function impacting overall corporate strategy, other functions, and corporate profitability (Kotabe, 1990; Kotabe & Swan1994). In the recent years, global sourcing, especially the outsourcing of crucial sources of corporate strength and differentiation such as R&D, seems to have begun to play a more important role in corporate strategy than has been previously recognized.

Despite this, little is known about how firms, especially small and medium-sized enterprises (SMEs), have progressed with global sourcing and how this has affected their growth and financial performance. For SMEs, securing profits through sales expansion is a pressing issue for business survival and competitiveness. For example, as large multinational companies such as Toyota and Honda pushed to expand overseas in search of new markets, not only smaller upstream suppliers, but also smaller companies providing machine tools to the automotive industry, such as the companies focused on in this case study, lost access to many contracts and markets. This has forced many SMEs are forced to expand overseas and develop domestic and overseas markets in order to strengthen their sustainable competitive advantage, as the domestic market shrinks, and major suppliers move overseas.

In previous studies, global sourcing is considered an attractive strategy for SMEs to overcome their constrained resources (Lewin, Massini & Peeters, 2009; Rodríguez & Nieto, 2016). In other words, for SMEs that are constantly constrained by their resources, one of the most efficient ways to speedily expand their diverse product lineups to meet customers in different countries and regions is to use global sourcing, including components and R&D. However, academic studies have not sufficiently discussed global sourcing, especially R&D outsourcing.

In view of the growing importance of global sourcing, this study focuses on a Japanese company that has become a mid-size company in its industry by flexibly and beneficially utilizing global sourcing in its overseas expansion, and examines the factors that lead to global sourcing and the cooperation and interaction with partner companies in Japan and overseas in the deployment process. This section discusses the factors that lead to global sourcing and the partnerships and interactions with partner companies in Japan and abroad in the deployment process. Based on previous studies, this section points out the impact of global sourcing on corporate growth and the importance and challenges of building interfirm relationships that significantly affect the process of global sourcing sophistication, from sourcing parts for cost reduction to outsourcing new product development.

With the growing importance of global sourcing in mind, this study examines the factors behind global sourcing and the collaboration and interaction with partner companies in both domestic and overseas markets in the development process through highlighting a Japanese company that has grown from a SME to a major player in its industry by flexibly and beneficially utilizing global sourcing as it expands overseas. This section discusses the factors behind global sourcing, as well as the partnerships and interactions with partner firms in Japan and abroad during the deployment process. Based on previous studies, this section points out the impact of global sourcing on corporate growth, and the importance and challenges of building inter-firm relationships that significantly impact the process of sophistication of global sourcing from parts procurement for the purpose of cost reduction to outsourcing of new product development.

2. Theoretical background

2.1 The definition of global sourcing

Global sourcing is one of the most widely discussed topics in studies with a focus on firms in developed countries. In addition to cost reduction and the utilization of talented local human resources abroad, global sourcing has been widely discussed in regard to access to new technologies and expansion into offshore markets (Christopher, Mena, Khan & Yurt, 2011; Lewin et al., 2009; Steinle & Schiele, 2008). In this section, we first review the deployment process of global sourcing and organize the conceptual framework of this study.

In international business (IB) research, the genesis of global sourcing can be traced back to the overseas expansion (offshoring) of US multinational companies against the backdrop of a strong U.S. dollar. With the expansion of overseas operations, intra-firm transactions among plants cross-borders gradually increased, as parent companies of U.S. multinationals exported parts and products to their overseas plants, and vice versa. As the dollar continued to appreciate in the early 1980s, U.S. multinationals accelerated the sourcing of parts and other items from overseas plants for processing and assembly at their home plants in order to sustain cost competitiveness. Under this context, a series of studies on global sourcing began to examine the interrelationship between multinational firms' overseas sourcing and their international competitiveness in worldwide market shares (Kotabe, 1990; Kotabe & Swan 1994). In these studies focusing on offshoring, global sourcing including offshore insourcing or offshore sourcing was mainly discussed as one of the factors considered in selecting the offshore location of a part of production in the value chain (Kotabe & Swan, 1994).

Subsequently, Western multinational corporations (MCEs) have further strengthened to move production plants overseas and increased their sourcing of parts or/and products

from low-cost countries and regions as the presence of Asian firms has grown and international competition has intensified. In particular, as production moved overseas from the 1990s onward, U.S. MNCs began to actively incorporate the outsourcing of parts and products by their foreign affiliates, thus shifting from internal transactions between home and foreign affiliates to outsourcing and expanding global sourcing. Kotabe & Murray (2004) define global procurement as managing the logistics that determine how each production unit selects the markets in which to offer its products and how the parts needed for production are procured, and the management of the interface between R&D, manufacturing, and marketing on a global scale.

We define the scope of our discussion of global sourcing in this study based on these previous studies. Offshoring and outsourcing are key concepts in global sourcing (Jahns, Hartmann & Bals, 2006; Lewin et al., 2009; Mihalache & Mihalache, 2020). Offshoring refers to the process by which multinational companies relocates some of its activities, such as a part of manufacturing or/and R&D functions, to a country other than their home country, in other words, referred to as overseas expansion (Doh, Bunyaratavej & Hahn, 2009; Kotabe, 1990; Mihalache & Mihalache, 2020; Schmeisser, 2013). As mentioned above, the primary objective in the early stages of offshoring was to reduce production costs. Gradually, parts, products, accounting, software development, and other operations were sourced from their overseas facilities, a process known as offshore insourcing (Contractor, Kumar, Kundu & Pedersen, 2010; Lewin et al., 2009; Nieto & Rodríguez, 2011). Having sourced parts and products from other companies in the countries in which they operate (a process known as offshore outsourcing), many multinational companies are now expanding their sourcing activities by establishing dedicated IPOs (International Purchasing Offices,) that specialize in sourcing parts and materials overseas as global sourcing expands (Nassimbeni & Sartor, 2007; Sartor, Orzes, Nassimbeni, Jia & Lamming, 2014). Outsourcing refers to the purchase of intermediate/finished goods and services from suppliers/providers on a contractual basis by moving activities and tasks such as manufacturing, accounting, and software development to external independent providers, including outsource core activities (Contractor et al., 2010; Ellram, Tate & Billington, 2008; Lahiri, 2016; Lahiri, Karna, Kalubandi & Edacherian, 2022; Rodríguez & Nieto, 2016). As Asian companies in China, India, and other countries improve their manufacturing technology and product quality, many companies in developed countries are sourcing the necessary parts and products from these Asian companies, in other words, outsourcing is becoming more common. In recent years, the number of companies that outsource not only contract out manufacturing, accounting, and other office work, but also some R&D, which is considered to be the core of a company's competitive advantage, to other companies, has been increasing rapidly.

2.2 The roles and challenges of global sourcing

Early studies of U.S. MNCs have shown that increased overseas sourcing by foreign affiliates is positively related to both maintaining global market share and promoting innovation for these firms (Kotabe, 1990). The subsequent decentralization of manufacturing plants on a global scale has greatly accelerated global sourcing activities, either within the same company across borders, such as between home and overseas facilities, or between overseas facilities and independent suppliers. With this shift, the role of global sourcing has evolved from a purely purchasing function to a strategic function in many MNCs, positioning purchasing as part of the process of formulating a company's strategic plan. Global sourcing is considered a strategic decision for companies actively integrate and coordinate common components, parts, processes, designs, technologies, and suppliers across purchasing offices, engineering, and manufacturing locations worldwide (Trent & Monczka, 2002). MNCs can obtain cost benefits from global sourcing, which can contribute significantly to improving overall performance (Narasimhan & Das, 2001).

Global sourcing, on the other hand, faces a variety of challenges, including the difficulty of managing the flow of information and materials across locations on a broader scale and the potential for exposure to environmental factors and risks both within and outside the organization, in addition to cultural and institutional differences resulting from geographic distance (Nassimbeni, 2006; Wagner & Bode, 2008). In addition, while global sourcing often began with the intent of minimizing costs, the cost-minimization model is increasingly being challenged as rising labor costs in emerging Asian economies and the existence of various hidden costs associated with operating cross-border supply chains are highlighted.

In addition, as the outsourcing of manufacturing, accounting and other types of simple clerical work, and software development has spread since 2000, research on global sourcing is increasingly concerned with the establishment of inter-firm relationships (Kotabe & Murray, 2004). The development of long-term relationships with suppliers can lead to greater mutual trust and cooperation, less opportunistic behavior and ultimately lower transaction costs, thereby boosting overall performance (Cousins & Menguc, 2006). Managing communication and relationship building with distant partners from different economic, social and political environments requires that organizations develop a comprehensive set of skills to mitigate these issues. As such, the question of organizations how to build dynamic capabilities to effectively build and manage relationships with partners in the supply chain to gain sustainable competitive advantage is an issue that is attracting many scholars (Handley & Benton, 2013).

On the one hand, in many cases, partnerships in supply chains fail due to different corporate cultures and their complexity, even more so in global sourcing (Ribbink & Grimm, 2014). Offshore outsourcing abroad is vulnerable to the risk of opportunistic behavior of external service providers, oftentimes leading to increased transaction costs that cannot be predicted in advance, known as hidden costs of global sourcing (Holcomb & Hitt 2007; Larsen et al. 2012). Issues and risks associated with global sourcing have also been identified, including the costs of transportation and maintenance, management of distant suppliers, quality, supply chain disruptions and over-sourcing (Cannon & Homburg, 2001; Nassimbeni, 2006).

2.3 R&D outsourcing

In recent years, a growing number of companies have outsourced their R&D activities, that is, global sourcing of R&D (Manning et al., 2008; Nieto & Rodríguez, 2011), to foreign companies, research institutes and universities. A more recent study suggests that offshore outsourcing leads to more positive product and process innovation outcomes compared to domestic outsourcing, especially product innovation (Bertrand & Mol, 2013). They also find that the use of affiliate R&D sourcing, in contrast to offshore outsourcing, does not have a positive impact on product or process innovation. This is because even though the locations are separate, the cognitive distance within the organization is close—that is, there are areas of commonality, such as shared organizational culture and ways of conducting business operations—so that differential knowledge and information from overseas facilities may be limited and have little impact on product innovation outcomes. Outsourcing can promote innovation by combining diverse mindsets and different resources, and R&D outsourcing in particular is considered an attractive strategy for SMEs to overcome limited resources (Rodríguez & Nieto, 2016).

Meanwhile, companies are likely to be more exposed to new risks and hazards in a dynamic business environment, as a result of increased reliance on outsourcing (Oshri, Kotlarsky & Gerbasi, 2015). Moreover, R&D outsourcing is generally characterized as more tacit, complex, and uncertain than outsourcing such as contracting out manufacturing, and has limited formal contracts and controls to mitigate task conflicts, which may increase opportunities for potential opportunistic behavior by providers (Lee et al., 2017; Weigelt, 2009).

As described above, R&D outsourcing and the associated acquisition and utilization of knowledge can complement and strengthen a company's internal competencies and has become an important part of its competitive strategy. Most academic research has focused on Western MNCs in the discussion of global sourcing, but the current state of these studies remains fragmented. In addition, there are little study exists on the drivers and

challenges of global sourcing of products and R&D for small and medium enterprises (SMEs). This study focuses on a Japanese company, TM Corporation, as a case study. The field research was conducted between February 2010 and May 2023. A total of 45 visits were made to TM and its joint ventures, Taiwanese partner and suppliers in mainland China between 2010 and 2023. Ultimately, a total of 63 interviews were conducted, involving 106 interviewees. The interviewees included the founders, presidents, senior managers, engineers, mechanics and advisors of these companies. We clarify how this company's global sourcing has evolved based on these interviews.

3. Case study: the evaluation process of global sourcing

3.1 International expansion and entry strategy in China

Widely known for its high-quality, high-precision, compact computer numerically controlled (CNC) lathes, TM is composed of three business units as of 2023: the machine tool business, which includes the manufacture and sale of lathes, peripheral equipment and collet chucks, accounts for 90% of total sales; IT-related manufacturing equipment accounts for 8%; and automobile parts machining accounts for 2%. Founded in 1948, the company entered the machine tool business in 1961 and now consists of eight overseas sales subsidiaries and four affiliates established jointly with foreign partners, with four manufacturing plants in Japan and three overseas (one in China and two in Thailand). While the Japanese economy as a whole is still in the doldrums of what has been described as 30 lost years, the company's total consolidated sales doubled from 10,667 million yen in fiscal 2003 to 22,650 million yen in fiscal 2018 before COVID19, and the number of employees in its home country of Japan doubled from 290 to 608.

Demand for machine tools is easily affected by domestic and international business trends and fluctuations in economic conditions, with repeated waves of boom-and-bust cycles. In 2009, Japan surrendered its position as the world's leading producer of metal-cutting machine tools, which it had held for 27 consecutive years since 1982, to China, and is now facing fierce competition from the rise of emerging market companies. As TM's main customers are Japanese automotive companies such as Toyota, Subaru, Honda and their suppliers, capital spending trends in the automotive industry have a significant impact on profitability. In addition to the deterioration in business earnings due to the prolonged strength of the yen (from the late 1980s), and the increasing overseas expansion of Japanese companies, TM began establishing overseas sales and service offices overseas in 1996, mainly in the U.S., Germany, Thailand, and Indonesia, where many of its customers had established operations. In particular, in Thailand, where there are many Japanese companies in the automotive industry, TM focused on sales, establishing an assembly plant in 2006 and a joint venture to manufacture automotive parts in 2015. On

the other hand, around the beginning of 2000, automotive-related companies, which are the main customers of machine tools, rapidly increased the number of manufacturing facilities established in China. In December 2004, TM established a manufacturing facility in China in a 50-50 joint venture (TM-China) with a Taiwanese company to meet customer demand, and established sales subsidiaries in Mexico and Vietnam and continues to explore new market opportunities in 2017.

As a result of these efforts, TM's sales have been on an upward trend, except for significant declines in each country and region overall due to the global financial crisis of 2008 and the impact of COVID19 on the global economy in 2020. The timing and intensity of the economic impact on each market varied due to differences in economic conditions and policy responses in each country and region. Although TM's growth has been affected by economic fluctuations in each country and region, overall the Company's growth has been sustained by complementing overseas demand (exports) and domestic demand (sales for domestic demand in Japan) , for example, in 2007, the slump in North America was compensated for by Asia and Europe; from around 2011, the long-term performance slowdown in Europe was supplemented by strong performance in Asia and North America; and around 2015, the decline in orders due to the economic downturn in Asia was complemented by the decline in orders in North America and Japan.

TM's entry into China, in particular, can be regarded as a major turning point that enabled its subsequent dynamic business development. In China, demand for machine tools continues to grow with the country's rapid industrial development, making it the largest consumer and producer of machine tools in 2002. TM's joint venture (TM-China) in China began manufacturing and selling TM-branded CNC lathes in May 2005, and the profit was balanced even in its first year and became profitable in its third year. Until then, although TM had expanded its overseas markets, especially in Europe and the United States, its main customers were Japanese companies operating in those regions. Since the product quality of this Chinese plant is as high as that of the Japanese plant, TM-China has become well known among local Chinese companies, and these local companies are increasingly selling machine tools not only from its Chinese plant, but also from its Japanese plants in China. Due to the booming sales and expected future growth in China, TM saw China as a huge new market and has begun to promote initiatives to meet the needs of local Chinese companies. TM opened a sales office (responsible for importing lathes manufactured at its Japanese factory into China) as an import hub in 2007, and developed into an independent local subsidiary in 2010, and began to build a sales network, strengthening its sales system not only to Japanese companies operating in the country, but also to local companies. By 2015, TM-China's sales in China were split

about 50-50 between Japanese and local companies, allowing it to expand its business despite being a latecomer to the Chinese market.

3.2 Established a global sourcing system with China as the hub

In response to the high costs caused by the appreciation of the yen in the late 1980s, many Japanese companies began to actively expand their local manufacturing overseas. With this trend, there was a growing tendency to increase overseas sourcing of parts and semi-finished products. Furthermore, as production costs continued to rise due to high crude oil and raw material prices from the mid-2000s, many Japanese companies sought to reduce the cost of goods and services through overseas purchasing, and in particular, outsourcing of intermediate goods and services among East Asian countries became more active, resulting in a significant expansion of international trade. In this background, TM's Chinese plant (TM-China) has come to play a role not only as a manufacturing function but also as a hub that handles the global sourcing function, that is, it is responsible for carefully selecting locally purchased parts and supplying them to the home plants in Japan.

The main customers of TM-China, as mentioned above, were local subsidiaries of Japanese companies in the automotive industry. These quality-oriented Japanese companies required the same high quality as made-in-Japan lathes, but at a lower price than made-in-Japan lathes because they were manufactured locally in China. Therefore, it was necessary to build a system that could achieve both quality and price competitiveness, and TM-China, while importing only core parts and components requiring advanced technology from Japan, promoted local sourcing by effectively utilizing the supplier base developed in China by its Taiwanese partner, which established a subsidiary (FFG-China) in China in 1993 and helped some major Taiwanese suppliers expand into China, building the supply base of mainly Taiwanese components. However, the early stages of local sourcing in China proved to be a struggle.

Nevertheless, TM promoted local sourcing, including technical training of local suppliers, to build a system that would enable it to meet the stringent requirements of Japanese companies in China and be competitive in both quality and price. TM-China, as described below, has also introduced and trained this Taiwanese partner's Chinese subsidiary in TPS and has developed it as its (TM-China's) own supplier for machining castings and other parts. Thus, TM-China developed a local sourcing system and achieved a local sourcing ratio of more than 50% from the start of operations to qualify for the Chinese government's tax incentive program.

These efforts were accelerated by the global economic downturn caused by the financial crisis that began in the U.S. in 2008. TM also struggled to improve profitability

by reviewing operating costs and expenses in the face of numerous contract cancellations and the freezing or postponement of confirmed orders. However, the downturn in the economic environment caused its sales to fall sharply, resulting in a decline in sales and profits for the first time in six years in fiscal 2009, and all profit and loss deficits in fiscal 2010. At that time, the Japanese machine tool industry was suffering from a sharp economic downturn, as many of the automotive-related companies that drive the industry curbed capital investment due to a slowdown in the global economy, leading in a sharp decline in domestic demand, while external demand (exports), which had driven the industry as a whole, also fell sharply.

In Japan, on the other hand, low-priced machine tools began to proliferate in the mid-2000s after the bursting of the bubble economy, and this trend has accelerated rapidly since the beginning of 2009 due to price markdowns and the development of low-cost models to halt the sharp decline in orders after the global financial crisis. For example, DMG MORI, one of the world's leading companies in the industry, launched a low-cost model in February 2009 at 5 million yen, about half the price of a similar machine, pushing the industry toward lower prices and further intensifying competition. In January of the same year, TM also lowered the selling price of all its machine tool models by 15% and rushed to develop low-cost strategic machines, and in October, TM launched a new lathe mode with a price 15% lower than that of its mainstay conventional machines while maintaining the same machining accuracy and function.

As it continued to develop low-cost models, TM began to realize the importance of promoting offshore insourcing to reduce costs and sought global sourcing through its production plant in China. At that time, TM-China had been steadily increasing its sales volume, which was evidenced by the fact that its quality was highly regarded by locally-affiliated Japanese companies. Since the range of components that could be sourced from China would be expanded if the local sourcing ratio at its Chinese plant was increased, TM began to support its Chinese plant in developing new suppliers and improving the capacity of its suppliers. Then, TM began efforts to help TM-China increase its local sourcing and improve the capabilities of its overseas suppliers to achieve this goal.

TM sent out an engineer, Mr. Kawagami who had mastered TPS as the general manager of TM-China. He had been stationed in China as a member of the start-up team, and even after returning to headquarters, he was still in a position to be involved with TM-China. Therefore, TM dispatched him again with the expectation that he would deepen cooperation between the Japanese and Chinese facilities and raise the level of local sourcing in China. Since his assignment in the fall of 2008, Mr. Kawagami had been working on introducing TPS to Chinese and Taiwanese suppliers and helping them to improve their technology and productivity, in addition to developing engaging new local

suppliers with TM-China's Taiwanese partner. TM also involved requesting its suppliers in Japan to provide highly specialized technical training to its suppliers in China to help them acquire the technology.

With the promotion of large-scale development projects such as the 2008 Beijing Olympic Games and the 2010 Shanghai World Expo, the demand for machine tools in the Chinese market has been taken into consideration of complexity, diversification and advancement of the technology. The technological capabilities of local Chinese companies have been improving through technical tie-ups and acquisitions with overseas companies that have accumulated technological and development capabilities. TM-China sought to differentiate itself by offering customized machine tools to meet each customer's specific needs in this market environment, which required a new and different approach. TM prompted four of its suppliers in Japan to expand into China in order to improve the level of machine technology at their Chinese plant. Specifically, in 2010, TM pushed for the establishment of two manufacturing plants in China: Asahi, a supplier of CNC devices (CNC controllers and electronic control panels), which are considered the brains of machine tools, and Mecron, a supplier responsible for machining the core components of lathes and FA peripherals. In 2012, TM helped two machined casting suppliers establish a jointly owned company in China.

As these Japanese suppliers were small in size and had no experience of expanding overseas, TM-China supported them in various ways, from legal procedures to setting up factories and selecting employees. In addition to the investment from TM-Japan, TM-China also negotiated with FFG-China to push an investment from FFG, which enabled these core suppliers to enter China in the form of a joint venture through capital participation. (Under Chinese law, companies established with 100% foreign capital, including Taiwanese companies, are entitled to receive preferential treatment including tax breaks.)

In this way, TM-China raised its local sourcing ratio while developing a production system that was able to maintain the same level of quality as in Japan and to improve price competitiveness by realizing source components with high quality and functionality.

As a result of these efforts to foster local suppliers in China and promote Japanese suppliers to enter China, a structure has been established to raise the local sourcing ratio in China to over 60% in terms of monetary amounts in 2015, of which 60% is accounted for by Japanese companies and the remaining 40% by Taiwanese and local Chinese companies. In June 2013, TM's China plant moved to a new location with the same production capacity as the Japanese headquarters plant, and in addition to domestic sales in China, TM has gradually increased production in China by exporting to Southeast Asia

and other regions. The number of lathes produced per month had increased from 30 ((until 2013, 50 units from March 2014)) to 60 at the time of the author's visit in November 2019.

Meanwhile, TM has been working to accelerate coordination links between its domestic and overseas plants and to establish a global sourcing mechanism in order to optimize global sourcing while sustaining and improving the high quality of machines. TM opened a new global sourcing organization at its headquarters in June 2013 to formulate and promote import/export and sourcing strategies among domestic and overseas facilities within the company, and brought Mr. Kawakami, the general manager who had been involved in promoting local sourcing in China and building a supply base system, back to Japan for a year to create a system adapted to global sourcing in Japan. Thus, TM has steadily and selectively increased sourcing from its Chinese plant while reducing imports of components/parts from Japan to its Chinese plant, by giving and taking parts between the Japan-China plants and other locations. In this way, TM-China plays an important role as a global sourcing hub for the entire company, from local sourcing for its own manufacturing activities to involvement in offshore sourcing components and parts for overseas facilities, not only for plants in Japan, but also for assembly plants in Thailand and sales and sales subsidiaries established in other countries as need arises, such as intermediate items, components and other repair parts as well.

4 Evolutionary processes of global sourcing

4.1 Sourcing finished products from domestic and overseas partners to meet the changing demands of the Japanese market

As mentioned above, demand in the Japanese machine tool industry fell to a low level, less than half of its peak, due to the financial crisis in 2008, in addition to lower prices resulting from restrained domestic investment against the backdrop of long-term economic stagnation. After the financial crisis, while the economies of Europe and the U.S. remained sluggish and the recovery of capital investment remained slow, the Japanese economy was also weak, and a wave of further price declines hit the machine tool industry. TM began to seek ways to respond to changes in the domestic market through various partnerships and alliances with domestic and international partners in various forms of cooperation.

4.1.1 Diverse cooperation with the Taiwan partner from import and sale of machining centers to contract production

In May 2008, before the financial crisis, TM began importing and selling large machining centers (MCs) and lathes in Japan through sourcing them from the Taiwanese factory of its joint venture partner in China. As a specialist manufacturer of small precision lathes,

TM was challenged to expand its customer base as it did not manufacture MC or large turning machines. Due to the demand for large models from business discussions with customers, TM decided to respond to this demand by importing and selling MCs made in Taiwan. TM initially set the price at 70% of similar models made in Japan, and the main objective was to increase corporate earnings by retaining existing customers and attracting new ones by expanding the product lineup through import sales as an emergency response. TM unexpectedly received positive reputation from Japanese customers who had refrained from investing in equipment and decided to develop full-scale sales. To expand sales and improve after-sales service, the two companies established their second 50-50 joint venture in Japan in August 2008 to cover a wider range of models, following the establishment of the joint venture in China in 2004. These low-cost models are still in high demand due to the confidence that TM is responsible for the maintenance and management of the machines. In particular, TM regularly receives orders from small and medium-sized Japanese companies for a general-purpose lathe model made in Taiwan, which it recently began importing and selling because it is inexpensive at 3.3 million yen but has sufficient functionality for their needs. In addition, TM was able to win new customers in industries such as construction machinery and shipbuilding outside its main customer base of automotive-related companies, leading to an expansion of sales channels.

As Taiwan-made machine tools have been accepted by quality-conscious Japanese companies, TM has further strengthened its ties with the Taiwanese partner to meet changing domestic needs in Japan. In August 2011, TM commissioned this Taiwanese partner to produce a vertical MC with a proven sales track record in the Taiwanese mold and die industry under its own TM brand, in other words, to outsource the contract production of MCs that it does not manufacture, and developed a precision complex/multi-tasking machining center in combination with its own lathe, and launched it under its own TM brand in the Japanese and overseas markets at a low price, less than half the total price of a single MC and lathe. Of these, 70% were sold to Europe and the U.S., where confidence in the Japanese brand is high, and the remaining 30% were sold in Japan. At that time, the strong yen and weak euro made European products less expensive, and Japanese companies could not survive without producing with competitive prices that could be bought by overseas customers. This complex model has been well received in the domestic and international markets because it combines various cutting methods to improve efficiency and save space due to its compact size.

4.1.2 Cooperation with the German partner deployed from technology licensing in the early years to contract production

TM also launched a dedicated European model in the Japanese market in September 2008. These were complex models that TM combined with its own compact lathes in Japan by outsourcing medium and large vertical lathes or MCs manufactured by EMAG of Germany, with whom it had a technical tie-up for the manufacture of concrete beds in December 1989.

TM established a 50-50 sales company in Japan in September 2003 through a technical alliance with EMAG in the late 1980s, and has been importing and selling EMAG's medium and large models in Japan. TM has taken the lead in expanding sales and service for models manufactured by its German partner, with the goal of increasing its sales through product line expansion. Meanwhile, in Europe, where demand was falling due to the economic recession caused by the financial crisis of the 2000s, there was a shift toward NC machine tools such as multitasking machines, which at the time offered high cost-effectiveness while integrating multiple machining processes on one machine. Japanese machine manufacturers were facing increasingly fierce price competition year after year from up-and-coming Asian competitors. In such a situation, there was an urgent need to formulate a strategy to develop low-priced machines that could sustain profits by thoroughly streamlining design and production while narrowing down the functions of existing models to compete with Asian players such as Korean firms. To meet the growing demand for multitasking machines in Europe, TM developed and launched a model exclusively for the European market in 2007, combining its own compact lathes with EMAG's medium and large vertical lathes and MCs, in an effort to retain customers and attract new ones. In 2008, TM sought to attract new customers outside of its mainstay automotive sector, such as manufacturers of industrial machinery and hydraulic equipment, by selling multi-tasking complex machines that support diversified low-volume production in Japan after a year of successful achievements in the European market.

4.1.3 Partnerships with Japanese companies from a supplier of parts to comrades in developing markets at home and abroad

In parallel with the cooperation with overseas partners, TM launched a complex machine for the domestic market under its own brand in April 2011, combining its own CNC lathe with a small MC sourced from a Japanese company, Mecron. Prices are set about 20% lower than for each machine alone, and the company has begun to work on proposal-based sales, which will enable it to offer automation systems in accordance with customer requirements in combination with the installed machines.

This was the first time that TM decided to outsource production to a domestic competitor. As mentioned above, TM has expanded its model lineup of complex

machines with German-made machines, but there has not been much significant progress in the Japanese market.

TM's mainstay products are CNC lathes, and since more than 80% of its customers in Japan are automotive-related mass production plants, it was urgent to develop new customers in other industries. Therefore, TM has been trying to expand its product lineup by exploring approaches to medical equipment and agricultural machinery, both of which are becoming increasingly popular and valuable in Japan. Mecron, which makes compact MCs and FA peripherals, was similarly seeking to expand its sales channels in the shrinking Japanese market. In this way, TM sought to create new sales by developing new products through cooperation between companies with different areas of expertise.

4.2 R&D outsourcing to improve internal development capabilities

4.2.1 Market shift from developed to emerging markets

Domestic demand for Japanese machine tools had long been stagnant due to the Asian financial crisis of the late 1990s and the recession that followed the bursting of the bubble economy. Since the 2000s, with the rapid expansion of markets in China and other emerging economies, the center of demand for machine tools had begun to shift from developed countries to emerging economies. In addition, although emerging markets were hit by a recession in 2008 as a result of the financial crisis, the pace of demand recovery was relatively rapid, driven by the economic stimulus measures implemented in these countries and, in particular, increased automobile production in China and Thailand. The Japanese machine tool industry, which until then had mainly exported to Europe and the United States, has long enjoyed a good reputation in the global market for mid- to high-end machines. However, with the growing presence of emerging markets and the continuing shift of markets from developed to emerging countries, companies in the industry in Japan are increasingly taking the initiative to expand exports to Asian markets, increase overseas sourcing of parts to reduce costs, and accelerate the development of low-cost models for emerging markets.

As mentioned earlier, TM's Chinese plant has been steadily expanding production as demand has increased due to the entry of Japanese companies into the Chinese market and other factors. In the second half of 2000, TM responded to rising labor costs in China by strengthening sales to local Chinese companies and establishing new sales offices in 2007 to expand its market share in automation systems, a field of expertise in which it specializes. Furthermore, to increase exports, TM established a new wholly-owned sales subsidiary in China in November 2010 to explore demand not only from Japanese companies but also from local Chinese companies. TM promoted a strategy to increase exports by strengthening cooperation with TM-China and its sales office in Thailand,

developing new products for emerging markets, and strengthening local after-sales service and support systems, with particular focus on Thailand, China, and other parts of Asia, resulting in increased orders and sales. As a result of these efforts to meet demand from local companies as well as Japanese companies, TM's Japanese plants also saw a steady increase in orders from China as orders at the Chinese plant increased. In Thailand, where many Japanese automotive companies have operations, capital spending was boosted by increased production of automobiles and motorcycles, as well as demand for reconstruction following the 2011 floods.

As a result of TM's strategy to expand external demand in emerging markets such as Thailand and China, 30% of the company's machine tool sales in 2010 went overseas, of which 80% went to Asia, 10% to Europe and 10% to the US. Exports accounted for more than 50% of TM's sales in 2013, with exports to China growing particularly strong.

4.2.2 Growing dependence on China and risk diversification

Japanese machine tool production had been the world's largest from the early 1980s until 2009, but it fell sharply immediately after the 2008 financial crisis due to a slowdown in capital investment in developed countries, the main customers of Japanese companies, and the top spot was relinquished to China. On the other hand, China has been the world's largest consumer of machine tools since 2002, and it has become the world's largest producer of machine tools since 2009, while at the same time surpassing the U.S. to become the world's largest automobile market. Therefore, among the increasingly important overseas markets for Japanese machine tool manufacturers, there is a growing emphasis on China as the Chinese market has become the largest in the world. In China, since the mid-2000s, prices of machine tools have been rapidly lowered by Asian companies, including local Chinese companies, for example, Taiwanese and Korean models narrow down functions and offer low prices, and European companies, which entered the market in earnest against the backdrop of the weak euro, have intensified price competition in the mid- and high-end machine tool markets by manufacturing locally in China. To narrow the price gap with Asian manufacturers and increase their competitiveness, Japanese machine tool companies have accelerated the development of low-cost, limited-function machines targeted at China and other emerging markets.

TM was also on the offensive with the development of low-cost models in China and other emerging markets. As mentioned earlier, in Japan TM worked to cut the prices of all models on sale in January 2009, and from February, began to engage in cost reduction of existing models by conducting a comprehensive review of its manufacturing costs and production management system and implementing optimized procurement through promoting parts sourcing from China. At the same time, the company began developing

models for China and other emerging markets, and in June developed its first low-cost model, which was initially launched in Thailand to strengthen its business base. By manufacturing in China, TM was able to maintain the same machining precision and performance as its mainstay conventional machines at a price 30% lower than that of its Japanese plant, and in July it began full-scale business negotiations in Thailand for a commercialized compact NC lathe exclusively for Asia. These efforts to introduce lower-priced models were successful, and a recovery in the Asian market was evident. TM then improved its production system based on the Chinese plant by building a new plant with expanded production capacity and increased machine production to supply products to other Asian countries. As mentioned earlier, TM developed a low-cost model for the Japanese market in October 2009. In fact, it was an improved version adapted to the conditions of the Japanese market based on an Asia-specific model developed in June, which combines high precision and low cost by narrowing down the main functions.

In China, foreign automotive companies began to increase their local sourcing ratio in the late 2000s, and as the demand for high-specification automotive parts increased, demands for machine tools that require high machining precision also increased. This intensified competition for mid- to high-end models. The Chinese market, where demand for mid- and high-end models has been gradually increasing, has become a great business opportunity for Japanese companies, which have a technological advantage over Asian companies in these models. Under these circumstances, the low-cost model that TM introduced to the Japanese market in October 2009, as mentioned above, has led to a sharp increase in orders from the home factories of Japanese companies that have expanded into China, as well as from local Chinese companies, where confidence in Japanese products is high, resulting in an expansion of both local production at TM's Chinese plant and its Japanese plants.

As mentioned earlier, the Japanese machine tool industry has become increasingly dependent on the growing Asian market, especially China, in the immediate aftermath of the financial crisis in the fall of 2008, with total exports rising to about 70% of the industry's total sales in 2010, of which about 40% came from Chinese orders. Under these circumstances, as mentioned above, TM also enjoyed a significant recovery in orders in the Asian market, especially in China, where confidence in Japanese products is high, for its improved models that combine high precision and low cost by focusing on key functions. However, in China, a fiscal tightening policy enacted in 2012 has led to a decline in appetite for capital investment in the automotive industry, electrical machinery, and electronics manufacturing services (EMS), which provide contract manufacturing of precision machinery. Subsequently, the Chinese economy slowed again in 2016, and as the risks to the Chinese economy became more apparent, TM, which has experienced the

Chinese economic slowdown twice, began to strengthen its sales and maintenance system by increasing the number of personnel in charge in regions where demand for its mainstay lathes is expected to increase, such as all of Asia and North and Central America, especially for automotive-related applications. In particular, TM added 100 million yen in Thailand as the center of the Southeast Asian market and began to focus on developing markets outside of China.

In Thailand, where many of its customers are Japanese automotive companies, TM already opened a sales office in 1996 and established a sales subsidiary in 2003 before expanding into China. After the Chinese manufacturing facility established in late 2004 got off to a good start, TM was able to make additional investments in Thailand, complete a plant in 2006 for assembling lathes to user specifications to meet user needs, and make additional investments in 2013 to strengthen its sales and service structure and improve its responsiveness. In 2015, TM established a joint venture (74.9% stake) to process auto parts in Thailand, as local sourcing of general-purpose components and further expansion by Japanese companies in the country continues to increase. Strengthening its base in Thailand, TM works to expand sales to neighboring countries such as Indonesia, as well as developing markets in other emerging countries.

4.2.3 International specialization and collaboration in new models of inter- and intra-firm cooperation

With the growing presence of emerging markets around the mid-2000s, there has been a growing trend of shifting the volume zone of the global product market to lower price ranges. The worldwide economy has slowed significantly since the financial crisis of 2008, and new problems have emerged, such as the bipolarization of needs in developed countries, especially in Europe and the United States, where sophistication is advancing, and in Asia, the volume zone. The domestic and international environment of the Japanese machine tool industry has also changed dramatically since the financial crisis, with external demand expanding while domestic demand is sluggish. To stimulate latent demand, TM sought to secure and expand demand in both domestic and overseas markets to provide a product line with specifications suitable for each country/region and user. Specifically, TM has been working to attract new customers by developing products suitable for each market and user, focusing on the development of sophisticated, high-performance models with advanced technology and precision, which is its forte, for developed countries including Japan, as well as high cost-effectiveness models for growing markets, especially in emerging countries.

The process of improving the ability to develop low-cost models, which is not its strength. As it is shown, TM accelerated the development of low-cost models with limited

functions in earnest while orders declined sharply in 2009. At that time, the auto parts industry in Southeast Asia was under pressure to drastically cut costs in response to automakers' shift to smaller compact cars, and amid growing demand for low-cost processing machines, TM launched the G-1 low-cost lathe in the Southeast Asian market in June 2009, based on its own mainstay machine, by reviewing costs. TM targeted local auto parts manufacturers and was able to meet their low-cost requirements by manufacturing in its own Chinese plant and lowering the price by about 30% compared with models made in its own Japanese plant, which have equivalent processing and other capabilities. This low-cost model was first launched in Thailand and then gradually expanded to Malaysia, Indonesia, and other Asian markets. Unexpectedly, it was also well received by Japanese companies entering these countries and was launched in the Japanese market in the fall of the same year.

In 2010, TM also completely redesigned the G-1 model, which was tested in Southeast Asia, and developed the G-2, a low-cost machine for emerging markets in general, to strengthen its business, especially in China and Thailand, which are rapidly recovering from the global financial and economic crisis that occurred in 2008. First of all, China was expected to be in great demand, and as an indispensable market in its overseas strategy, TM established a new sales company in November 2010 to promote sales activities to expand our sales channels. In response to rising labor costs in China, TM has begun to expand its market share by offering automation and labor-saving systems, which are its strengths, and to strengthen its sales channels in China by developing new dealers to provide appropriate services throughout the country. In addition to China and Thailand, for example, in Indonesia where Japanese companies in the motorcycle and automotive industries were expanding into Indonesia due to the high demand for four-wheel vehicles and motorcycles, local sourcing of machine tools and service and maintenance were expected to increase, in other markets, such as India and Vietnam were also expected to increase in economic growth, and TM began to strengthen its expansion into these growing markets to capture the demand.

It was necessary to develop a simpler, easier to use model to meet the Southeast Asian market, especially the growing demand from local companies in the motorcycle parts processing industry. While nearly all CNC lathes in Japan are automated, automation is still not the norm in Thailand (20%), and female workers are increasingly operating machine tools in the factories of automotive suppliers and other companies in Southeast Asia. Recognizing the limitations of developing new models based on an estimate of the cost of manufacturing conventional models, TM outsourced product development to its Taiwanese partner. At the end of 2013, a low-cost basic machine, the G-3, was developed with a simple structure and an emphasis on cost-effectiveness, as well as specifications

that make it easier for female operators to use. Despite its low price of 3.5 million yen, made possible by global sourcing of as many components and parts as possible, but key components are made in Japan, and it has gained popularity. The initial plan was to produce 15 units per month, but within three months of its launch, 150 units had been ordered, it is now one of TM's best-selling models. In this way, TM has promoted the construction of an international role-sharing mechanism, taking advantage of each counter and region's strengths, to emphasize the development and production of high value-added models, while outsourcing the development of new low-priced lathes to overseas parties to develop specifications to match different sales trends in each country / region and to respond to them in a detailed.

In 2016, the company also launched the G-4, a low-cost machine with refined practicality and durability that differentiates it from the existing G-2 machine, on the market globally. TM achieved lower costs for this new model by maintaining durability in anticipation of the working environment of long hours of operation in emerging countries, while focusing on major equipment and components manufactured in its Japanese plants to the greatest extent possible and realizing low costs by taking advantage of optimal global sourcing in cooperation with its Chinese plant. The following year, in 2017, the company launched the G-5, a redesigned G-3 for emerging markets, at 3.8 million yen, with minimal options to achieve low cost and easy introduction for new customers, seeking to expand sales in Southeast Asia and elsewhere. With a focus on cost effectiveness and ease of use, TM has developed the model lineup that the market expects, including software with enhanced safety functions to prevent spillage of defective products and machine damage by preventing automatic operation if the operator does not sufficiently confirm machine conditions or if the machine is in an improperly configured state.

The low-cost lathes TM has developed for the Southeast Asian market have been well received and sold well by local parts manufacturers and others, as expected since prices are kept low by manufacturing in the Chinese plant, and local sales in Thailand reached a record high in 2017. With the experience gained from outsourcing the development of new models for these emerging markets and the associated expansion of global sourcing of components, TM launched a series of internally developed new models in 2018 that are more compact and have higher performance than previous models, while also being environmentally friendly as carbon neutrality and energy saving initiatives accelerate in the Japanese market, and especially launched a new model at half the price while maintaining the performance of a similar model in 2019. As described above, TM has responded to the changing external environment in the machine tool business and worked to secure demand by exploring new markets in Japan and abroad, strengthening overseas

expansion, and developing new models in a flexible and timely manner. In this way, TM has promoted cooperation among production and sales bases within the company, while outsourcing the development of new low-cost lathes overseas, utilizing the strengths of its business partners based on the long-term inter-firm relationships it has established, in other words, TM has established an international role-sharing mechanism between inter- and intra-firm relationships.

5. Finding and discussion

The first finding from the case study is that TM has promoted global sourcing according to its own stage of development and the needs of domestic and overseas markets, ranging from sourcing components from China, outsourcing manufacturing to domestic and overseas partners in the same industry in Taiwan, Germany, and Japan for models that it does not manufacture itself, to outsourcing R&D to a Taiwanese partner in the form of developing new models for emerging markets. The first finding from the case study is that TM has promoted global sourcing according to its own stage of development and the needs of domestic and overseas markets, ranging from sourcing components from China, outsourcing manufacturing to domestic and overseas partners in the same industry in Taiwan, Germany, and Japan for models that it does not manufacture itself, to outsourcing R&D to its Taiwanese partner in the form of developing new models for emerging markets. As a result of these efforts, while the Japanese machine tool industry as a whole has been severely affected by economic fluctuations in demand, TM has achieved substantial growth and generally increased sales from 2010 to 2019, despite negative growth in 2009 in the immediate aftermath of the financial crisis that had a significant negative impact on the global economy. Previous studies have focused primarily on cost reduction and the use of talented overseas human resources, but there has been little discussion of how companies can promote global sourcing in the context of growth processes and changes in the external environment. This study contributes to the advancement of the global sourcing debate by focusing on an SME with sustained growth as a case study and examining the evolution of its offshore sourcing of components, products, and R&D outsourcing over time.

The second finding was that TM's global sourcing leverages domestic and external market demand to complement and drive each other, supporting sustainable growth through cyclical expansion of both. In the case study, TM set up a local plant as a joint venture to meet the expectations of Japanese companies entering the Chinese market. This Chinese plant also saw an increase in orders from local companies seeking high quality, and as the needs in China became more sophisticated, there was a ripple effect that expanded sales to high-end models at the Japanese plant. TM saw its entry into the

Chinese market, the largest consumer of machine tools, as an opportunity, and as local manufacturing continued to expand, it strengthened its system for selling machinery imported from Japan, including the establishment of sales companies, and expanded external demand for its Japanese plants. As a result, while demand in Japan declined sharply after the financial crisis, orders from the growing Asian market, especially China, reached a record high in fiscal 2010 and became a driving force, accounting for about 60% of TM's overseas demand.

On the other hand, TM has continued to develop new models in Japan to allow an enclosure of customers and explore new markets, while strengthening its response to overseas markets, which are driving demand in the machine tool industry as a whole. To this end, TM formed various alliances with domestic and foreign companies to meet fluctuating demand, and complemented its own product lineup by importing and selling MC and large lathes that it did not own, which it obtained from its alliance partners, and by developing complex machines that combined models from contract manufacturing and its own lathes. Thus, global sourcing provides a high degree of flexibility, which has allowed TM to increase profitability through a complex complementary lineup of models that leverage the mutual strengths its own and business partners.

Through these alliances, TMs acquired knowledge about different models while deepening cooperation and relationships among these companies, which may have led to its subsequent decision to boldly outsource R&D of new models for emerging markets to its Taiwanese alliance partner, abandoning its pride in its advanced technology development capabilities. Relatedly, the third finding revealed that TM has increased profitability by outsourcing R&D of new models for emerging markets to its Taiwanese partner, resulting in shorter time-to-market and gaining market share ahead of the competition. In this case, TM, which had been developing machines mainly for users in developed countries, found it difficult to win orders from local companies because the low-priced models it had developed for Southeast Asia shortly after the 2008 financial crisis were only 70% of the price of those made at its own Japanese plants price, even when manufactured at its Chinese plant. This meant that while it was necessary to drastically change the mindset and approach to the development of truly low-cost models, the existing Japanese supplier base that had been used until then was also a constraint, making it difficult to develop products that would be readily accepted in the local market. Therefore, in order to increase its competitive advantage by timely launching low-cost models that local companies could easily accept, TM outsourced the R&D of these new models to its Taiwanese partner, enabling it to respond quickly to market changes and new customers. In this way, TM's progress in global sourcing is considered to have contributed to its significant growth after the 2008 financial crisis by reacting to changes

in existing markets at home and abroad, as well as quickly exploring to newly emerging growth markets overseas, and by taking the proactive aggressive approach.

Using foreign suppliers that are geographically and culturally distant can also present risks and challenges, such as cultural differences in language and business practices, as well as institutional and communication barriers that make it more difficult to manage suppliers over distance (Wagner & Bode, 2008). It suggests that R&D outsourcing is a tool to reduce the complexity of restructuring and integrating domestic and foreign suppliers and to make timely and effective use of the overseas supplier base in order to respond quickly to today's uncertain and rapidly changing economic environment. It is assumed that TM has been able to further expand its global sourcing by utilizing the overseas supplier base which it has used through R&D outsourcing, and that this in turn has led to subsequent improvements in its own development capabilities for low-cost models at its headquarters in Japan (as shown in Figure 4-2-3).

As the final finding, TM's consistent coordination and cooperation between its Japanese and overseas manufacturing and sales operations has proved to be an important factor that has enabled it to expand sales in both domestic and overseas demand, and to foster collaborative and complementary relationships with its partners in Japan and abroad, and to enable the international inter-firm role-sharing mechanism in the international business networks it has built. According to the case study, TM has facilitated an increase in the local sourcing rate and sophistication of its Chinese plant, while at the same time enabling the development of low-cost models at its Japanese plant, as component sourcing from China has expanded to meet the Japanese market's need for low-cost models. As shown in the case study, TM initially simply responded to the obligatory local sourcing rate, but in order to differentiate itself from the rising Asian players, it encouraged its core suppliers in Japan to expand into China, increasing the volume of local sourcing and improving the quality of component. In addition, as demand in China became more sophisticated and labor costs soared, the high-quality models produced at its Chinese plant differentiated themselves from the competition and increased brand recognition, which led to an increase in exports of high-end models from its home plants to China, and eventually increased production at the domestic plant in Japan.

On the other hand, TM has contributed to the expansion and sophistication of local sourcing at the Chinese plant, while the expansion of components sourced from China has enabled the Japanese plant to develop products that are both compact and high-performance, as well as environmentally friendly, all at low cost. Thus, many small and medium-sized companies were forced into bankruptcy as demand plummeted in Japan and abroad due to the global recession in the fall of 2008. Although TM did not have the

financial strength of industry leader DMG MORI, it was able not only to overcome its difficulties but also to achieve growth by steadily improving its ability to develop low-cost models not merely cost reviews and cost cutting, but additionally by strengthening global sourcing with its Chinese plant as the herb of choice. Most previous studies have focused on the role of offshore sourcing centers, such as IPOs, and there has been insufficient consideration of the coordination and interaction between domestic and offshore facilities. This case study suggests that cooperation and interaction among facilities within a company can contribute to the strategic development and enhancement of global sourcing.

5. Conclusions and Implications for Managerial Practice

In recent years, global sourcing has expanded to maintain and improve international competitiveness, and interest in its functions and strategic importance has grown. There is a lack of academic research on global sourcing in Japanese companies, and previous studies have mainly focused on Western companies. This study is a case study of a Japanese company that saw an opportunity to expand into overseas markets and develop its business and grew from an SME to a competitive and high-profile player in its industry, while flexibly and effectively utilizing global sourcing. Offshoring was considered as one of the main causes of “deindustrialization (industrial hollowing-out)”. In advanced countries, including Japan, it was argued that the overseas expansion of MNCs could lead to a decline in the international competitiveness of domestic industries and the hollowing out of industries. This case study suggests that by responding with flexible global sourcing, such as offshore sourcing of components, outsourcing of finished machines for the production and sale of complex models in combination with its own machines, and R&D outsourcing, while properly grasping changes in market needs both domestically and internationally and in each country and region, demand in Japan and overseas can expand cyclically through mutual complementation and interaction.

We would also suggest that in order to effectively promote global sourcing, it is important to take the time to build the various cooperative relationships with different domestic and foreign companies as needed so that a wide variety of collaborations can be timely conducted. In particular, SMEs that lack sufficient management resources, such as financial resources, overseas business experience, and human resources, may be expected to make strategic efforts to build cooperative business relationships in order to make effective use of necessary external resources. As companies realize new products and innovations for diverse international markets, they can achieve this through the combination of diverse knowledge (Golovko & Valentini, 2011). In recent years, an increasing number of companies have outsourced their R&D activities to offshore

locations, breaking away from the traditional practice of conducting innovation and R&D in their own countries and under their own internal corporate governance. In this study, we show that R&D outsourcing is not only an option to temporarily accelerate development to timely meet changing market needs, but also an effective way to complement and enhance in-house R&D. This is because if the market accepts the quality of the new product developed by the R&D outsourcing partner, the requesting company will be able to utilize the offshore supplier base, which allows it to make effective use of external resources and capabilities by having its partner take the burden of seeking new offshore suppliers for it. R&D outsourcing has cost and speed advantages, but more importantly, it provides access to expertise and resources not available in-house, such as capabilities related to specific product development.

In the future, as companies complement each other with their areas of expertise and strengths around the world, global sourcing is considered to be a trend that is expected to expand, not to mention offshore sourcing of components, outsourcing of manufacturing of finished products to outside firms, and outsourcing of R&D, which is said to be a company's core competitive advantage. Promoting global sourcing can be a means of overcoming resource constraints in today's intensely competitive marketplace. The development of inter-firm relationships for the capture and utilization of necessary resources is now an important part of the competitive strategy. Access to and effective utilization of diverse and specialized knowledge is considered an attractive strategy to overcome limited resources, especially for SMEs. Finally, this case studies suggest the necessity of cooperation within intra-firm operations located at home and abroad to link the growth of external demand from overseas economic growth to domestic demand and to pursue strategic inter-firm partnerships for collaboration with external firms. In short, both intra- and inter-firm cooperative relationships are considered necessary for the improvement of global sourcing performance.

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