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Exploiting Linkages for Building Technological Capabilities

Vietnam's Motorcycle Component Suppliers Under Japanese and Chinese Influence

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Preface

In July 2001, I was standing alone in Cho Lon (Chinatown) in Ho Chi Minh City, trying to figure out how I could possibly cross the street to the other side. The streets were filled with loads of cheap "Chinese motorcycles" running right and left. Recalling my previous visit in December 1999, when the streets were still quiet, I realised the city's landscape had been completely transformed in a matter of a few years.

It was not only the urban landscape that had changed so dramatically. What intrigued me even further was the remarkable transformation taking place on the production side. Contrary to the widely received view in the 1990s that industries in Vietnam were largely stagnant, massive inflows of cheap Chinese motorcycle components in the early 2000s had initiated chains of dynamic development—entry of numerous Vietnamese motorcycle assemblers, counter-attacks by incumbent Japanese motorcycle manufacturers launching low-priced models and the rise of local suppliers. A year later, I returned to Vietnam for a two-week fieldwork to study about this industry. And somewhat unexpectedly, my exploration of this industry went on for a decade—including the five years (2007–2012) it took me to develop this research into a PhD thesis at the University of Sussex.

This book is a product of my decade-long exploration of this industry. It tells the story of how small-scale developing country suppliers of parts and components starting at the bottom of the technological ladder upgrade their technological capabilities over time. The key to understanding such processes and mechanisms lies in the dynamics of industrial transformation discussed above—entry of new manufacturers and assemblers as lead firms and their strategic responses to the changing competitive and policy environment, combined with the active entrepreneurship and endeavours of the suppliers themselves. On the basis of historical evidence and recent empirical data collected through repeated rounds of in-depth fieldwork, this book not only provides dynamic and insightful accounts of supplier learning in a developing country context but also makes key theoretical and methodological contributions to the research on value chain participation and supplier learning.

This book would not have been possible without the intellectual, financial and practical support of numerous organisations and individuals. Intellectually, I am deeply indebted to my PhD supervisor, Hubert Schmitz, for encouraging me to develop my research into a PhD project and providing invaluable guidance

throughout the research process. Many thanks are due to my colleagues in Japan, including Yuri Sato, Moriki Ohara, Jun Otahara, Yukihito Sato, Shigeki Higashi, Yoshie Shimane, Momoko Kawakami, Ken Imai, Hiroshi Oikawa, Takahiro Fukunishi, Mariko Watanabe, Ding Ke, Tomohiro Machikita, Kenta Goto, Koji Kubo and Akie Ishida. They have commented on my research on numerous occasions, and I have learned greatly from my interaction with them, which has been of tremendous help and enriched my work. Comments and suggestions by John Humphrey, Timothy Sturgeon, Martin Bell, Rasmus Lema and Patarapong Intarakumnerd are also gratefully acknowledged.

The Institute of Developing Economies has sponsored several projects which provide essential empirical inputs for this research. The Japan Society for Promotion of Science (JSPS) provided funding for the research projects 'Assembler–Supplier Relationship and the Growth of Local Suppliers in the Vietnamese Motorcycle Industry' (project number 20510243, fiscal years 2008–2010) and 'Analysis of Developing Country Markets and Industrial Development using the Structural Estimation Approach: The Case of the Motorcycle Industry in Southeast Asia' (project number 24310191, fiscal years 2012–2015), which made the extensive fieldwork for this research possible.

The fieldwork in Vietnam has been a vital part of this research. My deepest appreciation goes to the managers, engineers and other staff members of the motorcycle manufacturers and component suppliers who kindly spared their precious time to share their insights, knowledge and experiences with me. My thanks are also due to colleagues and friends who kindly supported numerous interviews and surveys in Vietnam: Ha Huy Thanh, Cu Chi Loi, Bui Tat Thang, Vu Hung Cuong, Dao Thi Hoang Mai and Tran Thanh Phuong at the Vietnam Institute of Economics, Vietnam Academy of Social Science and Pham Truong Hoang and Ha Tung at the National Economic University in Hanoi. I would also like to thank Le Thanh Thuy, Nguyen Thi Thanh Hai, Nguyen Duong Lieu and Vu Dieu Linh for transcribing numerous interview recordings.

Lastly, I would like to thank my family for their support, generosity and patience, without which I would not have been able to manage numerous field trips, the long write-up process and all the ups and downs of this extended research.

July 2013 Mai Fujita

Contents

Acronyms

ASEAN	Association of Southeast Asian Nations
CNC	Computer Numerically Controlled
FDI	Foreign Direct Investment
GVC	Global Value Chain
HVN	Honda Vietnam
ISO	International Organization for Standardization
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
QCD	Quality, Costs and Delivery
R&D	Research and Development
SOE	State-owned Enterprise
TC	Technological Capability
TNC	Transnational Corporation
UNCTAD	United Nations Conference on Trade and Development
USSR	Union of Soviet Socialist Republic
VEAM	Vietnam Engine and Agricultural Machinery Corporation
VMEP	Vietnam Manufacturing and Export Processing Co., Ltd.
WTO	World Trade Organisation
YVN	Yamaha Vietnam

Chapter 1
Introduction

Abstract For countries seeking to build internationally competitive industries, it is vital to develop a sizeable pool of competent suppliers of parts, components and accessories. However, building key competencies remains a formidable challenge for developing country firms as it requires an extended process of continuous learning. This book looks into the processes and mechanisms by which firms in developing countries acquire key capabilities over an extended period of time by engaging in an in-depth longitudinal analysis of the motorcycle industry in Vietnam.

Keywords Suppliers · Capability building · Longitudinal analysis · Motorcycle industry · Vietnam

One of the key ingredients of success in building internationally competitive industries lies in amassing a sizeable pool of competent suppliers of parts, components and accessories. Among developed countries, it has been well documented how the rise of major Japanese carmakers and electronics manufacturers by the 1980s was assisted by tightly integrated networks of competent suppliers working closely with the manufacturers in designing and/or manufacturing key components and parts (Asanuma 1989; Nishiguchi 1994; Fujimoto 1999). As regards latecomer countries in East Asia, firms in countries like Taiwan, Korea and Hong Kong took advantage of participation in international production networks developed by major transnational corporations (TNCs) from developed countries to acquire key competencies (Hobday 1995a, b; Ernst and Kim 2002). Active strategies, internal efforts and investments aimed at accumulation of high-level capabilities enabled some of these firms to eventually upgrade themselves to manufacture increasingly sophisticated products, take on additional functions like product and process design, or even launch products carrying their own brand names (Hobday 1995a, b). They became the key drivers of industrial upgrading in these countries.

Today, building a substantial domestic component manufacturing base remains one of the major challenges for developing countries. Having a substantial domestic agglomeration of suppliers equipped with high levels of manufacturing and design competencies helps a developing country not only to increase the value

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added that accrues within the country but also to raise the competitive performance of manufacturers, both domestic and foreign, located in the country. A well-developed component supply base is also a key to attracting growing foreign direct investment (FDI), as agglomeration economies significantly influence location decisions of TNCs (UNCTAD 2001).

Nevertheless, building key competencies is by no means a simple task as it requires an extended process of continuous learning. The challenges of capability building are particularly acute for developing country firms at the lowest end of the technological ladder. These firms typically start their business by serving their domestic consumers, which they might manage with inexperienced management, limited human resources and outdated equipment. However, as firms grow, they naturally try to exploit new business opportunities—such as keeping up with the sophistication of domestic demand or developing linkages with global buyers. Such tasks typically call for new sets of technology and skills that are experience-based, cumulative and specific to products and contexts. Developing country firms therefore need to go through extended processes of accumulating knowledge-based assets that are referred to as *capabilities* (Bell and Pavitt 1995, 1997; Lall 1992).

Until now, a growing literature has looked into the processes and mechanisms by which firms in developing countries acquire key capabilities. Despite the growing research in this field, the following two interrelated research agendas remain underexplored. The first concerns the question of how supplier learning evolves over time. To date, much of the empirical research on capability building of small-scale suppliers has been based on short-term observation. In other words, research has focused primarily on showing the capability levels that firms had reached at a particular point in time, or the progress in learning that they had made in the period immediately preceding a study. As a result, the questions of what critical junctures developing country suppliers experience in the process of capability building, how they manage to overcome them, and how the overall capability building trajectories evolve over an extended period largely remain underexplored. Given that suppliers typically undertake continuous learning over an extended period of time, this is a serious omission.

The second agenda concerns the mechanisms by which suppliers acquire new capabilities. The conventional literature focused on the deliberate and managed efforts made by the firms themselves to absorb, adapt and improve on the technology. More recently, increasing emphasis has come to be directed towards the inter-firm, network-based nature of the learning process in which actors external to the firms play key roles as providers of various types of knowledge, such as customers and traders, suppliers of materials, subcontractors, machinery providers, business associations, and research institutes and universities. Clearly, the firm-internal processes and knowledge flows from external actors are by no means mutually exclusive; they have complementary roles to play in determining suppliers' learning. However, limited attempts have been made to integrate the two perspectives for developing a comprehensive understanding of the mechanism of supplier learning. It remains an open question as to how suppliers combine internal

efforts with the knowledge sourced from other firm or non-firm actors to promote accumulation of their capabilities.

This book explores the two aforementioned underexplored research problems by engaging in an in-depth longitudinal analysis of the motorcycle industry in Vietnam. Small-displacement motorcycles[1] are a popular means of daily transport in low-income countries where private cars are still beyond the reach of most citizens. Looking back at history, Japan experienced a motorcycle boom in the 1950s and 1960s. Starting from intense competition between more than one hundred companies producing motorcycles or motorised bicycles that imitate models imported from Europe, the industry saw the emergence of four major motorcycle manufacturers, which eventually developed into the global industry leaders (Alexander 2008; Demizu 1991, 2005; Otahara 2000, 2005; Tomizuka 2001). By the 1970s and 1980s, the motorcycle boom shifted to Taiwan, and currently, countries like China, Thailand, Indonesia and India are experiencing one (Sato 1999; Ohara 2001, 2005, 2006; Higashi 2006; Sato 2006, 2011).

Motorcycles are made up of approximately 2,000–3,000 components requiring a variety of technologies to process steel, aluminium, plastics, rubber, and other materials. Given that such a large variety of components cannot possibly be made in-house by a single motorcycle manufacturer, developing networks of firms with the capacity to provide a stable and timely supply of high-quality parts and components at competitive prices is critical for manufacturers to stay competitive in this industry. Moreover, compared to cars, the relative simplicity of the product and the smaller number of components required makes motorcycles and their components technologically easier to manufacture—even for firms in developing countries (Otahara 2006). These features make the motorcycle industry particularly appropriate for studying the processes and mechanisms of capability building in suppliers in developing countries.

Indeed, domestic motorcycle manufacturers and suppliers have played leading roles in motorcycle industries in Taiwan and China (Sato 1999; Ohara 2001, 2006). Whilst Japanese motorcycle manufactures have maintained dominant positions in Thailand and Indonesia, even these countries have witnessed the rise of local component manufacturers amassing substantial production capabilities via serving Japanese lead firms (Higashi 2006; Sato 2011).

Among countries in Asia, Vietnam was one of the latest comers in establishing the domestic production of motorcycles. When production of motorcycles started in Vietnam in the mid-1990s, the prospects for development seemed weak. Foreign motorcycle manufacturers produced small quantities of high-priced, sophisticated models shielded by heavy protection from imports, and so Vietnam's prospects for competing internationally in this industry appeared limited.

[1] Whilst there is no specific line between small- and large-displacement motorcycles, motorcycles of displacement up to 125 cc account for the bulk of motorcycle sales in developing countries in Asia.

However, as early as 2006, that is, in less than a decade after the start of domestic production, the country emerged as one of the world's major motorcycle markets and producers, following only China, India and Indonesia.[2] Motorcycle manufacturers of different nationalities competed fiercely to gain increasing shares in the growing market consisting of demanding consumers, contributing to lower prices, improved product quality and larger product variety (The Motorbike Joint Working Group 2007; Fujita 2011).

Moreover, whilst the Vietnamese motorcycle industry has essentially followed an import-substituting path to development, Honda announced in 2012 that the company would make Vietnam, along with Thailand, its base for exporting high-end motorcycles to developed country markets (*The Nikkan Kogyo Shimbun* 2012). This is particularly noteworthy because it is rare to find an import-substituting industry that becomes internationally competitive in only 15 years.

The rapid growth of the industry has also been accompanied by the formation of a substantial component supply base. In the early days, the country was equipped with an extremely limited mechanical industrial base. However, by around 2005, the local content ratios of foreign motorcycle manufacturers had exceeded 90 % (The Motorbike Joint Working Group 2007). Whilst the supply base consisted of a large number of foreign component suppliers, especially from Japan and Taiwan, a large number of Vietnamese state-owned and private firms also played important roles (Nguyen 2004; Ha et al. 2003; Fujita 2011, 2012). Among them were successful local suppliers that became important partners with major foreign motorcycle manufacturers. A few of them even acquired sophisticated production-related capabilities for operating processing lines for high-precision engine components for foreign motorcycle manufacturers—a remarkable achievement for local firms in a developing country with a limited industrial foundation.

Why was the Vietnamese motorcycle industry able to develop and nurture the domestic component supply base in such a short period of time? The key to resolving the apparent puzzle lies in the fact that the development of this industry was driven by competition between two types of motorcycle manufacturers or assemblers exhibiting contrasting types of competitiveness and developing different styles of industrial organisation, which originated from Japan and China, respectively (Fujita 2013a, b).

On the one hand, Japanese motorcycle manufacturers used long-term, close linkages with a fixed group of suppliers. Similar to the Japanese car industry, manufacturers exercised close monitoring of and even provided technical assistance to their suppliers to ensure that the required quality standards could be attained. On the other hand, newly emerging Vietnamese motorcycle assemblers emulated the Chinese style of industrial organisation characterised by intense competition between a large number of lead firms and suppliers. They entered into the industry in the 2000s as they started the assembly of low-priced components

[2] Based on motorcycle production and sales data in the respective countries in 2006 (Honda Motor Co., Ltd. 2008).

imported from China. As these assemblers were compelled by the Vietnamese government to source components locally, they eventually developed arm's-length linkages with a moderately large number of suppliers based in Vietnam.

As discussed above, this book is concerned with the roles of different groups of actors in shaping suppliers' learning trajectories. Particularly for suppliers of components, the nature of linkages with their customers has vital implications for their activities as well as learning requirements. The coexistence of two contrasting types of linkages between motorcycle manufacturers and suppliers therefore makes the Vietnamese motorcycle industry a particularly illuminating case for in-depth examination.

By looking into the dynamic transformation of the Vietnamese motorcycle industry between the mid-1990s and 2008–2009, this book addresses the following research questions corresponding to the two research agendas mentioned above. The first question asks how supplier learning trajectories evolved over time. The focus is on the critical junctures in the process of capability building, which this book refers to as *learning events*.

Question 1: *How did local suppliers' capability building evolve from the late 1990s?*

The second question asks why learning trajectories evolved in the way they did. The focus is on analysing the constellations of relevant actors and knowledge flows that were conducive to key learning events.

Question 2: *What actor constellations and what knowledge flows led to critical learning events?*

While these are empirical questions specific to the Vietnamese motorcycle industry, it is hoped that exploring them will go a long way towards filling the two knowledge gaps in the literature on the trajectories and sources of capability building. Accordingly, this book argues that a decade-long *longitudinal analysis* that provides a balanced focus on the roles played by *both lead firms and suppliers* reveals a picture of local supplier learning that is substantially more dynamic, and gives a more insightful account than snapshot analyses or those that focus on either lead firms or suppliers alone. Along with the contribution to the theory of technological capability building, this book also seeks to make contributions to research methodology.

The remainder of the book is organised as follows. Chapter 2 provides an overview of the motorcycle industry, both at the global level as well as in the country of focus, Vietnam. Chapter 3 reviews the literature on the processes and mechanisms of capability building among developing country suppliers in general and the empirical literature on the Vietnamese motorcycle industry in particular. On the basis of the literature reviewed, this chapter identifies research gaps and reiterates research questions. Chapter 4 develops the conceptual framework. Chapter 5 discusses the methodology for empirical research. Chapters 6, 7 and 8

present the empirical analysis. Chapter 6 addresses the first research question by tracking supplier learning trajectories using the event-based approach. Chapters 7 and 8 turn the focus to the second research question. Chapter 7 outlines two contrasting models of supplier learning as they emerged in the early 2000s. Chapter 8 explains supplier learning trajectories in terms of the evolution of the two learning models after 2005. Chapter 9 concludes the book by summarising the empirical findings, discussing its wider implications, and elaborating on the areas for future research.

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Chapter 2
The Motorcycle Industry: The Global Context and the Vietnamese Case

Abstract In order to understand the evolution of the Vietnamese motorcycle industry, it is essential to grasp the contrasting features of the Japanese and Chinese motorcycle industries. Japanese lead firms developed long-term and exclusive ties with a small number of fixed suppliers in order to develop lead firm proprietary models and manufacture them to high quality standards, while Chinese lead firms made extensive use of market forces in managing their linkages with a large number of suppliers to achieve price-based competitiveness in producing copies or slightly modified versions of popular Japanese models. Vietnam was the first place outside of China where the two groups of lead firms fought for supremacy. The rapid transformation and development of the Vietnamese motorcycle industry has been driven primarily by the competition between Japanese motorcycle manufacturers, which sought to replicate the conventional Japanese sourcing practices, and local Vietnamese assemblers, which essentially followed the Chinese way of exploiting market forces for producing low-priced copies of Japanese models.

Keywords Motorcycle industry · Lead firm-supplier relationship · Japan · China · Vietnam

The introductory chapter elaborated on two features of the Vietnamese motorcycle industry which make it an illuminating case for analysing the trajectories and mechanisms of supplier learning. The first is the rapid development that the industry has undergone in the period of a decade. The second is the coexistence of two groups of motorcycle manufacturers or assemblers—or simply *lead firms*, to use the terminology of the conceptual framework adopted in this book to be developed in Chap. 4—that developed contrasting patterns of coordination in their relationships with suppliers.

Indeed, the development of the Vietnamese motorcycle industry is best understood in the context of the competition between two groups of lead firms cultivating contrasting types of linkages with their suppliers. However, before going into the detailed discussion of the Vietnamese case, a brief overview of the structural transformation of the global motorcycle industry is essential because it provides an important context to the evolution of the Vietnamese motorcycle

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industry. This chapter therefore starts by discussing the global context of the industry. An overview of the Vietnamese case will follow.

2.1 The Global Context

In the global motorcycle industry, Japanese motorcycle manufacturers have maintained leading positions since the 1960s (Fujita 2013a). To start with, motorcycles have integral product architecture. Because such products are characterised by complex mapping from functional elements to physical components and tightly coupled interfaces among interacting physical components, they call for fine-tuning between the whole product and its component parts if overall product performance is to be maximised (Ulrich 1995; Baldwin and Clark 2000). Since Honda launched the highly acclaimed Super Cub in 1958, which eventually became a dominant design (Abernathy and Utterback 1978; Abernathy and Clark 1985; Teece 1986) in this industry, motorcycle manufacturers have adopted proprietary product designs carrying components customised to particular models.[1] Honda, as well as three other Japanese motorcycle manufacturers that successfully followed suit, namely, Yamaha, Suzuki and Kawasaki, emerged as global industry leaders by producing high-quality models that carried lead firm proprietary designs.

To ensure a stable supply of large quantities of high-quality components customised to their specific models, the Japanese lead firms developed long-term and exclusive ties with a small number of fixed suppliers.[2] Using the terminology of the global value chain (GVC) approach, these lead firms developed *captive* chains with suppliers, in which suppliers were subject to centralised control and extensive intervention from their lead firms (Gereffi et al. 2005). By entering into transactions with Japanese lead firms, suppliers could expect large orders in the long run. They were also were offered various forms of assistance by the lead firms so that they could attain the lead firm requirements. However, suppliers were virtually locked into relationships with particular lead firms and were under pressure to reach their goals and specifications, often by ceding autonomy (Fujita 2013a).

[1] Not a single Super Cub component was used in common with Honda's other models (Otahara and Sugiyama 2005).

[2] A substantial body of research on the Japanese car and electronics industries has revealed how the distinctive model of intra- and inter-firm organisation contributed to the sustainment of superior product development and manufacturing performance (Smitka 1991; Clark and Fujimoto 1990, 1991; Nishiguchi 1994; Dyer 1996; Fujimoto 1999). Moreover, as Japanese firms expanded abroad via FDI, the model was transferred and adapted to different country contexts (Cusumano and Takeishi 1991; Sako 1992; Helper and Sako 1995; Ernst 2002). The organisational model was also adopted independently in both developed and developing countries by local producers seeking to improve the productivity of their operations (Kaplinsky 1995; Posthuma 1995a, b; Harriss 1995; Humphrey et al. 1998).

However, the dominance of the Japanese motorcycle manufacturers came to be challenged by the end of the 1990s. The challenge came from China, whose motorcycle production surpassed that of Japan in 1993 to emerge as the world's largest motorcycle producer. Unlike the case of Japan discussed above, the huge Chinese market was dominated by copies or slightly modified imitations of popular Japanese models that were produced by local manufacturers and sold at approximately 30–70 % of the price of the originals (Ohara 2005: 69). In a market where consumers prioritised prices over product quality and intellectual property rights are weakly protected, roughly a dozen of popular models developed by Japanese motorcycle manufacturers, which had been introduced into a number of Chinese state-owned motorcycle manufacturers under technological licensing agreements in the 1980s, were widely shared and replicated by Chinese manufacturers by the 1990s (Ohara 2001; Ge and Fujimoto 2004).

The sharing of several popular models across numerous players within this industry, which this book refers to as *de facto standardisation* of Japanese models, had an enormous impact on the relationship between lead firms and suppliers. De facto standardisation enabled a large number of lead firms and suppliers to enter into the assembly of motorcycles and the manufacture of components, respectively, and engage in arm's-length transactions of standardised components without being locked into particular relationships. The extensive use of market forces, with frequent switching of partners in terms of prices, enabled Chinese motorcycle manufacturers to achieve remarkable levels of price-based competitiveness and to thrive in the huge domestic market as well as other emerging markets.[3]

It needs to be emphasised, however, that de facto standardisation of the sort that prevailed in China failed to ensure full compatibility of components. For products with integral product architecture, full compatibility of components could only be guaranteed insofar as they were manufactured precisely in accordance with the original drawings of the Japanese base models (Fujita 2013a). However, this has not been the case in China, where repeated duplicative imitation of a given dominant model adopting different measuring methods and varying degrees of precision often gave rise to components that were not compatible with each other (Ge and Fujimoto 2004, 2005). Non-compatibility problems were typically addressed in an ad hoc manner by making ex post adjustments (ibid). Even such adjustments did not render components strictly compatible but was sufficient to make them *assemblable*. This means that Chinese firms compromised on product quality for the sake of reducing the need for explicit inter-firm coordination.

[3] China's exports of motorcycles started to expand since the late 1990s. China's top ten motorcycle export destinations from 1998 to 2008 were Nigeria, the United States, Vietnam, Indonesia, Argentina, Japan, Turkey, Mexico, Germany and Brazil (the author's calculation based on Global Trade Information Services, Inc. 2012).

2.2 The Vietnamese Motorcycle Industry

The rivalry between the Japanese and Chinese motorcycle manufacturers outlined in the previous sub-section is the key to understanding the evolution of the Vietnamese motorcycle industry. On the one hand, three major Japanese motorcycle manufacturers established production bases in Vietnam in the late 1990s. Following their conventional practices, they launched sophisticated products and sought to manufacture them to high quality standards by developing their exclusive supplier networks. Value chains developed by these manufacturers, referred to as *Japanese chains*, were characterised by captive model of industrial organisation.

On the other hand, in the early 2000s, Vietnamese lead firms started the assembly of component kits imported from China, which were largely low-priced, low-quality products imitating popular Japanese models. Similar to the Chinese case discussed above, the value chains developed by these assemblers, referred to as *Vietnamese–Chinese chains*, are best categorised as market chains. In excess of 50 Vietnamese assemblers initially assembled imported Chinese components. However, as the Vietnamese government strengthened import controls and local content rules, these assemblers gradually expanded local sourcing by engaging in on-the-spot transactions with a moderately large number of Vietnamese, Taiwanese, Korean or Chinese suppliers based in Vietnam. Because the components are standardised to the extent that they imitated popular Japanese models[4] and the product quality requirements were low, transactions involved little need for explicit coordination between lead firms and suppliers, with frequent changing of of partners on the basis of price.

Focusing on the repeated rounds of competition between the Japanese and Vietnamese lead firms, the development of the industry can be divided into three stages (Table 2.1).[5]

In Stage I (mid-1990s to the end of the decade), three Japanese and one Taiwanese motorcycle manufacturer engaged in domestic production of motorcycles. Following the Vietnamese government's decision to launch an import substitution policy to promote the domestic production of motorcycles, Honda, Yamaha, Suzuki and Taiwan's Sanyang established local factories (Table 2.2). As their sophisticated products were priced substantially higher than what ordinary Vietnamese consumers could afford, motorcycle sales as a whole stagnated, but Japanese–brand motorcycles still accounted for the bulk of the market (Fig. 2.1). This small, protected market hardly attracted any scholarly attention at this stage.

[4] According to the author's survey of motorcycle retailers in Hanoi and Ho Chi Minh City in August–September 2002, the bulk of the models produced by Vietnamese assemblers imitated Honda's two popular models: *Dream* and *Wave*.

[5] The discussion on the stages of development is based on the existing literature on this industry, including Fujita (2005, 2006, 2007, 2008, 2011, 2012, 2013b); Intarakumnerd and Fujita (2008, 2009); Pham and Shusa (2006); Pham (2007); Nguyen (2006, 2007); and the Motorbike Joint Working Group (2007).

Table 2.1 Stages of Vietnamese motorcycle industrial development

Stage	Market (annual sales)	Government policy	Foreign motorcycle manufacturers	Local assemblers
Stage I: Start-up phase (late 1990s)	Less than 500,000	Import substitution; encouraging FDI in domestic production	Foreign motorcycle manufacturers set up domestic production	(Did not exist at this stage)
Stage II: The China shock & its repercussions (2000–2004)	2000–2001: Over 2 million; 2002–2004: reduced to 1.5 million	From 2002 onwards: Strengthened enforcement of import controls and local content rules; restrictions on motorcycle registration and expansion of production capacity by foreign manufacturers	2000–2001: Lost market shares; 2002 onwards: Honda Vietnam launched a low- priced model, the Wave Alpha, and recovered market share	More than 50 assemblers emerged
Stage III: FDI-led development (2005–2008)	Over 2.5 million	Local content rules and restrictions on motorcycle registration and investments in production capacity expansion were abolished.	Fully recovered market share; increased FDI in component manufacturing	Consolidated into a smaller number of large assemblers

Source The author, based on Fujita (2011, 2012, 2013b)

Table 2.2 Major foreign motorcycle firms in Vietnam

Name of the manufacturer	Year of license	Ownership structure (Nationality and percentage of ownership in parenthesis)
Vietnam Manufacture and Export Processing Co., Ltd. (VMEP)	1992	Chinfon Group[a] (Taiwan, 100 %)
GMN Automobile & Motorcycle Parts Manufacture Joint Venture Co., Ltd.[b]	1995	Chaikomol Business (Thailand, 30 %), SKB (Thailand, 10 %), New Chip Xeng (Laos, 30 %), General Export Import Co. (Vietnam, 30 %)
Vietnam Suzuki Corp.	1995	Suzuki Corp. (Japan, 35 %), Sojitz (Japan, 35 %), Vikyno: Southern Agricultural Machinery Corp. (Vietnam, 30 %)
Honda Vietnam Co., Ltd. (HVN)	1996	Honda Motor Co., Ltd. (42 %), Asian Honda Motors (Thailand, 28 %), Vietnam Engine & Agricultural Machinery Corp. (VEAM) (Vietnam, 30 %)
Yamaha Vietnam Co., Ltd. (YVN)	1998	Yamaha Motors (Japan, 46 %), Hong Leong Industries (Malaysia, 24 %), Vietnam Forestry Corporation (Vietnam, 30 %)
Lifan Motorcycle Manufacturing Joint Venture Co.	2002	Chonqing Lifan (China) 70 %, Vietnam Import–Export Technology Development Co. (Vietnam, 30 %)

Note

[a] Chinfon Group owns Sanyang Industry Co., Ltd., a motorcycle manufacturer known for SYM brand motorcycles

[b] GMN stopped operating in 2004

Source Fujita (2006:329); prepared on the basis of interviews by the author; a survey commissioned to the Vietnam Institute of Economics, Vietnam Academy of Social Science in 2004

Stage II (2000–2004) was a period characterised by a major external shock and its repercussions. It was during this period that the Vietnamese motorcycle industry attracted wide interest from businesses, researchers, and policymakers in Vietnam and abroad. In the early 2000s, massive volumes of low-priced imitations of Japanese-brand motorcycles were imported from China—a phenomenon often dubbed the "China shock" (Fujita 2007). Since the Vietnamese government had prohibited the import of assembled vehicles, Chinese imports arrived in the form of knockdown component kits that were assembled by more than 50 local firms. With prices as low as a third to a quarter of foreign-brand models, these imitations quickly penetrated the medium- and low-income consumer markets that had hitherto been unexploited by foreign manufacturers. The market expanded four-fold in the late 1990s, and local assemblers of Chinese motorcycles commanded roughly 80 % of these extended sales (Fig. 2.1).

The China shock provoked a series of reactions from incumbent producers and policymakers. As Vietnam became a symbol of an expanded Chinese threat that had already become apparent in China, Japanese companies initiated company-wide efforts to regain market shares. This culminated in the launching of a new, low-priced model by Honda Vietnam (HVN) in 2002. The new model, named Wave Alpha and priced at approximately one-third of the company's previous models, quickly gained

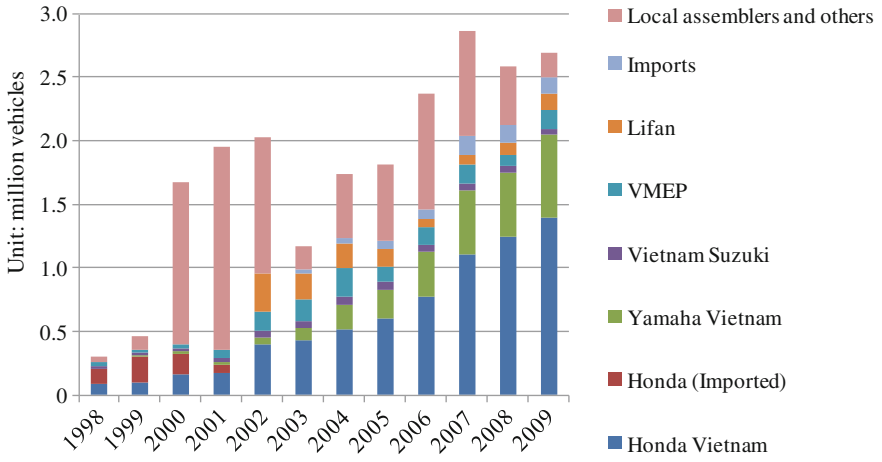

Fig. 2.1 Motorcycle sales in Vietnam by manufacturers. Notes: Data on "Honda (Imported)" was available from the Motorbike Joint Working Group (2007) up to 2005 but the figures were zero from 2002 onwards. *Source* Fujita (2013b), based on the Motorbike Joint Working Group (2007), Industrial Research Institute (2011) and General Statistical Office (various years)

popularity as the low-quality of Chinese motorcycles had by now become apparent to Vietnamese consumers (The Motorbike Joint Working Group 2007).

The Vietnamese government responded by enacting a series of policy changes to restore order and promote the sound development of the industry. However, the uncoordinated, sudden, and often arbitrary ways in which policy changes were enacted—frequently running contrary to previously announced plans and/or discriminating against foreign motorcycle manufacturers (Fujita 2011)—created serious side effects.

First, restrictions on the importation and registration of motorcycles were introduced. In September 2002, the Vietnamese government suddenly announced that imports of motorcycle components for the year should be limited to 1.5 million units (Cohen 2002). This was followed by restrictions on motorcycle registration[6] and limits on investments for expansion of production capacity by foreign motorcycle manufacturers from 2003.[7] Whilst these measures were intended to prevent the uncontrolled proliferation of motorcycles on Vietnam's streets, the consequence was stagnation of the overall market growth, with annual sales of motorcycles declining from over 2 million in 2002 to 1.17 million in 2003 (Fig. 2.1).

[6] Circular 02/2003/TT-BCA by the Ministry of Public Security dated 13 January 2003 limited motorcycle registration to one vehicle per person. Decision 98/2003/QD-UB by the Hanoi People's Committee dated 14 August 2003 prohibited new motorcycle registration in four central districts of Hanoi.

[7] Prime Minister's Decision 147/2002/QD-TTg dated 25 October 2002.

Second, in an attempt to encourage the development of local assemblers into fully fledged motorcycle manufacturers, the government stepped up the enforcement of local content rules, which hitherto had been circumvented by local assemblers,[8] and instituted standards for motorcycle manufacturers, with the requirement that a minimum of 20 % of local content had to be achieved by in-house manufacturing of key components.[9]

Notably, some of the aforementioned policies were implemented in ways that explicitly favoured local assemblers. When the government suddenly introduced quantitative restrictions on component imports in September 2002, local assemblers received a favourable allocation of import quotas, whilst insufficient quota allocation to HVN and Yamaha Vietnam (YVN) drove these companies to temporarily suspend their production.[10] From 2003 onwards, as noted above, the government restricted foreign motorcycle manufacturers from investing in the expansion of production capacity beyond the original proposals authorised by the Vietnamese authorities upon the issuance of FDI licences. This brought about serious damage to foreign motorcycle manufacturers because the rapid expansion of the market in the 2000s had not been envisaged in the 1990s when the investment decisions were made. HVN, in particular, suffered because this policy hampered the company's ambitions to use the Wave Alpha to regain lost market shares.

A new phase of industrial development (Stage III; 2005–2008) began as the end of the policy turbulence brought about rapid, FDI-driven growth. Diminishing academic interest in the industry notwithstanding, this was in fact the time in which the most dynamic development occurred (Fujita 2011). In 2005, the Vietnamese government abandoned restrictions on motorcycle registration[11] together with the policy that had prevented foreign motorcycle manufacturers from investing in additional production capacity.[12] As a result, domestic motorcycle sales climbed to 2.8 million units in 2007, far exceeding figures during the China shock (Fig. 2.1).

Japanese firms chose to satisfy the growing market in Vietnam via FDI for local production, following their conventional approach to the localisation of production

[8] The local content rules were originally announced at the end of 1998 for implementation from the beginning of 1999 (Decision of the Ministry of Finance 1994/1998/QD-TTg dated 25 December 1998). Their full implementation was delayed until the beginning of 2001 due to opposition from local assemblers (Ishida 2001).

[9] Prime Minister's Decision No.38/2002/QD-TTg dated 14 March 2002.

[10] Of the total of 1.5 million motorcycle component imports permitted for the whole year, local assemblers were allocated 900,000 units whilst foreign motorcycle manufacturers only received 600,000 (*Viet Nam News* 4 November 2002; Cohen 2002).

[11] Circular No. 17/2005/TT-BCA of the Ministry of Public Security dated 21 November 2005 rescinded legislation limiting motorcycle registration to one vehicle per person and only in the locality for which each held household registration.

[12] Official document No. 1854/VPCP-HTQT issued by the Government Office on 11 April 2005.

in countries with a large demand for their products.[13] Accordingly, they actively invested in expansion of production capacity, capturing an increasing share of this fast-growing market. In the meantime, local assemblers lost their market share but still held roughly one-third of the total sales as of 2006 (Fig. 2.1). They survived primarily by catering to low-income consumers in the rural areas where Japanese-brand models still had not penetrated.

2.3 Conclusion

This chapter has set out the context for the empirical analysis of the Vietnamese motorcycle industry. The key to understanding the evolution of this industry was the rivalry between Japanese and Chinese motorcycle manufacturers exhibiting contrasting types of competitiveness by developing very different types of value chains. Indeed, the rapid transformation and development of the industry has been driven primarily by the competition between Japanese motorcycle manufacturers, which sought to replicate the conventional Japanese sourcing practices, and local Vietnamese assemblers, which essentially followed the Chinese style of producing copies or slightly modified versions of popular Japanese models.

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[13] From its early years, "to explore the world market, to produce where the demand is" has been at the core of Honda's mission (http://www.honda.co.jp/50years-history/009.html, accessed 2 October 2011).

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Chapter 3
Literature Review

Abstract A comprehensive review of the existing literature on technological capabilities and sources of supplier learning reveals two shortcomings. First, insufficient attention has been paid to the evolutionary dynamics of firm-level learning trajectories, especially those of small developing country firms towards the bottom of the technological ladder. Second, the literature has failed to integrate lead firm and supplier perspectives in shaping supplier learning. This book therefore addresses the following two research questions: how did local suppliers' capability evolve over time, and why did the capability building trajectories evolve in the ways they did?

Keywords Supplier · Capability building trajectory · Knowledge sources

This chapter reviews the literature. First, two strands of literature related to the key issues set out in the introductory chapter, that is, the evolution of supplier learning trajectories over an extended period of time and the sources of supplier learning. Second, the chapter will go on to review the emerging literature on the trajectories and sources of supplier learning specifically in the Vietnamese motorcycle industry. On the basis of the research gaps identified, this chapter concludes by reiterating the research questions corresponding to the research gaps.

3.1 Evolution of Supplier Learning Trajectories

Based on the evolutionary theory of technical change (Nelson and Winter 1982), the technological capability (TC) approach considers that technological changes are not generated simply by importing equipment embodying new technology but instead require specialised resources accumulated through deliberate investment and effort (Lall 1992; Bell and Pavitt 1995; Bell and Albu 1999). These firm-specific, intangible resources are often referred to as *technological capabilities*. The processes through which firms acquire skills and knowledge are often referred to as *learning* (Bell 1984). This study therefore uses the terms *capability building* and *learning* interchangeably.

M. Fujita, *Exploiting Linkages for Building Technological Capabilities*, SpringerBriefs in Economics, DOI: 10.1007/978-4-431-54770-9_3,

Numerous studies have elaborated different stages in the capability accumulation process and modelled them as sequential paths that firms are expected to follow.[1] Despite the different terminologies used by different authors, the basic underlying concepts are remarkably similar. These sequences include steps along a common path, running from imitation (learning to use knowledge sourced from elsewhere) to innovation (learning to make changes to the existing knowledge) (Bell 2006).

In reality, capability formation does not necessarily evolve incrementally along a linear, pre-determined path. Firm-level learning trajectories often entail discontinuities and qualitative transformations— jumps, truncations or even reversals of previous learning trajectories (Bell 1984, 2006; Meyers 1990; Kim 1998).

However, when it comes to showing *empirically* how supplier learning evolves over time, very little of the existing research adequately addresses the time agenda (Bell 2006). While there have been a few in-depth case studies of the capability building trajectories of major corporations covering an extended period (Kim 1997; Dutrénit 2000; Figueiredo 2000, 2002), the paucity of knowledge on the evolution of learning trajectories is particularly serious among small-scale developing country suppliers towards the bottom of the technological ladder. Previous empirical studies in this field have largely focused on *snapshots* of supplier capability building. In these studies, learning has been assessed primarily in terms of the levels reached by firms at certain points in time (Ariffin and Figueiredo 2004, 2006, Figueiredo 2008a; Gammeltoft 2004) or the progress that firms made during the short period immediately preceding observation (Mitsuhashi 2005; Navas-Alemán 2006; Jonker et al.2006).

Nevertheless, such snapshot analyses suggest discontinuity in the learning trajectories of developing country suppliers. Some researchers explicitly focusing on the effects of major external shocks or policy shifts argue that instances of such major incidents constitute key turning points in the accumulation of technological capability (Tewari 1999; Figueiredo 2008a, b). A limited number of longitudinal studies that have analysed the learning trajectories of developing country suppliers over an extended period also point to the importance of the specific timing of intensive learning in the acquisition of advanced capabilities. Chitravas' (2006) detailed analyses of learning mechanisms at nine Thai auto parts suppliers show that learning trajectories often consist of slower and faster phases, and that faster learning phases are typically driven by major events such as the initiation of new business relations with foreign carmakers, the launch of new products, or engagement in export activities.

The notion that capability building paths may consist of major leaps forward, slower or truncated knowledge acquisition, or even retrogression at different times is critical because it suggests that one could arrive at very different interpretations depending on the timing of observation. This is corroborated by Bell (2006: 34),

[1] These include Lall (1992), Bell and Pavitt (1995), Ariffin (2000), and Figueiredo (2000, 2002). For a comprehensive review of the literature, see Bell (2007).

who discusses how two sets of empirical studies on the automotive industry in Latin America conducted by different researchers with varying time frames reached contrasting assessments of the industry's development. Bell (ibid.) concludes that short-term observations without understanding of longer-term processes of change easily lead to false judgements about the development of firms or industries.

In summary, the literature on capability building pays insufficient attention to the evolutionary dynamics of firm-level learning trajectories. This shortcoming is particularly relevant in terms of small developing country firms towards the bottom of the technological ladder. Therefore, longitudinal research is necessary to address this gap.

3.2 Sources of Supplier Learning

Analysing the sources of supplier learning requires an exploration of the roles of critical actors. Different types of actors are emphasised in various strands of the literature, as follows: (1) *lead firms* or buyers are emphasised in the GVC approach (Gereffi 1999; Humphrey and Schmitz 2001, 2004; Schmitz 2006); (2) *suppliers* themselves are the focus of the TC approach (Bell 1984; Bell and Pavitt 1995, 1997); and (3) other *public and private support organisations* such as universities, research institutes, and business associations are highlighted by the national or sectoral innovation systems approach (Lundvall 1993; Malerba 2002, 2004).

The vital role that lead firms play in shaping supplier learning is at the centre of the GVC approach (Schmitz 2004, 2006). This approach uses the notion of *chains* to refer to the sequence of activities required to bring a product or a service to consumers, starting from product planning, design, manufacturing, and marketing and distribution to after-sales services (Gereffi et al. 2001). Whilst these functions are undertaken by varieties of actors, the GVC approach emphasises the role of the lead firms because their control over strategic value chain functions, which typically include service-intensive activities like marketing and research,[2] often enable them to exert power over others in the chain (Palpacuer 2000; Schmitz 2006).

Indeed, central to the GVC approach is the governance of value chain, a concept that is employed to express that certain actors in the chain—most often the lead firms—set and enforce parameters under which others operate (Humphrey and Schmitz 2001; Schmitz 2004). Particular attention has been directed to role of the lead firm in setting and enforcing parameters with regard to: (1) what is to be produced, (2) how it is to be produced, (3) when it is to be produced, and (4) how much is to be produced (Humphrey and Schmitz 2001).

[2] Whilst such strategic functions vary across industries, in capital-intensive sectors such as the automotive industry, they typically include product development, marketing, and manufacturing of core components.

The concept of governance has been used extensively to explore various market and non-market patterns by which relationships between actors operating in the chains are coordinated (Humphrey and Schmitz 2001; Schmitz 2004; Gereffi et al. 2005). Focusing on the transactional relationships between lead firms and suppliers, Gereffi et al. (2005) classify the dominant patterns of governance into the following five types (in ascending order of explicit coordination).

- Market chain, in which transactions are mediated by market forces
- Modular chain, in which product standardisation reduces the frequency and intensity of interaction, as well as the level of mutual dependence between a lead firm and its suppliers
- Relational chain, which is characterised by complex and intense interaction between mutually dependent parties
- Captive chain, in which a powerful lead firm engages in extensive intervention and exercises control over smaller, dependent suppliers
- Hierarchical chain, within a vertically integrated corporation

Much of the research in this field has focused on whether certain types of governance are associated with certain types of supplier *upgrading*, a concept closely related to innovation and capability building (Gereffi et al. 2001; Schmitz 2004; Morrison et al. 2008). The emerging empirical literature has generated a consensus that the ways lead firms define and/or enforce parameters influence supplier learning in important ways.[3] In the words of Schmitz (2006: 566), "Chain governance structures the upgrading opportunities of developing country producers."

However, lead firms are not the only actors involved in supplier upgrading. The proponents of the GVC approach themselves admit that upgrading requires investment by suppliers in equipment, organisational arrangement, and people (Schmitz 2006, 2007). Yet, a major gap in this line of research is that it has not addressed the question of how the lead firm's support and the supplier's investment in learning interact to shape the supplier's capability building process.

Conversely, the TC approach focuses on the endogenous process through which local firms diffuse, adapt and create knowledge. This approach holds that technological change or innovation is not generated by investment in machinery and equipment but requires purposeful investment in human resources and change-generating activities (Bell 1984; Dahlman et al. 1987). The focus of this strand of the literature has largely been on supplier-internal factors such as learning strategies, activities and processes (Romijn 1999; Figueiredo 2003; Chitravas 2006; Scott-Kemmis and Chitravas 2007).

With growing interest in how external sources of knowledge contribute to firms' capability building, an increasing amount of attention has been directed at external sources of knowledge (Bell and Albu 1999; Nadvi 1999; Caniëls and Romijn 2003, 2005; Kim 2004). However, the focus of this strand of the literature

[3] For a review of the existing empirical literature, see Morrison et al. (2008).

has been on research institutes and universities, training organisations, machinery and input suppliers, and consultancy and information services, while explicit emphasis has not been placed on the critical roles played by lead firms in shaping suppliers' learning opportunities.

It is in this light that Morrison et al. (2008) argue for the need to integrate the GVC and TC approaches. They contend that this would help bring together two essential elements in learning and innovation of developing country firms: power relations around local firms and the endogenous process of capability development. However, Morrison et al. (ibid) do not elaborate on how such integration could be achieved in practice, or how an integrated framework might be utilised in an empirical study. Therefore, this also remains an important yet underexplored research agenda.

3.3 Local Suppliers' Capability Building in the Vietnamese Motorcycle Industry

Limited empirical analyses has been conducted on the Vietnamese motorcycle industry to date. Moreover, the majority of the existing empirical studies suffer from the following limitations. First, with the exception of Pham and Shusa (2006) and Pham (2007), the existing empirical analyses only provide snapshots of local suppliers' capabilities at given times. Second, these studies also suffer from a lack of analytical rigour. With the exception of Pham (2007), none of the authors adopts a systematic framework for classifying and assessing supplier capabilities. The bulk of the existing research including Pham (2007) is comprised of case studies of a very limited number of suppliers without any clear explanation as to the criteria for the selection of cases.

However, the emerging literature on the Vietnamese motorcycle industry does offer some insights into the two central issues studied in this book. With regard to the first issue, i.e., the evolution of local suppliers' capability building trajectories, Pham (2007) is the only empirical research that explicitly examines local suppliers' capability building processes using systematic methods. However, the conclusions reached are largely static: long-term, trust-based networks of Japanese motorcycle manufacturers promoted the acquisition of process capabilities, while arm's-length networks of local assemblers promoted the acquisition of product capabilities—an argument that is broadly in line with the main contentions of the GVC approach. Moreover, Pham's (2007) formulation of empirical data suggests a trajectory that progressed steadily once suppliers had entered into the production networks of Japanese and/or local assemblers.[4]

A possible reason why the existing empirical literature pays limited attention to the evolution of supplier learning trajectories is that it focuses almost exclusively

[4] This is clearly shown in Fig. 6.2 of Pham (2007: 195).

on Stage II of industrial development discussed in Sect. 2.2. Although the initial round of competition triggered by the China shock in Stage II opened up new opportunities for local firms to enter into Japanese or Vietnamese–Chinese chains, frequent and arbitrary government policy intervention up to this stage hardly offered a stable environment for lead firms or suppliers. It was only in Stage III that the fast-growing market and a less restrictive business environment conjoined to provide conditions conducive to supplier learning. In studying supplier development trajectories, it is therefore essential that the decade following the mid-1990s is analysed in terms of a continuum. To date, no study has attempted this.

In respect of the second issue, that is, the sources of supplier learning, most of the existing research has only focused on the role played by *one* of the two key actors: lead firms *or* suppliers. Pham and Shusa (2006) and Pham (2007) describe learning in Japanese chains mainly as an outcome of knowledge transfer initiated by the lead firm. While Nguyen (2006) and Tran (2009) discuss the determinants of learning from the supplier's perspective in a Japanese chain using the concepts of "responsiveness" and "readiness", respectively, these notions are neither clearly operationalised nor supported by hard empirical data. Meanwhile, Pham (2007) and Tran (2009) describe supplier learning in Vietnamese–Chinese chains largely as a unilateral exercise by the suppliers. In any case, none of the existing studies explicitly discusses how sources of supplier learning change over time.

3.4 Reiterating Research Questions

The foregoing review of the literature on developing country suppliers' capability building in general and in the Vietnamese motorcycle industry in particular identified two major research gaps. This book will address two research questions corresponding to these gaps.

One research gap concerns how supplier capability building trajectories evolve over time. In particular, there has been limited empirical research on how the learning trajectories of small-scale developing country suppliers towards the bottom of the technological ladder evolve over an extended period. The first research question therefore asks how local suppliers' capability evolved over time.

Question 1: *How did local suppliers' capability building evolve from the late 1990s?*

As will be elaborated in Chap. 5, the analysis will cover the period of a decade starting in the late 1990s, when Vietnam launched the domestic production of motorcycles, and the focus will be on the sequence of critical junctures in the supplier learning trajectories referred to as *learning events*.

The other research gap concerns the sources of supplier learning. Much of the existing literature has examined learning from either the suppliers' or the lead firms' perspective. There have been few attempts to integrate the two perspectives and analyse the sources of supplier learning along the lines suggested by Morrison

et al. (2008). The second question therefore asks why learning trajectories evolved in the way they did. The focus is on analysing the constellations of relevant actors and knowledge flows that were conducive to key learning events.

Question 2: *What actor constellations and what knowledge flows led to critical learning events?*

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Chapter 4
Conceptual Framework

Abstract This chapter develops the conceptual framework for empirical analysis of the Vietnamese motorcycle industry. The key conceptual apparatuses for exploring the evolution of supplier learning trajectories are the learning events and the two-dimensional matrix for the classification of capabilities. In exploring the sources of supplier capability building, the framework of actor engagement in supplier learning will be utilised to analyse various modes of involvement by key actors in supplier learning.

Keywords Capability matrix · Capability building trajectory · Learning event · Knowledge sources

This chapter presents the conceptual framework for exploring the two research questions elaborated in the previous chapter. Since analysing capability building trajectories requires a frame of reference to assess the nature and levels of capabilities at different points in time, this chapter begins by discussing the classification of capability. It then introduces the conceptual apparatus to analyse learning trajectories, *learning events*, and a framework within which to analyse the sources of capability building.

4.1 Classification of Capability

For the purpose of analysing the evolution of firm-level learning trajectories, it is essential to develop the classification of capabilities with observable indicators. Following the approach pioneered by Lall (1992) and Bell and Pavitt (1995), the technological capabilities that suppliers of motorcycle components require are classified in two dimensions:[1] the *functions* they perform, and the *levels* reflecting "the depth or degrees of creative engagement with technology" (Bell 2007: 98).

[1] Another possible dimension for the classification of capability is *investment cycles* (Lall 1992; Bell 2007). However, this dimension has been omitted because, unlike large plant-based industries such as chemicals and steel, major investment in sophisticated machinery is less relevant for motorcycle component suppliers at the lower end of technological development.

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In terms of the first dimension of functions, categories were developed on the basis of the literature on product development and production systems in the automotive industry (Clark and Fujimoto 1991; Fujimoto 1999), the literature on the industrial development of late-comer countries (Hayashi 1990; Suehiro 2000, 2008), the existing empirical analyses of the motorcycle industry in Asia (Otahara 2006, 2007; Ohara 2001, 2006; Higashi 2006; Thee 1997; Sato 2006, 2011), and the author's field research on motorcycle manufacturers and component suppliers in Japan, China, Thailand and Vietnam.

The broad categories of technological functions performed by motorcycle component suppliers are product development and production. The former functional category of product development is referred to in this book as *new product introduction*. This is because the types of activities undertaken by developing country suppliers are different from those engaged in by major developed country corporations.[2] As opposed to activities typically undertaken by major developed country corporations such as market research, formulation of product concepts, prototyping and development of product design drawings (Fujimoto 1999), developing country suppliers normally start by replicating products already available on the market via reverse engineering, and subsequently shift to conducting minor modifications and adaptations of the original product designs to meet the requirements of the local market.[3] These sorts of activities are best categorised as new product introduction.

The latter functional category of production is divided into two subgroups: *equipment-related* capabilities and *production management* capabilities (Sato and Fujita 2009). The key idea behind this classification lies in the distinction between *hard* and *soft* dimensions of production activities. Whereas the former directly deals with the operation of the hardware or the machinery and equipment, the latter is concerned with the management of the combination of the various elements of production: equipment, materials and components, human resources and information (Suehiro 2000, 2008). This distinction stemmed primarily from the literature on Japanese management, which sought to explain the competitive performance of Japanese firms in terms of effective production management on the shop floor implemented via such techniques as lean production, *just in time* systems or *kanban* and quality control (QC) circles (Itagaki 1997; Schonberger 1982; Abo 1994).

Specifically, equipment-related capability is concerned with operating, designing and improving production hardware, that is, machinery and equipment, dies and moulds, tools and jigs. The following three dimensions of equipment-related capability are particularly relevant to automotive component suppliers: (1) level of precision in manufacturing, (2) design of production processes and

[2] The author is grateful to Martin Bell for highlighting this point.

[3] This was observed from the earlier empirical analyses of the motorcycle industry in Asia, most notably in China (Ohara 2001, 2006), and the author's fieldwork in China, Thailand and Vietnam.

(3) design and manufacture of dies and moulds.[4] Production management capability refers to the ability to improve ways in which the different elements of production are organised in order to increase overall productivity performance (Suehiro 2008).

With respect to the classification of *levels*, this book adopts a simple four-tier classification system designed to accommodate the variety of activities and learning trajectories observed among motorcycle component suppliers in different types of value chains. The idea of using such fine-tuned classifications as those adopted in some of the recent sector-specific empirical analyses[5] had to be abandoned because the multitude of activities undertaken by motorcycle component suppliers and the variety of their capability building trajectories made it difficult to assume a priori fine-tuned steps for suppliers to follow. Accordingly, rather than formulating a set of detailed indicators for each level of capability (Figueiredo 2002; Ariffin and Figueiredo 2006), the framework developed by the present study simply sets out the fundamental principles guiding the assessment of the degree of suppliers' innovative engagement.

This adaptation essentially follows the evolutionary view of technical change, which regards firm-level innovation as being generated by activities designed to absorb, adapt and create technology (Nelson and Winter 1982; Romijn 1999). Most fundamentally, the distinction is made between technology-using capability and technology-changing capability (Bell and Pavitt 1995; Ariffin 2000; Figueiredo 2008a, 2008b).[6] The former is the ability to produce goods at a given level of efficiency according to given input specifications, and the latter is the ability to create, change or improve products, processes, production organisation or equipment (Schmitz 2007).

Since developing country firms normally first import mature, standardised technology and subsequently move on to acquire more advanced technology (Kim 1997, 2004), knowledge-using capabilities are classified into two levels by the degree of mastery. The *operational* level is the level at which the firm is able to operate the existing technology. The *assimilative* level is the level at which the firm has mastered the existing technology and is able to maintain stable and continuous operation over time. This distinction essentially follows Suehiro (2000), who pointed out that the step-up from the basic operation level to the

[4] Based on Fujimoto (1999), Asanuma (1999) and the presentation made by HVN's director in charge of procurement at the Seminar on Vietnam–Japan Supporting Industry Business Promotion hosted by Japan External Trade Organization (JETRO), the SME Technical Assistance Center and Japan International Cooperation Agency (JICA) and held at Melia Hotel, Hanoi, on 22 January 2007.

[5] For example, Figueiredo's (2002) framework adopts seven levels for steel firms, while Pham (2007) establishes eight distinct levels of capability for motorcycle component suppliers.

[6] Different authors use different terminology to refer to technology-using capability and technology-changing capability. Bell and Pavitt (1995) employ "production capacity" and "technological capability", while Ariffin (2000) and Figueiredo (2008b) coin the terms "routine production capability" and "innovative technological capability".

continuous maintenance level is the first major hurdle for the development of local firms in developing countries.[7] This distinction is also consistent with the frameworks adopted in most of the existing empirical studies reviewed earlier in this chapter.

Likewise, knowledge-changing capabilities range from making relatively minor adaptations to the existing technology to developing completely new technology (Hobday 1996). These are classified into two levels by the degree of innovativeness. The *adaptive* level is the level at which the firm is able to make relatively minor short-term adaptations to the existing technology. The *innovative* level is the level at which the firm is able to create new technology with significant elements of originality and novelty compared to the existing technology for medium- to long-term utilisation.

The above classification of capabilities results in the two-dimensional matrix presented in Table 4.1. In the context of the Vietnamese motorcycle industry, the main focus is on how suppliers starting at the pre-operational or operational level mastered stable operation of the existing technology (equivalent of the assimilative level) and eventually acquired the ability to make minor yet original improvements to the existing technology (i.e., adaptive level).

4.2 Capability Building Trajectories and Learning Events

Capability building is a long-term, cumulative process through which firms acquire new and progressively more advanced capabilities (Ariffin 2000; Figueiredo 2003). Although capability itself is intangible, acquisition of new capability can be confirmed by a firm's demonstrated capacity to perform new activities that it had not been able to do previously or to perform existing activities in an improved manner.

Firms are generally expected to progress from a lower to a higher level in one or more of their functional categories. However, not all firms progress steadily along a linear path.

As suggested by the literature reviewed in Sect. 3.1, whilst learning is an evolutionary process comprised of major leaps, incremental learning, halted learning, and/or even retrogression to previous levels, the overall learning process is driven primarily by varieties of major and minor incidents through which a firm acquires the ability to perform new activities that it had not been able to do previously, or to perform existing activities in an improved manner. Moreover, innovations are often stimulated by inputs, needs or pressure from users or the market (Abernathy and Utterback 1978). For component suppliers, it is often the lead firm requirements, which may or may not be communicated explicitly, that play this stimulating role.

[7] The second major hurdle is from design to home-manufacturing level (Suehiro 2000).

Table 4.1 Classification of capabilities

Type of capability	Level of capability	New product introduction	Production	
			Equipment-related	Production management
Production capability (knowledge-using capability)	Operational	Replication of existing/given products in the domestic market by recreating the design drawings	Basic operation of machinery and equipment, dies, moulds, jigs and tools to process components to the minimum level required in the domestic market	Routine production management required in the domestic market
	Assimilative	Replication of existing international-standard products by recreating the design drawings	Processing components and manufacturing dies, moulds, jigs and tools to a level required by foreign customers; maintenance and repair of machinery and equipment, dies, moulds, jigs, and tools	Maintaining stable production management fulfilling levels required by foreign customers
Innovation capability (knowledge-changing capability)	Adaptive	Making original improvements to existing products	Making original improvements to production systems, process specifications, and/or machinery/equipment	Making original improvements in production management so as to constantly boost its levels
	Innovative	Planning and designing new products with significant elements of originality and novelty compared to existing products	Proprietary processing technology with significant elements of originality and novelty; design/manufacture of high-precision dies and moulds	Establishing production management system so as to achieve the world's topmost level in production management

Source Adapted by the author from Sato and Fujita (2009), Lall (1992), Bell and Pavitt (1995), Figueiredo (2008b), and Kim (2004)

In analysing supplier capability building trajectories, this book focuses on incidents of major leaps in capability level. Such an incident—referred to as a *learning event*—is defined as an incident that signifies critical improvement in the way activities are conducted, and thus a major capability level leap in one or more of the functional categories shown in Table 4.1. The event-based approach has been used for analysing the management of innovation in the public and private sectors (Van de Ven and Poole 1995) and project-based learning in the service sector (Lema 2010).

Although a learning event might signify progress from a certain level to a higher level of capability, given the broad categorisation of capability levels adopted by this research, this is not a necessary condition; even progress within an existing level of capability would qualify as a learning event. The start date of an event is signified by the supplier launching a new initiative. Events may last for just a few months, or they might extend over several years. Goals or plans initially set before or on the start date may eventually be changed. Events are perceived to have terminated when the supplier has achieved an observable learning outcome (the end date). On the basis of the assumption that learning is stimulated by inputs or needs from the market, it is assumed that an event basically takes place in the supplier's activities in one or more value chains.[8]

Figure 4.1 exemplifies the capability building trajectory of a supplier in a given functional category of capability. The supplier experienced two major milestones that enabled it to progress from the operational to the adaptive level. The two events took place as the supplier responded to customer demands in different value chains (value chains A and B).

4.3 Sources of Supplier Learning

In order to develop a framework for analysing the sources of supplier learning, this book examines modes of actor involvement and knowledge flows between actors (Bell and Albu 1999; Ernst and Kim 2002). The modes of actor engagement in supplier learning are diverse in their inclusion of *direct* modes of involvement in the supplier's sourcing or generation of knowledge and *indirect* modes in inducing and facilitating the supplier's sourcing or generation of knowledge (Mitsuhashi 2005). Figure 4.2 presents a model of supplier learning incorporating the roles played by lead firms, suppliers and other external actors.

Based on the GVC and technology transfer literature, a lead firm's involvement in supplier learning is classified into three broad categories that correspond to the

[8] It is also possible for learning to take place in the course of exploring a completely new market, in which case an event might not be associated with a specific value chain. However, such an occurrence was rarely observed among local motorcycle component suppliersin Vietnam. The unstable market and government policy conditions made it highly risky for suppliers to engage in medium- to long-term R&D without any market assurance.

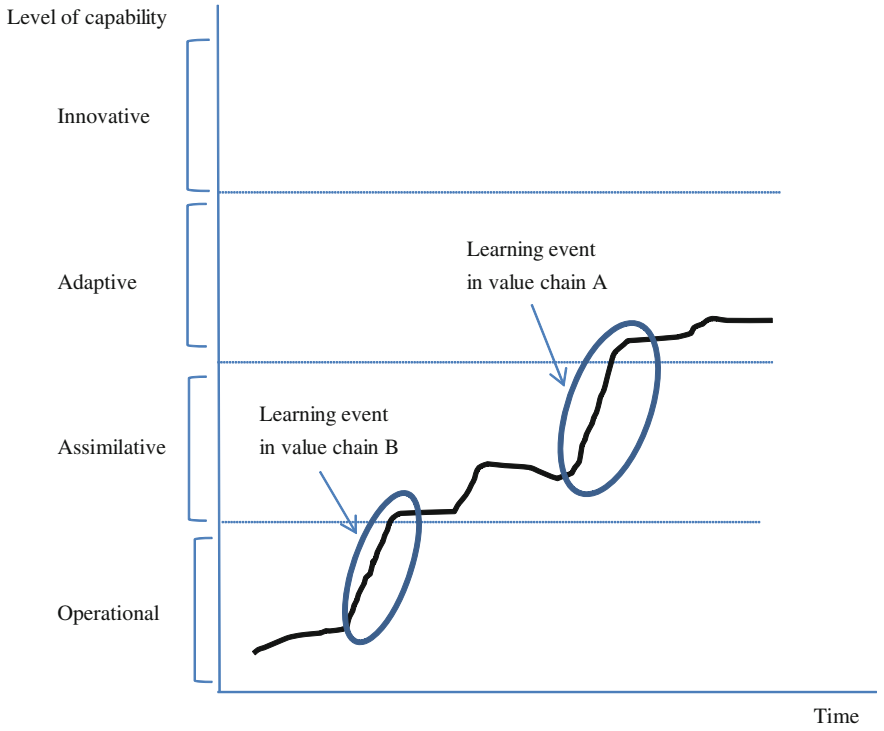

Fig. 4.1 Concept of learning events and learning trajectories. *Source* Prepared by the author

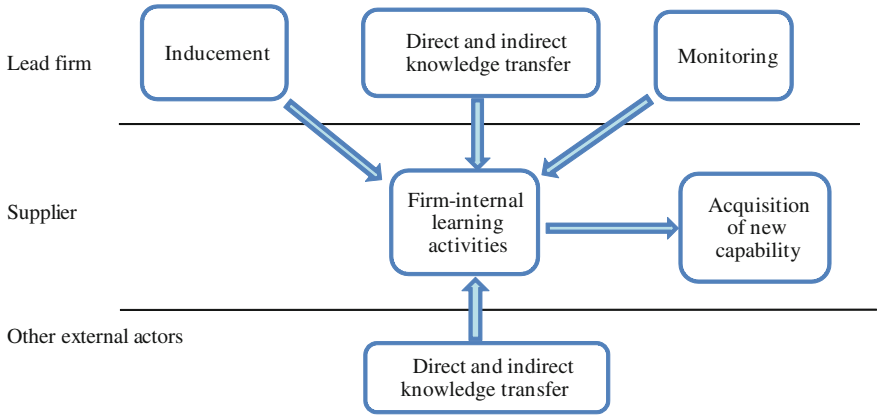

Fig. 4.2 Model of supplier learning: roles of key actors. *Source* Fujita (2012:116). Originally adapted from Schmitz (2006), Wong (1991, 1992), Mitsuhashi (2005), Ivarsson and Alvstam (2004, 2005), Ernst and Kim (2002), UNCTAD (2001)

main stages in the lead firm–supplier transaction cycle: inducement, direct and indirect knowledge transfer and monitoring.

Inducement refers to the lead firm's role in conveying to its suppliers the requirements and specifications to be met, thereby motivating them to learn and enabling them to set specific learning targets. The lead firm provides its suppliers with product design specifications and performance requirements as well as advance indications of future production plans, and quality performance or feature requirements and targets (Ivarsson and Alvstam 2004, 2005, 2010; Wong 1991; Mitsuhashi 2005).

Knowledge transfer may take direct and indirect forms. Direct knowledge transfer includes advice on, or assistance in, technical or non-technical aspects of production, on-site auditing of plant operations, troubleshooting of specific problems, and training of supplier staff through formal programmes or informal consultation (Wong 1991; Lall 1980; UNCTAD 2001; Ernst and Kim 2002; Ivarsson and Alvstam 2004, 2005; Mitsuhashi 2005; Schmitz 2006). Indirect knowledge transfer[9] includes the informal sharing of technical information and ideas, exposure to the lead firm's system of managing and organising production activities, and observation of the lead firm's corporate culture (Wong 1991, 1992).

Monitoring refers to testing and diagnostic feedback on quality and other dimensions of the performance of suppliers or their products against initially prescribed targets or requirements (Schmitz 2006; Wong 1991; Ivarsson and Alvstam 2010). Even where lead firms have no explicit policy of providing assistance to local suppliers, supplier learning may be facilitated by what Schmitz (2006) refers to as "detailed monitoring", which happens when monitoring includes both identifying failures and suggesting how these failures can be overcome.

An important point to note is that the GVC and global production network approaches have emphasised the role of TNCs from developed countries that are equipped with the capacity and skills to induce and monitor their suppliers' performance as well as the advanced knowledge to be transferred to less competent suppliers (Schmitz and Knorringa 2000; Humphrey and Schmitz 2006, 2004; Ernst and Kim 2002). However, the present framework can be applied to suppliers serving all sorts of lead firms, not just those developing linkages with major TNCs. The framework is designed to accommodate suppliers having linkages with domestic lead firms or lead firms from other developing countries, in which case limited knowledge or skills possessed by the lead firms may undermine their capacity to effectively engage in inducement, knowledge transfer or monitoring.

The TC approach emphasises the role of suppliers as the agents of learning. In the case of component suppliers in motorcycle value chains, the main channels through which suppliers generate new knowledge include investment in physical resources such as machinery and equipment, investment in human resources via recruitment and training, and in-house R&D and attempts at improving their

[9] Wong (1991) refers to this as "spillover transfer".

activities (Bell and Pavitt 1995, 1997; Caloghirou et al. 2004). To reflect the actual activities undertaken by motorcycle component suppliers, the latter were broken down into in-house R&D aimed at improvement of product design and development, improvement in production and organisational changes.

Apart from lead firms and suppliers, other actors may also contribute to supplier learning as sources of explicit or tacit knowledge. Public and private innovation-supporting organisations such as business associations, government agencies, consultants, international organisations, bilateral donors, research institutes and universities may all act as providers of advice, training, knowledge, or consultancy services (Malerba 2002, 2004; Malerba and Mani 2009). For small suppliers operating in industrial clusters, the mobility of skilled labour among firms and the diffusion of know-how between producers and users of machinery or production-related services may also constitute important sources of knowledge (Bell and Albu 1999).

4.4 Conclusion

This chapter developed the conceptual framework for empirical analysis of the Vietnamese motorcycle industry to explore the two research questions elaborated in the previous chapter.

The key conceptual apparatuses for exploring the first research question concerned with the evolution of supplier learning trajectories are the learning events and the two dimensional matrix of the classification of capabilities. The empirical research seeks to analyse the supplier learning trajectories by tracing the sequence of key learning events over time. The classification of the *functions* and *levels* of capabilities will be used to assess the nature of capabilities acquired by the suppliers as a result of the important junctures in the learning trajectories.

In exploring the second research questions concerned with the sources of capability building, this research will utilise the framework of actor engagement in supplier learning. The key to this framework is the modes of involvement by key actors in supplier learning, namely, lead firms, suppliers themselves and other actors, and the magnitude and nature of knowledge flows between these actors that facilitate the acquisition of new capabilities by the suppliers.

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Chapter 5
Methodology

Abstract This chapter discusses the methodology adopted for empirical analysis of the Vietnamese motorcycle industry. This book conducts retrospective case studies of suppliers purposefully selected so as to illuminate the diversity of learning trajectories and sources. Data collection is mainly through repeated rounds of in-depth interviews with these suppliers, which were supplemented by industry-level statistics and interviews with other key actors in the industry.

Keywords Retrospective case study · Purposeful sampling · Qualitative interviews · Multiple sourcing of data

This chapter discusses the methodology adopted for empirical analysis of the Vietnamese motorcycle industry. The chapter first introduces the overall methodological approach, which is retrospective case study. This is followed by discussion of the methods of selecting cases as well as data collection and analysis.

5.1 Research Design: Retrospective Case Study

This book seeks to analyse the processes and mechanisms of motorcycle component supplier learning that extended over a period of a decade. To this end, it adopts the *retrospective case study* (de Vaus 2001; Glick et al. 1995; Tuma and Hannan 1984) as the main overarching method. In the present context, this involves illuminating supplier capability building processes by observing the sequence of key events after a given supplier's entry into a value chain.

The basic unit of analysis is the supplier. However, individual learning events will also be analysed as embedded subunits. This study adopts a multiple, rather than single, case design, for two reasons. First, the conceptual framework presented in Chap. 4 assumes suppliers' learning trajectories to be heterogeneous depending on the ways suppliers themselves mobilise internal sources of knowledge, the modes by which other actors—most notably, lead firms—are engaged in supplier learning, and the nature and magnitude of knowledge flows between these actors.

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Second, the large number of local suppliers in the Vietnamese motorcycle industry and the recurrent changes in the learning performance of suppliers emerged as a serious constraint in identifying a single critical case. According to the official statistics, the total number of local firms registered as producers of motorcycle components was 60 in 2002 and 112 in 2006.[1] However, the actual number of suppliers is expected to be much larger. Nguyen (2004: 238), citing the report by the Economic and Financial Committee of the National Assembly in 2001, notes that around 550 firms produced motorcycle components.

5.2 Selection of Cases

While there is no ideal number of cases for the multiple case study method, the number should be sufficiently large to enable the researcher to encompass a range of variation more or less representative of the sector (Eisenhardt 1989). Given that the conceptual framework developed in Chap. 4 assumes a variety of factors to influence supplier learning trajectories, in-depth examination of a very small number of suppliers (two to five), the approach adopted by most previous studies on the Vietnamese motorcycle industry (Pham and Shusa 2006; Pham 2007; Tran 2009), was considered to be inadequate for this research. Rather, the author sought to cover a sufficiently large number of cases so as to shed light on the heterogeneity of learning trajectories among suppliers participating in different types of value chains as well as those participating in the same value chain.

The cases were selected *purposefully*, rather than randomly, based on a combination of two types of replication logic in case study research (Patton 2002; Yin 2003; Eisenhardt 1989). One is literal replication, which is aimed at producing similar results across cases. The other is theoretical replication, which is designed to produce contrasting results for predictable reasons. The following describes how the cases were selected.

First, cases were limited to firms that mainly produced key motorcycle components that were vital to manufacturers. These included suppliers of metal and plastic parts, firms specialising in particular production processes such as plating, and suppliers of dies and moulds. As a guideline, cases were limited to those firms that depended on motorcycle components for at least 40 % of their sales.

Second, reflecting the focus of this book on the lead firm as one of the key actors in the sector, cases were classified into three categories according to type of value chain and position in the chain, as follows: (1) first-tier suppliers in Japanese chains, (2) second-tier suppliers in Japanese chains, and (3) suppliers in Vietnamese–Chinese chains.

[1] The author's calculation based on the lists of operating firms provided by the General Statistics Office.

Third, within each category of suppliers participating in a particular type of value chain, attempts were made to include a subset of firms that were broadly similar in terms of attributes that might influence learning performance, as well as a subset of those that differed in this regard. Examples of such attributes include ownership, timing of entry into a value chain, and types of components manufactured. In the context of Vietnam, ownership (i.e., state or private) is critical because state-owned enterprises (SOEs) are generally more advantaged in access to financial resources than private firms (Leung 2009). Another key attribute in the context of this research is a supplier's membership in a state-owned business group called Vietnam Engine and Agricultural Machinery Corporation (VEAM). It is a business group managed by the Ministry of Industry and Trade and consisting of more than 20 member companies, traditionally specialising in the production of diesel engines and agricultural machinery. VEAM contributes 30 % capital to HVN,[2] and, as will be discussed in Chap. 8, membership in VEAM eventually emerged as an important factor influencing HVN's sourcing practices.

Other than by the replication logic described above, the selection of cases was inevitably subject to pragmatic constraints such as time, financial resources and access to firms (Eisenhardt 1989). To better ensure the quality of retrospective data covering the period of a decade, priority was given to those suppliers that had been interviewed by the author in the previous rounds of interviews in 2002, 2003, 2004 and/or 2005 (see Sect. 5.3 for details). However, new cases were also added because (1) the number of previously interviewed suppliers, particularly those in Vietnamese–Chinese chains, was not sufficient; (2) information on crucial suppliers, including those that had only recently entered Japanese or Vietnamese–Chinese chains, became available; and (3) some suppliers previously interviewed either could not be contacted or refused to be interviewed.

Table 5.1 provides the list of 21 case suppliers, illustrating the basic profiles and attributes underlying the replication logic that guided the selection of cases. Suppliers are classified into three groups according to the type of motorcycle value chain in which they participated. *Group A* consists of 11 suppliers that participated in Japanese chains but not in Vietnamese–Chinese chains; *Group B* comprises five suppliers that had initially participated in Vietnamese–Chinese chains but eventually entered a Japanese chain; and *Group C* consists of five suppliers that had participated in Vietnamese–Chinese chains but not in Japanese chains. None of the suppliers in Group A transferred from a Japanese chain to a Vietnamese–Chinese chain. The majority of them also participated in value chains other than Japanese or Vietnamese–Chinese ones.

Of the data given in Table 5.1, that under the heading *Business start-up* may need elaboration. The years of business start-up of the 21 case suppliers ranged from 1959 to 2004, which means that the length of a given supplier's operating

[2] VEAM is also a joint venture partner for Toyota and Ford in Vietnam. Vikyno, a manufacturer of agricultural machinery belonging to VEAM, also contributes 30 % capital to Vietnam Suzuki, which manufactures both cars and motorcycles.

Table 5.1 Suppliers selected for case study

Firm	Ownership	VEAM member	Type of component processing[a]	Number of employees	Business start-up	Products/experience prior to entry into a motorcycle value chain	Value chain participation[b]							
							Stage I		Stage II			Stage III		
							J	Other	J	V–C	Other	J	V–C	Other
A1	State		Plastic	550	1972	Household products	1	1	1		1	1		1
A2	State		Metal	1,350	1974	Bicycle components	1	1	1			1		
A3	State		Metal	1,000	1974	Household products	1	1	1		1	1		
A4	Private		Plastic	1,000	1988	Plastic packaging for export		1	1		1	1		1
A5	Private		Assembly	500	1994	Wire harnesses for export to Japan		1	1		1	1		1
A6	State	X	Metal	1,000	1968	Agricultural machinery and components		1	1		1	1		1
A7	Private		Specialised	81	2004	Senior management and key engineers gained experience at a Japanese company	c		c			1		
A8	State	X	Metal	1,100	1980	Diesel engines for domestic market		1	2		1	1		1
A9	Private		Specialised	150	1988	Replacement components		1	2			2		1
A10	Private		Plastic	182	1994	Household products and packaging		1	2			2		1
A11	Private		Specialised	170	1999	Components of dies and moulds		1			1	2		1
B1	State	X	Metal	600	1974	Bearings for domestic market		1		1	1	1		1
B2	State	X	Metal	157	1970	Components for agricultural machinery		1		1	1	d		1
B3	Private		Metal	200	1986	Replacement components		1	2	1	1	2		1
B4	Private		Metal	400	1981	Bicycle components		1	2	1	1	2	1	1
B5	Private		Metal	150	2001	Trading motorcycles	c			1		2		1
C1	Private		Metal	150	1959	Bicycle components		1		1				1
C2	Private		Metal	450	1987	Bicycle components		1		1				1
C3	Private		Metal	170	1996	Replacement components		1		1			1	1
C4	Private		Assembly	115	1988	Trading bicycles/motorcycles and components		1		1			1	
C5	Private		Assembly	100	1999	Trading motorcycle components	c			1				1

Source Adapted from Fujita (2012:119), prepared on the basis of the author's interviews and complemented by company brochures, and websites

[a] Types of component processing are classified as follows: *Metal* steel/aluminium parts requiring die-casting, machining, stamping, and/or forging processes; *Plastic* plastic injection moulding; *Specialised* suppliers engaged in specialised processes such as plating and high-precision machining; *Assembly* suppliers producing components mainly as assembly processes without large investment in processing equipment

[b] Value chain participation is indicated as follows: *1* first tier; *2* second tier

[c] Denotes that the supplier was not established at the respective stage of industrial development

[d] Indicates the firm was preparing to become a supplier. Although a formal supply contract was yet to be signed, it had experienced a learning event in this chain

experience could be anywhere between a few years and more than 40 years. Following the common approach to the investigation of firm-level capability building by stages of firm development (Ariffin 2000; Chitravas 2006), one might expect suppliers established in the 1960s to be much more advanced than those established in the 2000s. However, this was not necessarily the case. Length of operating experience prior to the start of market-oriented economic reform in Vietnam in the late 1980s made little difference to a supplier's learning attainment because the activities of such firms in those days were limited to the production of simple products for a stagnant domestic market subject to a centrally planned economic system that offered few opportunities for the acquisition of new capabilities. Therefore, taking account of the specific Vietnamese context, this book analyses capability building trajectories by the stages of industrial development since the mid-1990s outlined in Chap. 2 rather than by stages of suppliers' development.

5.3 Data Sources and Methods of Analysis

The most important source of data was the author's interviews with the 21 suppliers conducted between September 2008 and March 2009. All suppliers other than A5, A10, A11, B2, C1, C4 and C5 were interviewed more than once. The first interview was usually with a firm's senior management with the aim of identifying up to three major learning events experienced by the supplier since the mid-1990s. The second interview was usually with the manager(s) directly responsible for new product introduction and/or production activities, and focused on the collection of detailed data for each learning event.

Regarding the suppliers interviewed only once, a second meeting was generally considered unnecessary because in these relatively small-scale companies, the senior management was typically responsible for new product introduction and production activities. The small size of such firms, limited product lines, the narrow scope of activities, and/or the comparatively few learning events evinced made it possible for the author to collect the required data in an extended interview with the senior management.

Interviews were conducted in Vietnamese and were recorded with the permission of interviewees.[3] This decision was made on the basis of the fact that, as a non-native speaker of Vietnamese, the author had difficulty in simultaneously asking questions and taking notes. After the interviews, the recordings were used to prepare transcriptions in Vietnamese.

[3] In several cases, interviews were not recorded because either the interviewees explicitly refused to be recorded or the author judged that the interviewees were apparently reluctant to be recorded.

The first round interview began by asking about the supplier's overall business performance, product and market structure, and relations with its main customers since the late 1990s. The author then proceeded to elicit information on up to three major learning events that had taken place in the supplier's activities in a Japanese or Vietnamese–Chinese chain.[4] Senior managers were asked to identify the times at which the supplier's methods of introducing new products, engaging in equipment-related activities, or conducting production management changed the most. By asking what the supplier learned to do as a result of a particular event, the author judged whether the incident constituted the acquisition of a new capability or not.[5] If managers offered more than three incidents, the author selected the three that best demonstrated the extent to which improvement in capability level was achieved. Many events involved changes in the level of capabilities in more than one function. In cases of events associated with the suppliers' relationships with more than one lead firm, the suppliers were asked to identify the one that played the most vital role.

Having identified the domains of activities in which learning events took place, the author requested a second visit with the supplier for a meeting with the manager(s) in direct charge of the activities. Second round interviews normally proceeded as follows.

(1) Interviews began by identifying the supplier's capability status at the point of departure, that is, immediately preceding its entry into a motorcycle production value chain. Questions were asked about how each of the motorcycle value chain functions was conducted by the firm at this stage.
(2) The interviews proceeded to questions concerning how the means of conducting new product introduction or production changed after the learning events which were identified during the first interview. Follow-up questions were asked about the details of each event, such as how it actually took place, who participated in it, what contribution they made to the process, and what the firm was able to do as a result of the event. Additionally, firms were asked to rank the actors involved in the events in order of their significance to the outcome.
(3) Attempts were made to identify how one event eventually led to another. There were also instances when learning events identified in the first interview had to be modified as additional information pointed to the occurrence of more important events.

[4] In reality, the author ended up in securing details of between one and three events depending on the length of operation and growth path of each firm.

[5] Following the approach taken by Lema (2010), initial attempts were made to ask senior managers to shortlist the events they considered to be most important, but this invariably ended up in details of incidents that were completely irrelevant to the analytical framework of the present study. Therefore, it was eventually decided that the author should select the events and assess the capability levels on the basis of the analytical framework.

It needs to be acknowledged that data collection via qualitative interviewing is subject to limitations. Since knowledge is contextual and can only be constructed or reconstructed during interviews, the qualitative interview method is heavily dependent on the interviewee's capacities to interact with the interviewer as well as to remember, conceptualise and verbalise his or her experience (Mason 2002: 64). Particularly in retrospective interviews, typical errors are attributable to faulty memory, hindsight bias or intentional misrepresentation of the past to maintain self-esteem (Golden 1992). Whilst such errors cannot possibly be eliminated completely, the author sought to increase the validity and reliability of the findings primarily by multiple sourcing of data (Patton 2002).

First, as already elaborated, two or more individuals were interviewed for majority of the suppliers. Whilst senior managers were generally more concerned with the prestige of their companies, managers directly taking charge of new product introduction or production were often much more knowledgeable about and willing to provide first-hand information on actual activities. Obtaining information on a particular event from different individuals was likely to have helped to correct any biases that the individuals might have had.

Second, in most cases, an interview with the management was followed by a visit to the supplier's factory, where the author had a chance to observe the components being manufactured, the types of machines and equipment being used, production management techniques being applied and the degree of worker discipline. The on-site visit provided precious pieces of evidence on the present status of the suppliers' activities and enabled the author to confirm the reliability of the data obtained during the interview.

Third, data gathered through the author's previous interviews or surveys for some of the case suppliers between 2002 and 2005 were utilised extensively. Since they were driven by different yet related sets of questions, some of this data transpired to be usable in the present study. Notes taken during factory visits were also precious sources of information that could be used to help identify degrees of change. Moreover, the general understanding of a given company's development process and previous situation derived from past interviews also provided excellent foundations for preparing specific questions for the present study's interviews. The author's thorough knowledge of suppliers' previous situations also enabled consistency checks and the extraction of data of much higher quality and precision than would otherwise have been possible.

Fourth, suppliers' direct customers (lead firms in the case of first-tier suppliers, and first-tier suppliers in the case of second-tier suppliers) provided vital objective assessments of learning performance and trajectories. In particular, data provided by HVN, as well as lead firms and first-tier suppliers engaged in regular transactions with more than one of the 21 case suppliers, were critical as many assessments and remarks were presented comparatively. In the event that supplier and lead firm interviews produced different results, the author attempted to reconcile inconsistencies by looking for hints as to possible reasons for the differences through careful interpretation of interview data derived from both sides. Wherever possible, a third party such as an industry expert was also interviewed.

Suppliers' direct customers also provided detailed information on the roles they played in encouraging the suppliers' capability building. They became the vital source of data on the lead firms' engagement in supplier learning and the nature of knowledge flows, including how and why these changed over time, of which many of the suppliers were not necessarily aware. In short, researching both sides of the value chain has made it possible to gain a comprehensive picture of the mechanism of suppliers' capability building.

Fifth, additional data were obtained from websites, annual reports, company directories, brochures of international exhibitions in which suppliers had participated, and reports prepared by experts who had visited suppliers at different times. Reports prepared by technical experts who had been dispatched by aid organisations to evaluate supplier capabilities provided particularly useful information.[6]

The full list of interviews is provided in Appendix. Interviews cited in this book are referred to by firm and interview codes as explained in Appendix.

Through the data collection process, the author amassed a set of questionnaires completed during interviews, hand-written notes taken during interviews and factory visits, photographs of production sites, and several hundred pages of interview transcriptions. The analysis began with the coding of these materials to create a database of learning events, which covered start and end dates, types and levels of capability attained as a result of the events, types of value chains in which the events took place, actors involved in the events, and sources of knowledge mobilised in the process of the events.

In the initial stages of analysis, the database was utilised extensively to search for similarities and differences in learning attainment and its sources across suppliers. Since the fact that suppliers had *not been sampled randomly* meant that percentages (of events or suppliers) could not be used to support hypotheses, the author followed the replication logic to search for similarities across suppliers classified by value chain participation and identify the reasons for any exceptions. As the author proceeded to the supplier-level analysis, an initial attempt was made to utilise the database to analyse learning trajectories as a sequence of events that took place within a particular supplier. In the last stage of the analysis, an effort was made to conduct an in-depth comparative examination of a small number of particularly illuminating cases.

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Chapter 6
Local Suppliers' Capability Building: Attainment and Trajectory

Abstract An empirical analysis of supplier learning trajectories reveals that supplier learning in the Vietnamese motorcycle industry was an extended process consisting of major leaps, slow progress and/or halted learning. After a period of slower learning up to the early 2000s, suppliers in both Japanese and Vietnamese-Chinese value chains exhibited a divergence in learning performance after 2005, whereby some suppliers experienced major leaps towards acquisition of basic innovative capabilities while others saw their learning stall.

Keywords Supplier · Capability building · Learning attainment · Learning trajectory · Value chain

This chapter presents the findings of the empirical study in relation to the first research question:

How did local suppliers' capability building evolve from the late 1990s?

The chapter starts by discussing the status of the Vietnamese motorcycle component supply base in general and that of the case suppliers in particular in the mid-1990s. This is intended to provide an overview of the starting point for the suppliers' capability building trajectories. The chapter then proceeds to the analysis of the suppliers' learning attainment, focusing on the functions and levels of capability acquired by suppliers. Lastly, the chapter will analyse the trajectories that led to the learning attainment.

6.1 Starting Point: Emergence and Initial Experiences

Before going into an in-depth analysis of learning events experienced by case suppliers, it is essential to have discussion on the starting point of the capability building trajectories for case suppliers. This sub-section therefore discusses the status of Vietnam's motorcycle component supply base in the mid-1990s and

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highlights the activities undertaken by the case suppliers prior to their entry into motorcycle value chains.

Vietnam's motorcycle component supply base—or supply base for assembly-type machineries more generally—remained seriously underdeveloped in the 1990s. Although precise data are not available, mechanical industry in Vietnam in those days consisted of two types of firms. One was SOEs engaged in mechanical engineering industries, typically those producing diesel engines and agricultural machinery on a small scale, often using outdated machineries introduced under the centrally planned economic system under the assistance from the Union of Socialist Soviet Republic (USSR) or Eastern European countries. The other was small-scale private enterprises or household businesses engaged in the production of replacement components for bicycles or motorcycles. Virtually none of these firms had experience of serving customers from developed countries. Japanese experts who visited nine major local Vietnamese companies engaged in processing metal, plastic and rubber products in 1995 remarked:

> Visiting…local companies for the first time, we were surprised to find that their levels were far [lower] than the component manufacturers we have known and have instructed [in other Asian countries] in the past. We have come to think that instructing these companies will require a great deal of patience and new ideas (JETRO 1996: 1).[1]

The underdeveloped status of the domestic component supply base can also be confirmed by the data on the case suppliers. For four of the 21 case suppliers (A7, B5, C4, and C5), the business start-up coincided with their entry into either Japanese or Vietnamese-Chinese chains. Virtually all of the remaining case suppliers, including those that became HVN's first-tier suppliers in the late 1990s, had been engaged in small-scale production of either simple metal or plastic products for household use or components for bicycles, agricultural machinery, or diesel engines for the domestic market in the mid-1990s.[2]

The variety of operating experience prior to the entry into motorcycle value chains is illustrated by the following three suppliers of plastic components. A1, an SOE under the management of the provincial-level government, was mainly engaged in the production of household plastic products like buckets and wash-basins, as well as components for electric fans and bicycles for the domestic customers (interview with A1 #1).

By contrast, A5 started out in 1990 as a household business by former employees of a major state-owned plastic factory, and was transformed into a limited liability company in 1995. As of the late 1990s, it focused on simple products like plastic containers and bottles for liquid toiletries such as shampoos

[1] Originally in Japanese, translated by the author.

[2] The only exception was supplier A5, which had exported wire harnesses for cars to Japan since the company's establishment in 1994. The export business was facilitated by the elder brother of the company's general director, who had studied and worked in Japan for 40 years since the late 1960 s (interview with A5 #1).

and detergents, although the company's major customers included major TNCs based in Vietnam (interview with A5 #1).

A10 was established in 1994 as a limited liability company by a former engineer at a state organisation specialised in designing and manufacturing dies and moulds. Its key products in the late 1990s were plastic household products and components for simple electric equipment like fans (interview with A10 #1).

Similar variations in operating experiences were observed among suppliers of metal processed components. A3 was established in 1974 as an SOE under the management of the central government. Under the centrally planned economic system, the company was engaged in the production of stainless steel kitchenware and toolboxes for export to Eastern Europe. With the collapse of the socialist regimes in Eastern European countries and the launching of Vietnam's economic reforms in the late 1980s, the company was compelled to diversify its market as well as products. As of the mid-1990s, however, the company still continued to produce simple products for the domestic market, with limited change to its previous product lines (interviews with A3 #1, #2).

B4 was established in 1981 as an industrial cooperative engaged in the production of various steel and plastic components for bicycles, but subsequently shifted the focus of its activities to stamping and plating of steel products. By the mid-1990s, it started to diversify its products to motorcycle components as it won orders from first-tier Japanese and Taiwanese suppliers, thereby becoming second-tier suppliers for HVN and Vietnam Manufacturing and Export Processing Co., Ltd. (VMEP). As the scale of production expanded, the supplier was registered as a limited liability company in 2000 (interview with B4 #1).

Despite variations, the operating experiences prior to the entry into motorcycle value chains described above generally suggest that the case suppliers had accumulated experiences primarily in producing simple plastic or metal products for the domestic market. The remainder of this chapter will examine the progress in acquisition of new product introduction and production capabilities that the suppliers made after their entry into Japanese and/or Vietnamese-Chinese chains.

6.2 Attainment: Functions and Levels of Capability Acquired

The author's interviews with 21 case suppliers identified a total of 56 learning events. While the aim was to identify three events per supplier, only one or two could be identified for suppliers A6, A7, A11, B5, C4 and C5. The reasons include a short history of operations after entry into a motorcycle value chain (A7 and C4), limited scope of activities conducted by the suppliers (A7, A11, B5 and C5) and/or the fact that suppliers focused on comparatively few major projects (A6). Some identified events were on-going as of 2008–2009.[3] Of the 56 events, 44 occurred

[3] A8's third learning event, analysed in depth in Sect. 8.1.3, is a typical example.

mainly in suppliers' activities in either Japanese or Vietnamese–Chinese chains, while the remaining 12 events were concerned with suppliers' activities in other value chains either in the motorcycle or other industries. The main focus of the empirical analysis is on the 44 events in Japanese or Vietnamese–Chinese chains; the remaining 12 events in other chains are partially covered in the analysis of supplier learning trajectories in Sect. 6.3.

Table 6.1 provides a list of the 56 events, including the stage of industrial development during which each took place, the type of value chain in which each took place, and the functional type of capability acquired in each instance. In respect of those events concerned with suppliers' activities in more than one value chain, the two most important chains are shown. Although it was possible for a learning event to take place in a supplier's activities in *both* Japanese and Vietnamese–Chinese chains, this did not occur in any of the events identified by the 21 suppliers.

A closer look at the learning events reveals that the type of chain seems to be associated with the functional type of capability acquired. Of the 33 events that took place in Japanese chains, 26 were associated with the acquisition of equipment-related capabilities and 30 with the acquisition of production management capabilities. Significantly, none of them was associated with the acquisition of new product introduction capabilities. Conversely, events in Vietnamese–Chinese chains were associated with acquisition of capabilities in a wider range of functions, as follows: new product introduction (nine out of 11 events), equipment-related activities (seven events), and production management (six events).

In terms of level, suppliers' learning attainment can be analysed by comparing the initial level (level of capability immediately before the supplier's entry into the value chain in question) and the highest level reached as a result of learning events experienced in the respective value chain. An important point to note is that this latter level refers to the stage at which suppliers' most advanced activities in the respective value chain took place and therefore needs to be distinguished from *full mastery* of the level of capability in question.

Table 6.2 shows the results for learning in Japanese and Vietnamese–Chinese chains, respectively. With regard to those suppliers that participated in both Japanese and Vietnamese–Chinese chains, results for learning in each are shown separately. Let us begin with a note on the starting point, that is, the period immediately preceding a supplier's entry into a Japanese or Vietnamese–Chinese chain. As discussed in the preceding sub-section, the case suppliers either conducted routine operations in the domestic market (equivalent to the *operational* level) or had not yet commenced production at this stage.

By 2008–09, suppliers in groups A and B had achieved remarkable improvement in capability levels via learning events in Japanese chains. This was particularly the case in respect of first-tier suppliers, some of which (A1, A2, and A5) even reached the adaptive level for either or both equipment-related and production management capabilities. While most first-tier suppliers reached the assimilative level for both types of capability, three (A4, A5, and A8) did not reach this stage with regard to either capability type.

Table 6.1 List of learning events

Supplier code/ Event #	Event title	Stage of industrial development	Type of value chain[a]		Type of capability acquired[b]
			Main	Secondary	
A1-1	Improved processing and production management to obtain a contract to supply simple plastic components to HVN and VMEP	I	HVN-1	Other	Eq/PM
A1-2	Developed and instituted company-wide management system for improved quality, costs and delivery (QCD) performance and to obtain ISO 9001 certification	III	HVN-1	Other	PM
A1-3	Upgraded capacity to design and manufacture plastic moulds of higher precision; obtained HVN recognition as supplier of plastic moulds	III	HVN-1	Other	Eq
A2-1	Improved processing and production management for obtaining a contract to supply chain cases to HVN	I	HVN-1	–	Eq/PM
A2-2	Improved processing and process design for increased product variety with higher precision levels for HVN	II	HVN-1	–	Eq/PM
A2-3	Instituted improved organisational arrangements for making constant improvements in process design to meet tighter HVN QCD requirements	III	HVN-1	–	Eq/PM
A3-1	Improved processing and production management to obtain a contract to supply toolboxes to HVN	I	HVN-1	–	Eq/PM
A3-2	Improved processing and process design for increased product variety with higher precision levels for HVN	II	HVN-1	–	Eq/PM
A3-3	Improved production management and established high-precision processing lines at new factory to meet tighter QCD requirements	III	HVN-1	–	Eq/PM
A4-1	Improved processing and production management to obtain a contract to supply simple plastic components to HVN	II	HVN-1	–	Eq/PM

(continued)

Table 6.1 (continued)

Supplier code/ Event #	Event title	Stage of industrial development	Type of value chain[a]		Type of capability acquired[b]
			Main	Secondary	
A4-2	Set up operation to design and manufacture moulds for plastic components to be supplied to HVN	III	HVN-1	–	Eq/PM
A4-3	Conducted market research and developed new products (plastic toys) to be exported to Europe	III	Other	–	Prd
A5-1	Replicated sample of wire harness to supply to local car manufacturers	II	Other	–	Prd
A5-2	Set up operation to source subcomponents and assemble wire harnesses to be supplied to HVN	II	HVN-1	–	PM
A5-3	Improved management of second-tier suppliers to meet tighter HVN cost reduction targets and environmental standards	III	HVN-1	–	Eq/PM
A6-1	Improved processing and production management to obtain a contract to supply sprockets to HVN	II	HVN-1	–	Eq/PM
A6-2	Established new high-precision forging process to supply core engine components to Japanese first-tier supplier to HVN	III	HVN-2	–	Eq/PM
A7-1	Set up operation to design and manufacture dies and moulds to be supplied to HVN and its first-tier suppliers	III	HVN-2	HVN-1	Eq/PM
A7-2	Improved production management to meet large orders to tighter HVN lead time and delivery requirements	III	HVN-1	HVN-2	PM
A8-1	Improved production management practices in supplying subcomponents to local first-tier supplier to HVN	II	HVN-2	–	PM
A8-2	Improved processing to expand production of machinery components for export and the domestic market	III	Other	–	Eq
A8-3	Established high-precision forging lines to supply core engine components to HVN	III	HVN-1	–	Eq/PM

(continued)

Table 6.1 (continued)

Supplier code/ Event #	Event title	Stage of industrial development	Type of value chain[a]		Type of capability acquired[b]
			Main	Secondary	
A9-1	Developed new plating line with improved production management practices for subcontracting plating process to Japanese and Taiwanese suppliers to HVN and YVN	II	HVN-2	YVN-2	Eq/PM
A9-2	Acquired trivalent chromium plating technology to meet HVN's tighter environmental standards	III	HVN-2	Other	Eq/PM
A9-3	Improved production management for new customers in the electronics industry	III	Other	HVN-2	PM
A10-1	Upgraded capacity to design and manufacture plastic moulds for Taiwanese and Japanese first-tier suppliers to HVN and YVN	II	HVN-2	YVN-2	Eq
A10-2	Conducted reverse engineering to supply plastic containers to local customers	II	Other	–	Prd
A10-3	Improved production management to meet tighter QCD requirements and to obtain ISO 9001 certification	III	HVN-2	YVN-2	PM
A11-1	Improved processing and production management practices to supply subcomponents to first-tier Japanese suppliers to HVN and YVN	III	HVN-2	Other	Eq/PM
A11-2	Improved processing and production management to realise higher precision levels and shorter lead time required by customers	III	HVN-2	Other	Eq/PM
B1-1	Conducted reverse engineering and manufacture of stamped metal components to order for local assemblers	II	V–C	–	Prd
B1-2	Improved processing and production management practices to obtain a contract to supply components to HVN	II	HVN-1	–	Eq/PM

(continued)

Table 6.1 (continued)

Supplier code/ Event #	Event title	Stage of industrial development	Type of value chain[a]		Type of capability acquired[b]
			Main	Secondary	
B1-3	Improved production management to meet tighter HVN QCD requirements; recognised by HVN as one of the top ten best-performing suppliers of 2007	III	HVN-1	–	Eq/PM
B2-1	Improved processing to produce engine components for local assemblers	II	V–C	–	Eq
B2-2	Improved production management in preparation to obtain approval of and supply components to HVN	III	HVN-1	–	PM
B2-3	Designed and manufactured moulds for components for agricultural machinery and other products	III	Other	–	Eq
B3-1	Conducted reverse engineering and manufacture of die-cast aluminium components to order for local assemblers	II	V–C	Other	Prd/Eq/ PM
B3-2	Improved processing and production management practices; won contract to supply components to first-tier Japanese supplier to HVN	II	HVN-2	–	Eq/PM
B3-3	Improved production management and mould maintenance to meet tighter requirements of Japanese first-tier supplier to HVN	III	HVN-2	–	Eq/PM
B4-1	Conducted market research and component design for regular launch of new silencer models incorporating cosmetic and functional improvements potentially demanded by local assemblers	III	V–C	–	Prd
B4-2	Improved production management to meet tighter QCD requirements for Japanese first-tier supplier and to explore new customers for motorcycle components	III	HVN-2	Other	PM
B4-3	Set up mould design and manufacturing operations to explore new customers for motorcycle components	III	HVN-2	Other	Eq

(continued)

Table 6.1 (continued)

Supplier code/ Event #	Event title	Stage of industrial development	Type of value chain[a]		Type of capability acquired[b]
			Main	Secondary	
B5-1	Launched production of clutches to be supplied to local assemblers	II	V–C	–	Eq/PM
B5-2	Improved processing and production management to meet requirements of Japanese first-tier suppliers to HVN	III	HVN-2	–	Eq/PM
C1-1	Conducted reverse engineering and manufacture of stamped metal components to order for local assemblers	I	V–C	–	Prd/Eq/ PM
C1-2	Improved processing and production management to produce motorcycle components to be supplied to VMEP	II	Other	–	Eq/PM
C1-3	Replicated samples and improved production management to export forklifts to a new customer in Germany	III	Other	–	Prd
C2-1	Conducted reverse engineering and manufacture of an increasing variety of engine components to order for local assemblers	II	V–C	–	Prd/Eq/ PM
C2-2	Improved product design capacity to develop a new motorcycle valve model and improved processing of them as replacement components for the domestic market	II	Other	–	Prd/Eq
C2-3	Improved process design to achieve better quality and productivity of replacement components for the domestic market	III	Other	–	Eq
C3-1	Conducted reverse engineering and manufacture of silencers to order for local assemblers	II	V–C	–	Prd/Eq
C3-2	Improved reverse engineering and processing to meet requirements of local assemblers	III	V–C	–	Prd/Eq
C3-3	Improved production management to produce motorcycle components for VMEP	III	Other	–	Eq/PM

(continued)

Table 6.1 (continued)

Supplier code/ Event #	Event title	Stage of industrial development	Type of value chain[a]		Type of capability acquired[b]
			Main	Secondary	
C4-1	Launched the assembly of shock absorbers for local assemblers	III	V–C	–	Prd/PM
C5-1	Launched the manufacture of motorcycle chains for local assemblers	II	V–C	–	Prd/PM
C5-2	Conducted market research and developed an increasing variety of replacement components for the domestic market	III	Other	–	Prd

Notes

[a] Value chain types are abbreviated as follows: *HVN-1* first-tier supplier in HVN value chain; *HVN-2* second-tier supplier in HVN value chain; *YVN-2* second-tier supplier in YVN value chain; *V–C* Vietnamese–Chinese chain

[b] Types of capability are abbreviated as follows: *Prd* new product introduction; *Eq* equipment-related; *PM* production management

Source Prepared by the author on the basis of the interviews with the suppliers

The levels of learning attained by second-tier suppliers (A9–11 and B3–5) generally fell short of those of first-tier suppliers. None reached the adaptive level, and only one of the six second-tier suppliers (A11) reached the assimilative level for both equipment-related and production management capabilities.

Conversely, suppliers in groups B and C failed to achieve notable improvement in capability levels whilst in Vietnamese–Chinese chains, and their capability levels even by 2008–09 remained largely at the operational level. However, there was one notable exception: B4 reached the adaptive level of new product introduction capability whilst operating in a Vietnamese–Chinese chain.

The findings can be summarised as follows. First, with regard to functional categories of capability, learning in Japanese chains concentrated on equipment-related and production management capabilities, while learning in Vietnamese–Chinese chains covered a wider range of functions that included new product introduction. Second, in terms of levels, most suppliers in Japanese chains—those of the first-tier in particular—had reached the assimilative level of production capability by 2008–2009. On the other hand, learning attainment in Vietnamese–Chinese chains was generally modest, although there was an exceptional case of a supplier that reached the adaptive level of new product introduction capability.

6.3 Learning Trajectories: Identifying Discontinuity

This sub-section examines the trajectories that led to the learning attainment discussed above. It does so by examining learning events in sequence and identifying the timing of major leaps in capability level. It begins by examining the

Table 6.2 Learning attainment by case suppliers

Supplier	Starting level		Level of most advanced activities		Number of years in chain
	Equipment-related	Production management	Equipment-related	Production management	
(a) Learning in Japanese chains					
A1	Operational	Operational	Adaptive	Adaptive	14
A2	Operational	Operational	Adaptive	Assimilative	14
A3	Operational	Operational	Assimilative	Assimilative	14
A4	Operational	Operational	Assimilative	Operational	9
A5	Below operational	Operational	Operational	Adaptive	9
A6	Operational	Operational	Assimilative	Assimilative	9
A7	(n/a)	(n/a)	Assimilative	Assimilative	6
A8	Operational	Operational	Operational	Operational	8
A9	Operational	Operational	Assimilative	Operational	11
A10	Operational	Operational	Operational	Operational	9
A11	Operational	Operational	Assimilative	Assimilative	6
B1	Operational	Operational	Assimilative	Assimilative	7
B2	Operational	Operational	(No event)	Assimilative	5
B3	Operational	Operational	Operational	Operational	6
B4	Operational	Operational	Assimilative	Operational	12
B5	Operational	Operational	Operational	Operational	5

(continued)

Table 6.2 (continued)

Supplier	Starting level			Level of most advanced activities			Number of years in chain
	New product introduction	Equipment-related	Production management	New product introduction	Equipment-related	Production management	
(b) Learning in Vietnamese-Chinese chains							
B1	Operational	Operational	Operational	Operational	(No event)	(No event)	4
B2	Operational	Operational	Operational	(No event)	Operational	(No event)	1
B3	Operational	Operational	Operational	Operational	Operational	Operational	4
B4	Operational	Operational	Operational	Adaptive	(No event)	(No event)	9
B5	(n/a)	(n/a)	(n/a)	(No event)	Operational	Operational	7
C1	Operational	Operational	Operational	Operational	Operational	Operational	10
C2	Operational	Operational	Operational	Operational	Operational	Operational	9
C3	Operational	Operational	Operational	Operational	Operational	(No event)	10
C4	(n/a)	(n/a)	(n/a)	Operational	(No event)	Operational	5
C5	(n/a)	(n/a)	(n/a)	Operational	(No event)	Operational	4

Notes

[a] *No event* denotes that the supplier did not experience any major learning event in the respective chain signifying the acquisition of the respective type of capability in the respective stage of industrial development

[b] For suppliers A7, B5, C4 and C5, the starting level could not be identified because their business start-up coincided with their entry into the respective value chain

Source Prepared by the author on the basis of interviews with the suppliers

learning trajectories of suppliers that started motorcycle component production in Japanese chains (Group A suppliers). It then proceeds to analysis of the learning trajectories of suppliers that started motorcycle component production in Vietnamese–Chinese chains, including those that ultimately transferred to Japanese chains (Group B suppliers) and those that remained in Vietnamese–Chinese chains (Group C suppliers).

6.3.1 Suppliers Initiating Motorcycle Component Production in Japanese Value Chains (Group A)

Figure 6.1 maps the sequence of learning events experienced by Group A suppliers. Each event is numbered and shows the level and functional category of capability acquired by each supplier.

Of the 30 learning events identified by Group A suppliers, 25 took place principally in activities in Japanese chains, and the remaining five occurred in activities in other chains. This means that each Group A supplier experienced a series of learning events in a Japanese chain. Once a supplier had entered a Japanese chain, it tended to remain there for the long term, gradually improving equipment-related and/or production management capabilities.

In respect of the timing of learning events in Japanese chains, they were scattered throughout the three stages of industrial development, but Stage III transpired to be particularly significant in terms of both the number of events and levels of capability attained. Indeed, the levels of capability reached during the first two stages tended to be rudimentary. Figure 6.1 shows that instances of progress towards the assimilative level up to Stage II were limited to the process design dimension of A2's equipment-related capability and A5's production management capability. While the absence of learning events in some suppliers in earlier stages (e.g., supplier A1 in Stage II) does not deny the absence of learning during the respective stage, any learning that did take place in Stage I or Stage II is expected to have been less significant than that which took place in Stage III.

It is only in Stage III that we start to observe suppliers acquiring an adaptive level of production capability. It is also in Stage III that most sampled suppliers of the first-tier reached the assimilative level. While this finding cannot be generalised to local first-tier suppliers in HVN's value chains at large, it is consistent with HVN's assessment that, apart from a number of cases, its local suppliers were generally able to reach the company's requirements without hands-on technical assistance (interview #5)—which by definition is equivalent to the assimilative level—by 2006–08.

Stage III transpired to be a period of major leaps in capability level for several high-performing suppliers as they responded to challenging performance targets in terms of quality, costs and delivery (QCD) that HVN came to impose on its suppliers. A1, a first-tier supplier of plastic components, is a typical example. In

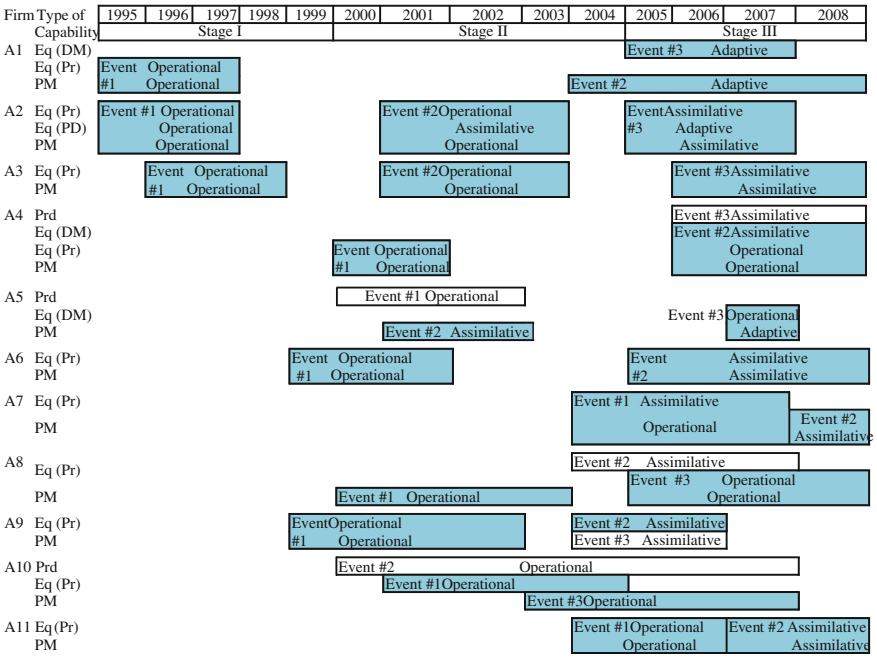

Fig. 6.1 Capability building trajectories of suppliers in Group A. *Notes* [a]Types of capability are abbreviated as follows: *Prd* new product introduction capability; *Eq (Pr)* processing precision dimension of equipment-related capability; *Eq (PD)* process design dimension of equipment-related capability; *Eq (DM)* dies and moulds dimension of equipment-related capability; *PM* production management capability. [b]Cells denoting events are shaded as follows: *light shaded* events in Japanese chains; *dark shaded* events in Vietnamese–Chinese chains; *unshaded* events in other value chains. *Source* The author's interviews

Stage III, both equipment-related and production management capabilities of this supplier reached the adaptive level. It learned to design and manufacture plastic moulds for a variety of complex components to a degree of proficiency equivalent to the adaptive level of capability (Event #3). In 2006, A1 was recognised by HVN as a supplier of plastic moulds, which allowed the former to design and manufacture moulds not only for its own use but also for HVN's other suppliers of plastic components. A1 also implemented organisational improvement that enhanced its levels of production management in order to satisfy the increasingly challenging QCD targets set by HVN (Event #2).

Likewise, suppliers A2 and A5 also experienced critical learning events in Stage III; however, the functional types of capability in which *leaps* took place differed across suppliers. A2 made its most influential changes in the domain of the process design dimension of equipment-related capability. The supplier managed to systematically and consistently make its own adaptations to production

processes and equipment in order to enhance its QCD performance (Event #3). On the other hand, A5 focused its learning on production management. In response to stringent cost reduction targets and new environmental standards imposed by HVN, this supplier developed and instituted its own quality management standards within its own factory as well as those of second-tier suppliers supplying metal and plastic sub-components (Event #3).

Yet, for some suppliers, Stage III transpired to be a period of slower or even stalled learning. For example, A4 became a first-tier supplier of plastic components to HVN four years after A1. To begin with, A4 learned to process relatively simple plastic components—using moulds provided by HVN—to the required precision and QCD levels (Event #1). However, similar starting points notwithstanding, the learning performance of A4 lagged behind that of A1. As of Stage III, A4 was only capable of designing and manufacturing moulds for its own use (Event #2), while its production management capability remained at the operational level. This apparent lack of progress seems to have been due at least in part to A4's diversification from about 2005 to accommodate other unrelated fields in terms of both manufacturing (i.e., producing plastic toys for export to Europe) (Event #3) and non-manufacturing (i.e., real estate and logistics).

For intermediate suppliers, Stage III was a period of accelerated learning compared to previous stages but not to the extent of the major leaps observed in high-performing suppliers. For example, A3 improved its levels of precision and production management sufficiently to meet HVN's increasingly demanding requirements (Event #3). A7 also improved levels of precision in dies and moulds, and stepped up its production and delivery management to meet the increasing quantities of orders placed by HVN and its first-tier suppliers (Event #2). Through such events, these suppliers progressed from the operational level to the assimilative level for either or both equipment-related and production management capabilities, but failed to go beyond that.

6.3.2 Suppliers Initiating Motorcycle Component Production in Vietnamese–Chinese Value Chains (Groups B and C)

Figure 6.2 shows the sequence of learning events that took place in the 10 suppliers in Groups B and C. Only 11 of the 26 learning events experienced by these firms took place principally in Vietnamese–Chinese value chains. This means that much of the learning undertaken after entry into Vietnamese–Chinese chains took place in other value chains. In terms of the timing, events were concentrated in Stage II—the early years of suppliers' participation in Vietnamese–Chinese chains. Unlike suppliers in Japanese chains, initial acquisition of new capabilities by these groups of suppliers was not followed by impetus towards progressively

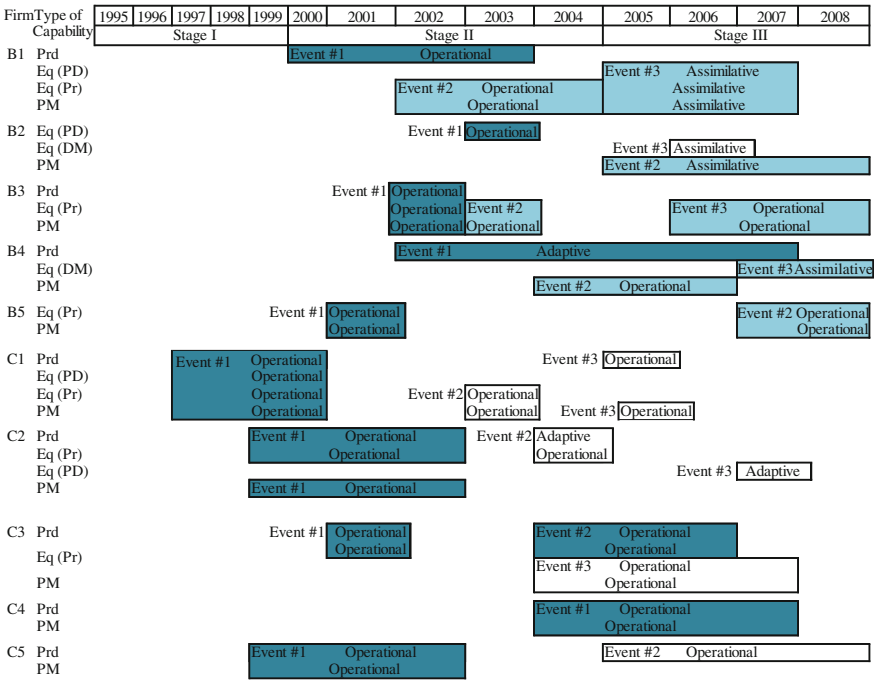

Fig. 6.2 Capability building trajectories of suppliers in Groups B and C. *Notes* [a]Types of capability are abbreviated as follows: *Prd* new product introduction capability; *Eq (Pr)* processing precision dimension of equipment-related capability; *Eq (PD)* process design dimension of equipment-related capability; *Eq (DM)* dies and moulds dimension of equipment-related capability; *PM* production management capability. [b]Cells denoting events are shaded as follows: *light shaded* events in Japanese chains; *dark shaded* events in Vietnamese–Chinese chains; *unshaded* events in other value chains. *Source* The author's interviews

higher levels of capability. Moreover, levels of capability acquired in Vietnamese–Chinese chains remained largely rudimentary.

With the exception of B4, no Group B or Group C supplier progressed beyond the operational level in any of the functional categories of capability as a result of learning events in Vietnamese–Chinese chains. In terms of new product introduction activities, these suppliers mostly replicated existing products—either from samples provided by customers or standardised products available on the domestic market—failing to make their own adaptations to existing product designs that incorporated significant functional, qualitative or cosmetic improvements. Likewise, their equipment-related and production management activities tended to remain at the rudimentary level.

What happened to Group B and C suppliers in Stage III? Most switched their focus away from Vietnamese–Chinese chains. All Group B suppliers entered Japanese chains as first- or second-tier suppliers whilst concluding their involvement in Vietnamese-Chinese chains. However, there was an exception. B4 did not leave its Vietnamese–Chinese chain entirely and continued to operate simultaneously in Japanese and Vietnamese–Chinese chains. Group C suppliers generally shifted the relative weight of their operations to other value chains. Again, C3 and C4 did not leave their Vietnamese–Chinese chains completely, and continued to operate simultaneously in these and other value chains.

After transferring to Japanese chains in Stage III, Group B suppliers experienced learning patterns similar to the Group A firms discussed above. The former improved equipment-related and/or production management capabilities in their new Japanese chains, although the degrees of improvement varied across suppliers. B1, B2, and B4 reached the assimilative level for equipment-related and/or production management capabilities, while B3 and B5 failed to progress beyond the operational level for these types of capability.

Only three suppliers originally in groups B and C—namely, B4, C3 and C4—continued to operate in Vietnamese–Chinese chains into Stage III. Of these, B4 alone managed to attain an adaptive level of new product introduction capability. The most important learning event for B4 started in Stage II in a Vietnamese–Chinese chain and was consolidated in Stage III. Whereas this supplier merely replicated samples provided by local assemblers or produced components according to standardised designs in the early years, it gradually started to make its own cosmetic and functional modifications to such designs on behalf of local assemblers (Event #1). Cosmetic modifications aimed at meeting rapidly changing consumer preferences were frequent. Although much less frequent, B4's functional modifications culminated in 2008 in the launch of an innovative silencer design that complied with new government policy which required the meeting of Euro 2 emission standards.[4]

The frequent launching of new models reflecting the latest market trends and policy requirements enabled B4 to maintain sales to local assemblers even into Stage III. Conversely, neither C3 nor C4 succeeded in improving their capabilities beyond the operational level. C3 failed to achieve substantial improvements in the routine operational capabilities it had acquired upon entry into a Vietnamese–Chinese chain in Stage II (Event #1). And C4, a late entrant into a Vietnamese–Chinese chain, experienced a learning event in Stage III but only succeeded in reaching the operational level of new product introduction and production management capabilities.

[4] Interview with B4 #1. The Vietnamese government implemented Euro 2 emission standards for motorcycles from July 2007 (Prime Minister's Decision 249/2005/QD-TTg dated 10 October 2005).

6.4 Conclusion

This chapter explored the *how* question regarding supplier learning trajectories. It began by broadly confirming the findings of previous research that the type of capability acquired is associated with a certain type of value chain, but it went further in examining the sequence of learning events experienced by the case suppliers, showing that supplier learning in the Vietnamese motorcycle industry was indeed an extended process consisting of major leaps, slow progress and/or halted learning. One of the most important findings was the importance of Stage III as the most dynamic period of learning regardless of the type of motorcycle value chain in which individual suppliers operated. When looked at from the medium-term perspective, the Stage II learning attainments emphasised in the existing literature were revealed to be relatively modest.

In terms of suppliers that initiated motorcycle component production in Japanese chains, it was found that the acquisition of equipment-related and/or production management capabilities tended to progress slowly up to and including Stage II. This was followed by a divergence in learning performance in Stage III, whereby some suppliers experienced major leaps towards the basic innovative level while others saw their learning stall.

In respect of suppliers that initiated motorcycle component production in Vietnamese–Chinese chains, learning focused on the acquisition of routine capabilities covering wider functional categories in the early years of chain participation. Again, it was in Stage III that a growing divergence in learning performance across suppliers became apparent. While learning in Vietnamese–Chinese chains slowed down or even halted in most suppliers, one, B4, attained an adaptive level of new product introduction capability that helped the supplier to maintain and even expand its sales to local assemblers throughout Stage III.

The remaining question is how the evolving trajectories of supplier learning can be explained. This will be the subject of the following two chapters.

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Chapter 7
Learning Models in Japanese and Vietnamese–Chinese Chains up to the Early 2000s: An Aggregated Analysis of Learning Events

Abstract The empirical analysis of the roles of the key actors in supplier learning reveals that two contrasting patterns of actor constellations and modes of actor involvement emerged by the early 2000s. On one hand, the Japanese model of supplier learning combined active lead firm interventions and supplier mobilisation of internal learning sources in accordance with lead firm requirements. On the other hand, the Vietnamese–Chinese learning model was based primarily on the supplier's own initiative in the mobilisation of internal sources of knowledge.

Keywords Supplier · Capability building · Value chain · Actor constellation · Knowledge flow

Having analysed *how* supplier learning trajectories evolved over time, we now turn to the question of *why* learning trajectories evolved in the ways they did. The research question is:

What actor constellations and what knowledge flows led to critical learning events?

In exploring this question, this chapter and Chap. 8 attempt to explain supplier learning trajectories in terms of the roles of the key actors: suppliers themselves, lead firms and other external actors. In endeavouring to explain the fundamental differences in the learning patterns between Japanese and Vietnamese–Chinese chains, this chapter outlines two contrasting models of supplier learning in their original forms as they emerged in stages I and II. This is done by engaging in aggregated analyses of learning events in Japanese and Vietnamese–Chinese chains.

7.1 Contrasting Actor Constellations in Japanese and Vietnamese–Chinese Chains

The first step in enumerating the key features of the two learning models lies in identifying those actors that operated as important sources of supplier learning. Table 7.1 shows the most important and second most important actors in the

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Table 7.1 Key actors in learning events

Stage	Firm	Event #	Key actors	
			Most important	Second most important
(a) Learning events at the first tier of Japanese chains				
I	A1	1	Supplier itself	Customer (HVN)
	A2	1	Supplier itself	Customer (HVN)
	A3	1	Supplier itself	Customer (HVN)
II	A2	2	Supplier itself	Customer (HVN)
	A3	2	Supplier itself	Customer (HVN)
	A4	1	Supplier itself	Customer (HVN)
	A5	2	Supplier itself	Customer (HVN)
	A6	1	Supplier itself	Customer (HVN)
	B1	2	Supplier itself	Customer (HVN)
III	A1	2	Supplier itself	None
	A1	3	Supplier itself	Customer (HVN)
	A2	3	Supplier itself	Customer (HVN)
	A3	3	Supplier itself	Customer (HVN)
	A4	2	Supplier itself	Other external actor (Vietnamese provider of software)
	A5	3	Supplier itself	Other external actor (related company)
	A7	2	Supplier itself	Other external actor (related company)
	A8	3	Supplier itself	Customer-designated unit (Japanese partner designated by HVN)
	B1	3	Supplier itself	Customer (HVN)
	B2	2	Supplier itself	Customer (HVN)
(b) Learning events at the second tier of Japanese chains				
II	A8	1	Supplier itself	Other external actor (Japanese aid organisation)
	A9	1	Supplier itself	Customers (Japanese first-tier suppliers)
	A10	1	Supplier itself	Customers (Japanese motorcycle manufacturers and their first-tier suppliers)
	B3	2	Supplier itself	Customer (Japanese first-tier supplier)
III	A6	2	Supplier itself	Customer and customer-designated unit (Japanese first-tier supplier and a partner designated by HVN)
	A7	1	Supplier itself	Customer (HVN)
	A9	2	Supplier itself	Customers (Japanese first-tier suppliers)
	A10	3	Supplier itself	Customers (Japanese motorcycle manufacturers and their first-tier suppliers)
	A11	1	Supplier itself	Customers (Japanese first-tier suppliers)
	A11	2	Supplier itself	Customers (Japanese first-tier suppliers)
	B3	3	Supplier itself	Customer (Japanese first-tier supplier)
	B4	2	Supplier itself	Other external actors (visited and observed factories in Japan)
	B4	3	Supplier itself	Other external actors (machinery providers)
	B5	2	Supplier itself	Other external actor (Japanese aid organisation)

(continued)

Table 7.1 (continued)

Stage	Firm	Event #	Key actors	
			Most important	Second most important
(c) Learning events in Vietnamese–Chinese chains				
I	C1	1	Supplier itself	None
II	B1	1	Supplier itself	None
	B2	1	Supplier itself	None
	B3	1	Supplier itself	None
	B5	1	Supplier itself	Other external actor (Chinese partner)
	C2	1	Supplier itself	Other external actors (visited and observed factories in Taiwan)
	C3	1	Supplier itself	None
	C5	1	Supplier itself	Other external actor (Russian partner)
III	B4	1	Supplier itself	Customers (local assemblers)
	C4	2	Supplier itself	Customers (local assemblers)
	C5	1	Supplier itself	Customers (local assemblers)

Source Prepared by the author on the basis of interviews with the suppliers

44 learning events that took place in Japanese and Vietnamese–Chinese chains as identified by the suppliers.

All firms ranked their own activities as the most important source for all the events they experienced regardless of the type of value chain in which they took place. Whilst suppliers' self-evaluation of their own roles should be interpreted with caution as managers tend to insist on the value of their own achievements, this finding is consistent with the conclusion in the TC literature that firm-level capability building is ultimately determined by deliberate investment in specialised, innovative activities undertaken by firms themselves as the agents of learning (Bell and Pavitt 1995).

However, important differences emerged in the role of lead firms. These companies were found to be extremely important in learning events in Japanese chains, especially in the earlier stages of industrial development. The lead firm was identified as the second most important actor in terms of all learning events that took place principally in Japanese chains during stages I and II. Conversely, lead firms played a minimal role in learning events in Vietnamese–Chinese chains, particularly during the early years of industrial development. In none of the learning events that took place in Vietnamese–Chinese chains in stages I and II was a lead firm chosen as the second most important actor. Indeed, in more than half of these events, suppliers stated that they were the only actors involved.

These very different actor constellations in Japanese and Vietnamese–Chinese chains point to two contrasting models of supplier learning: the Japanese model, which involves active roles played by both the lead firm and the supplier; and the Vietnamese–Chinese model, in which learning is achieved principally through the supplier's own volition.

In order to explore the two models in depth, it is necessary for the analysis to reach beyond actor constellations to examine the specific modes of actor involvement and knowledge flows between the actors. Since the above discussion suggests that contrasts between the two models can be observed more clearly in stages I and II than in Stage III, the remainder of this chapter searches for similarities across learning events in the same types of value chains, with the aim of illuminating the key features of the original Japanese and Vietnamese–Chinese learning models as they emerged in stages I and II.

7.2 Lead Firm-Driven Learning Model in Japanese Chains

Table 7.2 shows the fieldwork results concerning the roles played by key actors in learning events. The columns indicate the type of value chain and the period in which each learning event took place, and the rows depict the types of actor involvement in supplier learning based on the framework presented in Chap. 4. Consistent with the discussion in Sect. 7.1, lead firms played an extensive role in supplier learning in Japanese chains during stages I and II. The following analysis focuses on first-tier suppliers, to which the Japanese learning model applies particularly well.

7.2.1 The Lead Firm

Table 7.2 shows that the role of the lead firm extended over three domains of involvement in supplier learning: inducement, direct and indirect knowledge transfer, and monitoring. *Inducement* was found to be critical in promoting supplier capability building. In all learning events that took place at first-tier suppliers in Japanese chains, product specifications and so-called QCD requirements were identified by suppliers as the key drivers of capability building. Lead firms provided suppliers with detailed drawings, including technical parameters. Annual and monthly production plans were also provided to allow suppliers to set investment and production targets.

The reason why HVN provided detailed specifications to its suppliers was because of the company's emphasis was on launching its own sophisticated models developed at home and manufacturing them locally to high quality standards. In the 1990s, HVN launched two models in Vietnam, both of which carried proprietary (and thus non-standard) designs developed at the company's R&D headquarters in Japan.[1] HVN's emphasis at this stage was clearly not on price

[1] This discussion of models launched in the 1990s is based on an interview with HVN #2.

Table 7.2 Sources of learning in 44 learning events (Unit: number of events)

Actors	Modes of involvement		Japanese chains (first tier)				Japanese chains (second tier)			Vietnamese–Chinese chains			
			Total	Stage I	Stage II	Stage III	Total	Stage II	Stage III	Total	Stage I	Stage II	Stage III
Lead firm (or companies designated by lead firm)	Inducement	Product specifications and QCD requirements	19	3	6	10	13	3	10	3	0	0	3
		Providing dies and moulds	5	3	1	1	4	1	3	0	0	0	0
	Direct knowledge transfer	Technical advice and training	10	3	5	3	6	2	4	0	0	0	0
		Troubleshooting	14	3	5	6	4	1	3	0	0	0	0
	Indirect knowledge transfer	Learning by observing	4	0	2	2	2	1	1	0	0	0	0
	Monitoring	Testing and feedback from lead firm:											
		(a) Providing results only	0	0	0	0	2	1	1	2	0	0	2
		(b) Giving reasons	0	0	0	0	6	1	5	0	0	0	0
		(c) Follow-up on measures taken to overcome problems	18	3	6	9	5	2	3	0	0	0	0
		Factory audit	19	3	6	10	9	4	5	0	0	0	0
Supplier		Investment in machinery and equipment	13	2	4	7	10	3	7	6	1	3	2
		In-house improvement/R&D in new product introduction	0	0	0	0	0	0	0	2	0	0	2
		In-house improvements/R&D in production	9	3	2	6	4	2	2	5	0	3	2
		Organisational change	14	1	5	8	5	2	3	1	0	0	1
Other external actors		Foreign organisations: technical advice and training	5	0	1	4	5	2	3	2	0	2	0
		Domestic organisations: technical advice and training	2	0	0	2	0	0	0	0	0	0	0
		Recruiting individuals/mobility of human resources	5	1	2	2	1	0	1	0	0	0	0
		Foreign-invested companies in Vietnam or companies located abroad: learning by observing	2	0	1	1	4	1	3	3	0	3	0
Total number of learning events			19	3	6	10	14	4	10	11	1	7	3

Source Fujita (2012:122), prepared on the basis of the author's interviews with suppliers

competitiveness, the two models launched in the 1990s being priced as high as US$2,000.[2]

As HVN launched the low-price model, the Wave Alpha, in the early 2000s, the company's requirements on suppliers shifted to price reduction. The author's interviews with four of Japanese suppliers serving HVN since the late 1990s found that demands were placed on them to achieve price reduction between 40 and 50 %—the level far beyond the targets achieved by routine incremental improvements in productivity (Fujita 2013: 40). This, however, did not mean that quality and delivery were no longer important. Whilst Honda did reduce its product specifications to the levels considered necessary for the Vietnamese market,[3] suppliers were still required to manufacture components in accordance with the detailed drawings.

Clearly defined specifications enabled the supplier to identify the gap between its current level of manufacturing capability and lead firm requirements, thus enabling it to set appropriate learning goals. Lead firm provision of dies and moulds was also important in the early years of transactions with local suppliers as a means used by HVN to ensure the requisite levels of precision; all learning events that took place in first-tier suppliers in Stage I being facilitated by such provision. Accordingly, the first important step for suppliers in accumulating equipment-related capability was in studying dies and moulds provided by lead firms and learning to conduct appropriate maintenance of them.

However, viewed from a different angle, the provision of detailed specifications was also a constraint to supplier learning. The fact that detailed drawings for Honda's models to be launched in Southeast Asia were developed at the company's R&D centres in Japan and/or Thailand meant that there was virtually no scope for suppliers in Vietnam—regardless of nationality—to participate in product development.[4] Consequently, HVN's requirements of its suppliers centred on processing of components precisely in accordance with the drawings and specifications provided, which basically boiled down to meeting QCD targets (interview with HVN #4).

As an illustration of Honda's evaluation criteria for prospective suppliers, Table 7.3 shows the types of capabilities the company expected of its suppliers. Apart from a few management-related expectations, the majority of requirements are related to production management and equipment-related activities, which were the major channels via which suppliers sought to improve QCD levels.

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[2] The prices were US$1,990 and US$2,044 respectively (Nguyen 2004: 234).

[3] For example, the maximum driving speed applied in defining product and process parameters for the Wave Alpha was set at 80 km/h. Even though this was much lower than standard levels applied to Honda's other overseas markets, it was considered sufficient for use in the Vietnamese context where traffic congestion prevented motorcycle use at higher speeds (Amano and Shintaku 2010: 799).

[4] Up to the early 2000s, the bulk of R&D activities in respect of models to be launched in Southeast Asia were conducted in Japan, but they were gradually relocated to the R&D base in Thailand from the turn of the century (interview with Honda R&D Southeast Asia #1).

Table 7.3 HVN criteria for supplier evaluation

Quality	Quality targets, standardised quality control, testing standards, working standards
Costs	Consciousness of cost, unambiguity of quotations, proactivity in reducing production costs, 3S[a]
Delivery	Smooth flow of production lines, management of production plans and performance, management of orders and delivery, inventory management
Development	Maintenance and manufacture of dies and moulds, own/proprietary production technology, value engineering proposals
Management	Business mind, proactive attitude towards improving productivity, resolution of labour disputes (e.g. strikes), promotion of good working attitude amongst employees

Notes [a] 3S is a Japanese management system comprising: Seiri = orderliness; Seiton = neatness; and Seiso = cleanliness

Source Presentation by HVN's director in charge of procurement at the Seminar on Vietnam-Japan Supporting Industry Business Promotion hosted by JETRO, the SME Technical Assistance Center, and JICA and held at Melia Hotel, Hanoi, on 22 January 2007

Although there is a criterion termed "development", specific requirements suggest that suppliers were expected to produce and maintain dies and moulds and to manufacture components in accordance with design drawings provided by HVN rather than develop their own component designs. Such lead firm demands explain why supplier learning in Japanese chains concentrated so much on these two functions and did not extend to new product introduction.

Monitoring by lead firms was also found to be vital to all learning events in first-tier suppliers in Japanese chains, including those in Stage III. A critical point to note is that monitoring took the form of what Schmitz (2006: 566) refers to as "detailed monitoring". If components delivered to HVN did not reach the required standard, the company not only returned them to the supplier but also informed it of the reasons for rejection and requested the taking of both immediate and permanent measures to overcome the problem (interview with HVN #4). The progress of implementation was also monitored. As the general director of A3 pointed out in relation to its first learning event: "[HVN] provide us with *training* in the context of production…for instance, [in the form of] inspection and advice" (interview with A3 #1).

Direct and indirect knowledge transfer also played a role in helping suppliers to reach the requisite QCD and precision levels, which were often substantially higher than standards prevailing in the local market. Direct knowledge transfer was identified as an important source of learning in all events other than one in stages I and II. Its importance was particularly emphasised by the three firms that HVN engaged as first-tier suppliers in Stage I. Prior to signing formal supply contracts, these suppliers were repeatedly visited by lead firm experts over a period of up to a few years (interviews with A2 #1; A3 #1). These experts provided hands-on advice and training directly to managers in suppliers' factories (interview with A3 #1). In instances of unexpected trouble in particular, lead firm experts were usually dispatched to assist. The general managers of A1 and A2 pointed out that troubleshooting was a joint initiative in which the supplier and the lead firm

worked together to determine the cause of a problem and find a solution (interviews with A1 #4 and A2 #1).

Similar remarks were made by a number of companies that were engaged as first-tier suppliers to HVN in Stage II in respect of first learning events in Japanese chains (Events #1 of A4, A6 and B1). In relation to its first learning event, A6's general director noted: "They offered a lot of assistance…especially in implementing quality control systems… From 2001 to 2003, they [Honda experts] visited us so often that I've lost count" (interview with A6 #2).

As noted above, there was an exception. In relation to its first learning event, A5 remarked that the lead firm came to inspect the factory and tested samples but did not provide any direct assistance. There are two possible explanations for this. The first has to do with the type of component. This supplier produced wire harnesses that required relatively simple assembly operations for which there were a number of alternative suppliers. Second, A5 had attained the necessary skill level in production management for suppliers of this type of component through its previous experience of exporting wire harnesses to Japan (interview #1).

7.2.2 The Supplier

Although the lead firm undoubtedly played a vital role in the Japanese learning model, it is clear that the kinds of interventions discussed above do not directly result in suppliers attaining a capability level that enables them, for example, to process products with higher levels of precision or to implement sophisticated production management techniques. It was the supplier's own mobilisation of internal knowledge sources that directly led to the accumulation of firm-level capabilities. In the words of the chairman of supplier A1 (as of the date of the interview) who served as the general director of the company from 1995 to 2008, "Our internal capacity is the main [driver of capability building]" (interview with A1 #3).

Even when the lead firm provided generous assistance, Japanese experts did not supervise suppliers' day-to-day operations. It was left to suppliers to work out how advice and instructions could be applied to routine operations:

> [The Japanese expert] did not stay continuously. He set requirements [concerning production, quality management, or equipment] as the situation demanded… He only gave us *homework* to do. If we were able to do it [by his next visit], he gave us more work to do. In this way, he assisted us to gradually upgrade each time he visited us. The Japanese worked with us in this way.
>
> (interview with B1 #1 on Event #2)

As shown in Table 7.2, suppliers' internal knowledge mobilisation included investment in machinery and equipment, in-house improvements in production, and organisational changes. In all learning events experienced by first-tier suppliers in stages I and II, they identified the most important learning source as

various combinations of these internal sources. However, at this stage, the mobilisation of internal sources entailed limited innovative activities on the part of the supplier.

First, supplier-side activities concentrated principally on trial-and-error efforts to improve manufacturing processes and production management practices following the advice of Japanese experts. The general director of A2 explained how the company qualified as an official supplier to Honda (Event #1):

> The process was very long; we finally succeeded after three trials…. At that time, [HVN] did not assist us. We had to work on our own initiative, that is, [we needed to] respond to HVN's specifications and requirements by coming up with the products (interview with A2 #1).

Second, where physical investments were made, they tended to be small in scale. For example, A2 was only able to invest in a few second-hand Japanese lathes and Chinese stamping machines due to financial constraints (interview #1).

7.2.3 External Actors Other than the Lead Firm

The mobilisation of internal learning sources was sometimes facilitated through external sources other than lead firms, such as production management experts dispatched from a Japanese training organisation (Event #1, A6), production management training programmes organised by a Vietnamese organisation (Event #2, A3) and supplier employee visits to Taiwan, Thailand or China to observe factories in similar industries (Event #1, A4).

Nevertheless, as far as learning events during stages I and II were concerned, such external sources were not as important as internal sources or the supplier's lead firm (Table 7.1). This suggests that these external sources played a complementary role rather than a critical role in supplier capability building.

7.3 Suppliers' Independent Learning in Vietnamese–Chinese Chain

In Vietnamese–Chinese chains, the pattern of actor involvement in supplier learning was found to be markedly different from that in Japanese chains. Consistent with the discussion in Sect. 7.1, Table 7.2 shows the critical role played by suppliers in Vietnamese–Chinese chains themselves. The following sub-sections discuss the roles of key actors in this learning model.

7.3.1 The Lead Firm

No evidence was found of learning events during stages I or II in which a lead firm had played a key role; none of the suppliers remarked that they had ever received direct technical assistance from lead firms in relation to any learning events. Specifications and requirements stipulated by lead firms were only vaguely defined and thus failed to provide incentives or targets for supplier learning.

In the case of engine components, Honda's two models[5] were widely shared within the industry as de facto standards, as discussed in Chap. 2. Lead firms therefore placed orders by merely stating required components without providing any samples, design drawings or other specifications. Suppliers of engine parts explicitly stated that they adopted a single preconfigured design for all their customers (interviews with B5 #1; C2 #2). In terms of other components, specifications were commonly provided in the form of samples for suppliers to replicate; yet even in such cases, neither detailed written specifications nor parameters were provided (interviews with B1 #1, B3 #2, C1 #1, C5 #1).

Vaguely defined specifications also meant that lead firm monitoring was largely non-existent. Although there were instances in which local assemblers returned faulty components asking the supplier to make adjustments, they did not constitute acts of lead firm assistance, as was the case in Japanese chains. Rather, it was a reflection of the lead firm's inability to coordinate product parameters around de facto standard models.

As discussed in Chap. 2 in relation to the Chinese motorcycle industry, to the extent that motorcycles had integral product architecture, de facto standardisation based on uncoordinated duplicative imitation of popular models—frequently employing different measurement methods and degrees of precision in recreating design drawings—was at best a partial method of ensuring component compatibility. Local suppliers pointed out that assemblers returned their components when they found them to be incompatible with adjacent ones, a problem that occurred primarily because assemblers arbitrarily switched suppliers according to price (interviews with B1 #1; B3 #2; B4 #1; B5 #1; C3 #2). These instances were typically dealt with by ad hoc, ex post adjustments by suppliers with the sole intention of making the components *assemblable*. Suppliers were asked by customers to modify components once delivered as they were incompatible with adjacent parts (interviews with B1 #1; B3 #2). Nevertheless, similar to the case of the Chinese motorcycle industry discussed in Chap. 2, such piecemeal modifications fell short of ensuring full component compatibility, and resulted in products that were inferior in quality and performance to the original models (Fujita 2013).

In short, the way lead firms engaged with their suppliers failed to provide them with targets or incentives for learning. However, this also implies that lead firms did not limit the scope of supplier activities. Unlike Japanese chains, suppliers in

[5] The two models, *Dream* and *Wave*, carried C100 and C110 engines, respectively (Fujita 2013: 56).

Vietnamese–Chinese chains were not constrained in terms of engaging in new product introduction activities, for example, making modifications to existing component designs, although few suppliers exploited such opportunities in stages I or II.

7.3.2 The Supplier

Table 7.2 shows that supplier learning in Vietnamese–Chinese chains was largely a result of the mobilisation of internal knowledge sources on the supplier's own initiative. In-house improvements in new product introduction, equipment-related activities, or organisation were found to constitute the main sources of learning in most events.

New product introduction activities concentrated mainly on the reverse engineering of either samples provided by lead firms or products available on the domestic market by measuring samples, analysing the materials used, and recreating design drawings.

Production activities focused mainly on setting up production lines and maintaining the manufacture of components. In some events, investment in additional machinery and equipment was undertaken, particularly by suppliers that had only recently commenced production activities (interviews with C4 #1; C5 #1), or those that had previously only produced relatively simple items such as bicycle parts (interviews with C1 #1; C3 #1).

7.3.3 External Actors Other than the Lead Firm

In some events, external sources of knowledge other than the lead firm also played key roles by complementing internal learning sources, particularly where suppliers only had limited internal resources. Two suppliers received direct technology transfer from abroad. In initiating component production, B5 entered into a technology transfer agreement with a Chinese partner, who provided engineers, design drawings, dies, machinery and equipment, subcomponents and materials. The Chinese engineers remained on site at B5's factory throughout the period of the contract, which extended over seven years, to assist with machinery operation (interviews #1, #2). Similarly, C5 entered into a technology transfer contract with a Russian partner in order to produce motorcycle chains (interview #1).

Some suppliers exploited knowledge gained from observing manufacturers abroad. For example, in the early 2000s, B3's general director and chief engineer visited factories in China that produced similar components in order to observe factory layout, types of machinery being used and how the machines were operated (interview #2). Likewise, C2's general director repeatedly visited Taiwan to

observe the type of machinery being used, process design techniques and methods of production management (interview #2).

7.4 Discussion

As a first step in analysing why supplier learning trajectories evolved in the ways identified in Chap. 6, this chapter conducted an aggregated analysis of learning events in terms of learning sources, which focused on the roles of key actors—i.e., lead firms and suppliers. Following the replication logic underlying the case study methodology, this chapter searched for similarities in sources across learning events that took place in the same types of value chains. Two contrasting patterns of actor constellations and modes of actor involvement emerged out of this analysis. These patterns fit particularly well with stages I and II of Vietnamese industrial development, when only a few inconsistent learning events could be identified, all showing clear reasons for their exceptionality.

The basic features of the two contrasting learning models are depicted in Fig. 7.1. The Japanese model combines active lead firm interventions and supplier mobilisation of internal learning sources in accordance with lead firm requirements. A thick one-way flow of knowledge from the lead firm to its suppliers is the most prominent characteristic of this model. The fact that lead firm interventions were aimed at assisting suppliers to reach QCD requirements explains why supplier learning concentrated on equipment-related and production management capabilities. Lead firm involvement in the form of inducement, knowledge transfer, and monitoring functioned as a key driver of supplier learning. Although capability building ultimately depended on the supplier's efforts to mobilise internal knowledge sources, very few of the suppliers sought to manoeuvre into independent or innovative learning activities in stages I to II.

Conversely, the Vietnamese–Chinese learning model is based primarily on the supplier's own initiative in the mobilisation of internal sources of knowledge. Under this model, knowledge flows between the lead firm and its suppliers were extremely limited and invariably not managed in a fashion conducive to the promotion of supplier learning. Limited lead firm involvement in specifying the scope of supplier activities and providing incentives for supplier learning explains why capability building in Vietnamese–Chinese chains extended over a wider scope of functions but remained modest in terms of levels reached.

The learning models have important implications not only for supplier capability formation but also for the lead firm's competitiveness and industrial development. The Japanese model was developed primarily by the lead firms out of their need to mobilise suppliers for launching proprietary models and manufacturing those models to high quality standards. HVN actively conducted inducement and monitoring activities because the proprietary nature of its product called for enforcement of specific product and process parameters over its suppliers. The company also engaged in knowledge transfer because the capabilities

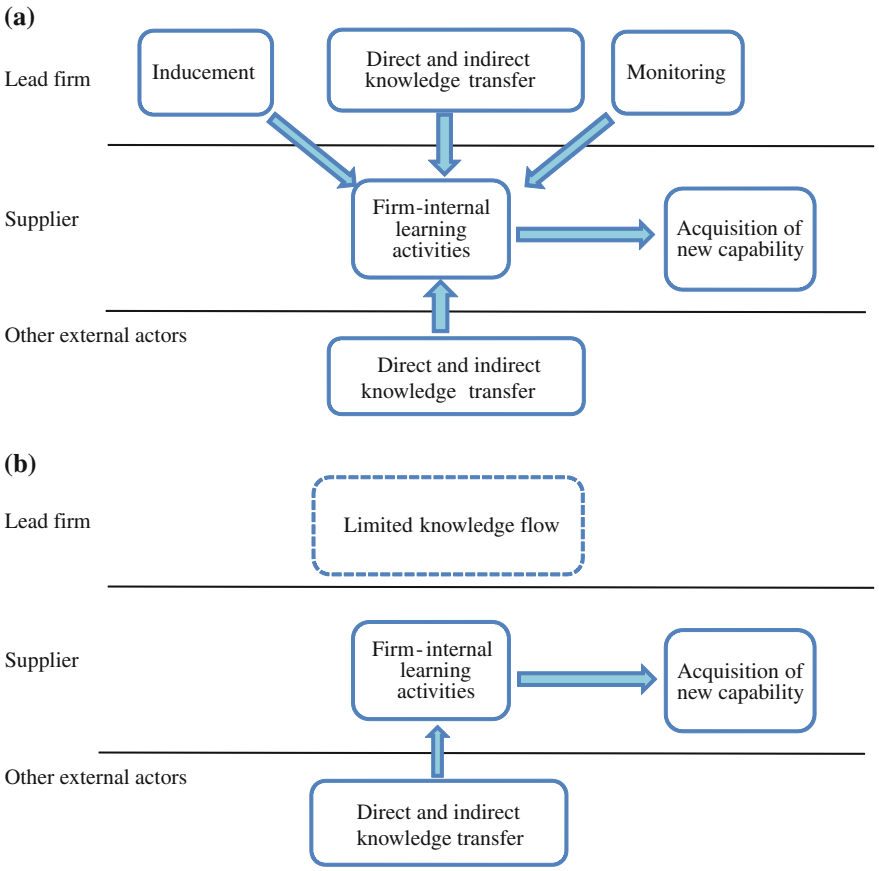

Fig. 7.1 Original supplier learning models in the Vietnamese motorcycle industry (Stage I–Stage II). (**a**) Japanese learning model. (**b**) Vietnamese–Chinese learning model. *Source* Prepared by the author

possessed by the suppliers fell short of its sophisticated product and process requirements. Having emerged as the global industry leader since the 1960s, Honda was equipped with advanced knowledge about products and processes as well as ample experience and know-how in assisting the development of suppliers, accumulated through the company's long history of operations in Japan and overseas. Even though HVN's priority had shifted to radical price reduction with the launching of the Wave Alpha, suppliers were still required to meet Honda-designated product and process specifications, which were often substantially higher than those prevailing locally.

Suppliers made long-term investments in physical and human resources that the product and process requirements called for because the lead firm was committed to long-term relationships with its suppliers, which is clearly manifested by the

repeated visits made by HVN experts to assist the suppliers. The incorporation of new local suppliers to HVN's value chains and the formation of production-related capabilities by these suppliers, in turn, enabled HVN to achieve substantial price reduction whilst adhering to Honda's product and process standards, which helped the company to rapidly recover the market shares that had been lost during the late 1990s to the early 2000s (Fig. 2.1).

The emergence of the Vietnamese-Chinese learning model, in contrast, was not driven by a specific set of actors. Rather, the model emerged endogenously as lead firms and suppliers engaged in arm's-length transactions. Lead firms did not engage in active inducement, knowledge transfer or monitoring. As their priority was on assembling largely standardised products imitating popular Japanese models at competitive prices, they relied primarily on market forces in sourcing components from low-priced suppliers. In any case, local Vietnamese assemblers had limited knowledge about products or production processes, which would have limited their capacity to engage in active inducement, knowledge transfer or monitoring of suppliers even if they wanted to. Consequently, suppliers took their initiative to independently acquire capabilities required to expand their business.

It should be noted, however, that the findings presented in this chapter alone are not sufficient to draw decisive conclusions as to what accounts for the differences between the two learning models, that is, if the prevailing features of the Vietnamese-Chinese learning model have to do with the early stage of the development of firms or the country in which they are embedded, or if this learning model is indeed fundamentally different from the Japanese model. The existing analysis of the Chinese experience seems to suggest that the latter appears to be the case in China, where lead firm-supplier linkages similar to those in Vietnamese-Chinese chains in Vietnam prevailed in the late 1990s (Ohara 2001). Ohara's (2006) analysis shows that even though heightened market competition and regulations introduced by the government compelled Chinese motorcycle manufacturers to increase their product quality in the early 2000s, these lead firms still engaged in limited explicit coordination of their transactions with suppliers and provided very limited technical assistance to their suppliers. This is despite the fact that the Chinese market came to be increasingly dominated by large and powerful motorcycle manufacturers equipped with relatively high levels of knowledge about products and processes. Although the short history of the Vietnamese-Chinese chains does not allow us to conclude whether these chains will eventually evolve in a similar direction, some insights gained from the latest developments in the industry will be discussed in the concluding chapter.

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Chapter 8
Evolution of the Two Learning Models (2005–2008): In-Depth Analysis of Selected Suppliers

Abstract In an attempt to illuminate how the two original learning models identified in the previous chapter changed over time, this chapter conducts an in-depth analysis of selected suppliers. The results show that, by 2008, the Japanese learning model was transformed into two distinct variants, while the Vietnamese–Chinese learning model underwent an important transformation. The changes in learning models were vital to explaining the divergence of learning performance across suppliers in their respective value chains. The analysis corroborates the argument that in analysing the sources of learning, it is essential to ensure a balanced focus on the roles played by *both* the lead firm *and* its suppliers rather than merely emphasising the unilateral actions of either party.

Keywords Supplier · Capability building · Lead firm · Evolution of learning models

This chapter continues to explore why supplier learning trajectories evolved in the ways they did. Having outlined the key features of the two contrasting models of supplier learning in their original forms, the focus turns to how the models changed over time. Given the limitations of the aggregated analysis of learning events in revealing the diverse and even possibly opposing directions of change emerging in Stage III, this chapter relies on an in-depth, comparative analysis of a smaller number of particularly illuminating cases. The focus will be on cases of suppliers participating in the same types of value chains and producing similar types of components but exhibiting different (and even contrasting) learning performance in Stage III.

Section 8.1 examines two distinct directions of change emerging in Japanese chains coordinated by HVN. The suppliers to be analysed in depth are A1, A2, A3 and A4 (Variant 1 of the Japanese model) and A6 and A8 (Variant 2 of the Japanese model). Section 8.2 switches the focus to changes in Vietnamese–Chinese chains. In so doing, it examines B4 and C1, two suppliers of stamped steel

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components that continued to operate in Vietnamese–Chinese chains up to Stage III yet with contrasting learning trajectories.

8.1 Lead Firm-Driven Adjustments to the Japanese Model

In the case of HVN's value chain, the impetus for transformation of the learning model came from the lead firm. Therefore, this sub-section begins by discussing HVN's sourcing practices up to the early 2000s, which sustained the Japanese learning model in its original form (as discussed in Chap. 7) as well as adjustments that HVN sought to implement from 2005 onwards. It then examines two distinct variants of the Japanese learning model emerging out of suppliers' reactions to adjustments in HVN's sourcing practices in Stage III.

8.1.1 Drivers for Change: Adjustments in Lead Firm Sourcing Practices

As discussed in Chap. 7, HVN played an extensive role in assisting the long-term development of its suppliers' production capabilities in stages I and II. Honda's attempt to nurture local suppliers in Vietnam was initiated upon the commencement of local production in the mid-1990s, a strategy the company had developed at its other overseas production bases.

Such moves gained momentum in the early 2000s for two reasons. One was the need to economise radically on component procurement costs as HVN launched a new model in response to the China shock, the Wave Alpha, which was priced at roughly one-third of the company's previous models. The other came in the form of local content rules, which were announced by the Vietnamese government in the late 1990s but fully implemented only after 2001.

These developments combined to prompt HVN to explore new, low-cost sources of components in Vietnam. Given the limited number of Japanese suppliers operating in the country, HVN inevitably had to mobilise non-Japanese suppliers and especially local firms. Where suppliers' capability levels fell short of the company's requirements, HVN offered technical assistance to help them raise their capability levels up to the required standards.

Local suppliers entering HVN's chains were exposed to challenging quality requirements, and stringent cost reduction targets introduced upon the launch of the new model in the early 2000s added further to the pressure. At this stage, however, HVN's power to enforce the requirements it demanded of suppliers was subject to the following limitations.

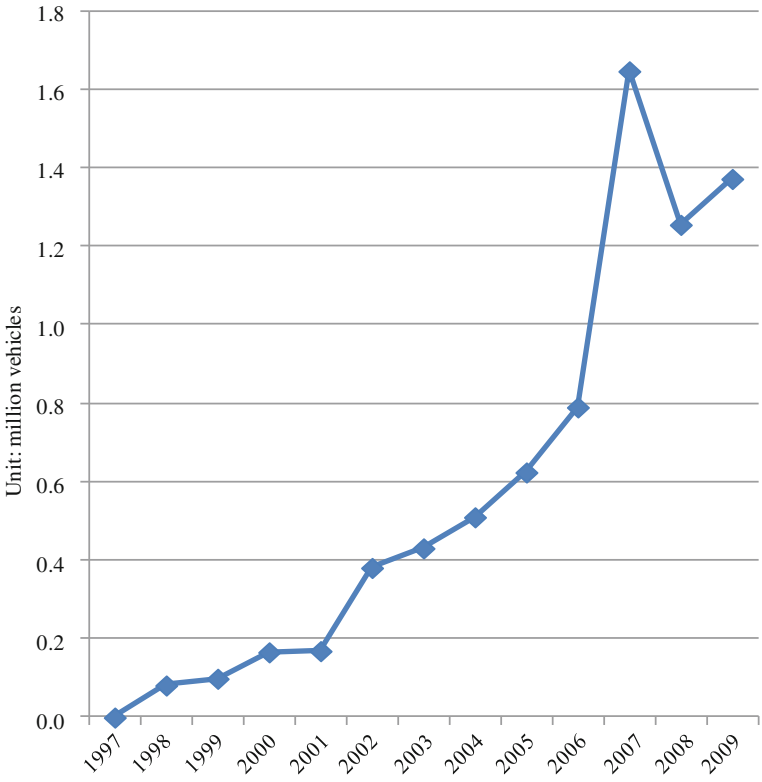

Fig. 8.1 HVN's annual motorcycle production. *Source* Fujita (2013: 32), based on Honda Motor Co., Ltd. (various years)

First, due to the small scale of its orders, the degree of purchasing power that HVN exercised over its suppliers remained limited.[1] Even though the new low-priced model had gained popularity among Vietnamese consumers, the company was constrained in the expansion of its production due to a series of restrictive policies introduced by the Vietnamese government from 2002 discussed in Chap. 2. Consequently, annual production only increased to some 400,000 units (Fig. 8.1), which was barely sufficient for suppliers to achieve minimum

[1] The size of orders takes on particular importance in industries producing products with integral product architecture. Because non-standard products often impose the additional cost of product-specific investment in physical and human resources, a lead firm will face difficulty enforcing non-standard parameters on its suppliers unless orders are large enough to make production economically viable. This is clearly illustrated by Sturgeon et al. (2008) in relation to the car industry.

economies of scale in the manufacture of those components that did not require capital-intensive production processes.[2]

Second, suppliers faced little substantive competition. The limited availability of suppliers in Vietnam with the ability to meet HVN's demanding requirements hampered its attempts to mobilise new suppliers with the aim of exposing them to intense competition. Moreover, HVN's annual production fell below the one million unit threshold that the company regarded as the minimum volume necessary for the dual sourcing of components.[3] This meant that, having once entered an HVN value chain, suppliers could expect to receive orders in the long term.

As the industry entered a new stage of development in about 2005, power relationships between HVN and its suppliers were transformed markedly. On the one hand, HVN began to wield huge purchasing power over its suppliers. This occurred as policy changes brought about a significant boost to the market as a whole as well as HVN market shares in particular. The company's annual production exceeded one million units in 2007 (Fig. 8.1), thus creating conditions conducive to the launch of dual sourcing.

On the other hand, the growing market attracted an increasing number of foreign-invested and local suppliers. This meant that HVN no longer had to spare its resources to nurture new suppliers from scratch. Table 8.1 shows the changes in HVN's local content ratios and the number of suppliers by nationality. The sharp increase in the local content ratios in the early 2000s was achieved primarily by incorporating non-Japanese suppliers such as Taiwanese, Korean and local Vietnamese suppliers. This is because Japanese firms regarded the investment environment in Vietnam to be too risky (Ichikawa 2001) and the expected scale of orders was too small.

From the year 2005 onwards, however, the rapid growth in the motorcycle market in general as well as the sales of Japanese motorcycle manufacturers in particular, combined with improvement in the overall investment environment in Vietnam,[4] triggered the entry of numerous foreign suppliers, including Japanese suppliers that had previously hesitated to invest in Vietnam. Table 8.1 shows that the subsequent increase in the local content ratios up to 2007 was achieved primarily by the incorporation of Japanese suppliers, especially those belonging to the Honda Group.

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[2] Japanese manufacturers of motorcycle components generally regarded the minimum scale needed for efficient production to be 200,000–300,000 units per year. For those components requiring capital-intensive processes, the level was much higher at one million units per year (Mishima 2007).

[3] To the extent that Japanese lead firms adopted non-standard component designs, parts could be simultaneously sourced from more than one supplier only when the size of production was sufficiently large to allow each of the suppliers to exploit economies of scale. HVN regarded this threshold to be the annual production of one million units (interviews #3, #4).

[4] A series of policy reforms in 2005 implemented in preparation for accession to the World Trade Organisation (WTO) significantly improved Vietnam's investment climate, resulting in a sudden surge of FDI from 2006 to 2008 (Tran 2009).

Table 8.1 HVN's local sourcing

	1998	2001	2004	2007
Local content ratio (%)	44	52	83	90
Total number of suppliers in Vietnam	16	20	43	58
Japanese suppliers	12	15	18	26
of which: members of Honda Group	5	6	6	11
Taiwanese and Korean suppliers	0	0	12	14
Vietnamese suppliers	4	5	13	18
of which: members of VEAM	0	0	1	3

Source Fujita (2013:33), based on interviews with HVN (#1, #2, #3). Suppliers belonging to the Honda Group and VEAM were respectively enumerated by the author on the basis of Toyo Keizai Inc. (2009) and VEAM's website (http://www.veam.com.vn/?act=thanhvien accessed 1 August 2012)

Table 8.2 The number of new models registered by year

	2001	2002	2003	2004	2005	2006	2007	2008	Total
HVN	2	1	5	6	9	17	27	35	102
Local assembler V1	28	11	4	28	105	112	191	66	545
Local assembler V2	19	15	0	10	8	8	15	0	75
Local assembler V3	10	1	5	25	43	56	112	8	260
Local assembler V4	8	6	4	8	23	16	9	9	83
Local assembler V5	19	9	4	7	8	21	15	3	86
Local assembler V6	0	1	2	5	10	12	10	1	41

Source Fujita (2013:47), based on the data obtained from the Vietnam register (http://www.vr.org.vn), accessed 6 January 2009

Having obtained a larger pool of competent suppliers that were increasingly dependent on HVN for sales, the company was ready to implement key adjustments to its sourcing practices. First, it used its weight to enforce increasingly stringent QCD targets on suppliers. The performance targets were systematically enforced and progressively adjusted each year. Underperforming suppliers were pressurised to improve their performance and, if they failed to do so, might be gradually replaced by those with better track records.

The increasingly stringent QCD targets stemmed from the shifting preferences of the Vietnamese consumers. As a result of rising levels of income and serious quality problems experienced with Chinese motorcycles in the early 2000s, urban Vietnamese consumers began to aspire to a better quality of motorcycle, while demand for low-priced imitations was limited to low-income consumers in rural areas (The Motorbike Joint Working Group 2007). In order to respond to the increasing sophistication of consumers, HVN launched a greater number of models from Stage III (Table 8.2). Many of the new models launched at this stage adopted new component technologies, higher precision levels and/or renewed external styling (interview with HVN #4). These changes were reflected in price levels:

HVN models launched between 2006 and 2008 were priced between US$932 and US$1,564—higher than the increased price of the Wave Alpha (US$807) in 2007.[5]

Second, unlike stages I and II, technical assistance was now offered selectively. Having obtained huge purchasing power and the capacity to switch suppliers, HVN reorganised its value chain in accordance with the new policy of developing closer ties with those suppliers with which Honda had direct capital relations—or what an HVN manager referred to as "group suppliers" (interview #5). In addition to Japanese suppliers that were members of the Honda Group, such favoured suppliers included Honda's joint venture partner in Vietnam, VEAM, a state-owned business group consisting of more than 20 member companies, traditionally specialising in the production of diesel engines and agricultural machinery. Among the embedded cases, suppliers A6, A8, B1 and B2 belonged to this business group. Although VEAM members did not possess complementary competencies, HVN started to attach growing priority to them as an integral part of its extended corporate group (interview #5). Apart from direct capital ties, high levels of manufacturing competence relative to other local suppliers, a sense of trust that had been built through long-term relations as a joint venture partner, and executives with a good understanding of Japanese management practices and willingness to expand business with Japanese companies also account for HVN's preference for outsourcing key components to VEAM members (interview with HVN #5).

As a result, HVN shifted to "a focused approach in offering direct technical assistance to suppliers" (interview with HVN #4). Instead of assisting a wide range of local firms with the aim of increasing the local content ratio, as HVN had done in the early 2000s, assistance was now offered only to strategically selected suppliers implementing key localisation projects, and VEAM members became the targets of such projects. A6 was one of the first VEAM members selected by HVN as first-tier suppliers in the early 2000s. With the new priority, A8 and B1 were added as first-tier suppliers in 2004–05. Finally, after four years of preparation, by early 2009, HVN agreed in principle to source metal stamped components from B2 (interview with B2 #1).

8.1.2 Emergent Model 1: Learning Driven by Supplier Initiative

The aforementioned adjustments to HVN's sourcing practices brought about a modification to the original Japanese learning model discussed in Sect 7.2. The present sub-section focuses on an emerging variant of the Japanese learning model, which is characterised by the growing importance of suppliers' independent, innovative initiatives in the face of diminished direct knowledge transfer on

[5] Prices quoted in various issues of *Oto-Xe May* (*Automobiles and Motorcycles*).

the part of the lead firm. The analysis is based on an in-depth comparative examination of two sets of suppliers: two suppliers of plastic components (A1 and A4), and two suppliers of various metal components (A2 and A3). These firms were selected because suppliers belonging to each set started to exhibit contrasting learning trajectories by Stage III in spite of similar development up to Stage II.

The analysis of the learning events experienced by these suppliers up to the early 2000s (Events #1 and #2 at A2; Events #1 and #2 at A3; Events #1 and #2 at A1; Event #1 at A4) supports the original Japanese model. Suppliers A1, A3, and A4 emphasised how frequent hands-on advice offered by Honda's experts helped them to overcome initial difficulties. Supplier A2 was less enthusiastic about discussing the role of lead firm assistance, but its general director acknowledged that HVN's support helped them to overcome problems that they had experienced (interview #1). While it was mainly left to the suppliers to ensure that they reached the required standards, activities in mobilising knowledge sources were largely similar across firms, and there were few original attempts that went much further than following HVN instructions.

Learning events that took place in these four suppliers during Stage III suggest the continual modification of the Japanese model. First, a combination of *inducement* and *monitoring* began to exert greater pressure on them. Product specifications grew increasingly demanding as HVN launched new models consisting of more complex and high-precision components; annual QCD targets were set more clearly and raised each year; and performance was monitored systematically via monthly, quarterly and annual compilation of defect ratios, frequency of delayed deliveries, and cost reduction records.

Supplier A1 noted that it faced its biggest challenge in terms of production management around 2004–2005. Deliveries increased from once a day in the early years to between five and seven times a day, quality targets were specified as defect ratios in parts per million, and incremental cost reduction was requested every year. Faced with these challenges, the supplier realised that there was a need to fundamentally change its quality management system (Event #3). Likewise, supplier A2 pointed out that it was between 2005 and 2008 that the company transformed its equipment-related activities most extensively. Increasing orders for complex components[6] and challenging annual cost reduction targets imposed by HVN became the impetus for supplier A2 to acquire the ability to continuously improve process designs, thereby generating the capacity to manufacture increasingly complex components (Event #3).

Second, *direct knowledge transfer* initiated by the lead firm began to play a more minor role, suggesting that its relative importance had diminished. In all of the events experienced by the four suppliers under study in Stage III, the lead firm roles in addition to specifications and monitoring were largely limited to checking

[6] In the late 1990s, A2 produced 15 or 16 types of simple components requiring little processing; however, by 2008, it was producing more than 300 types of components, including some that had to undergo 25 distinct processes (interview #2).

and approving the process design and factory layout, and the troubleshooting of problems that could not be solved by the suppliers themselves.

Lastly and most importantly, suppliers' *internal learning activities* became much more diverse and sophisticated, emerging as a key factor in determining supplier learning trajectories. In high-performing suppliers, capability building activities combined both long-term, persistent attempts at internal resource accumulation and more independent, innovative initiatives, often going much further than requirements, advice or instructions provided by HVN. This is illustrated by Event #2 at supplier A1. This supplier's attempts at developing and instituting a company-wide production management system were based on its independent initiative rather than requests made from the lead firms with which it worked.[7] The initiative was launched by the general director in 2005 with the aim of integrating the individual management techniques and schemes that had previously been introduced at in the company into an integrated quality control system (interview with A1 #3).

Through organising study groups and discussions within and across departments, supplier A1 substantially improved coordination and communication between different sections of the firm, nurtured problem-solving capacity and quality awareness, and implemented continuous improvement in activities at all levels and successfully obtained ISO9001 certification in 2006 (interviews with A1 #3, #4). By 2008, this supplier was receiving increasing volumes of HVN's orders for relatively complex plastic components as well as plastic moulds requiring relatively high levels of precision (interview with A1 #4). This is in sharp contrast to A4, which, as we shall see, lagged far behind the other in terms of capability building.

A combination of internal resource accumulation and enhanced independent learning initiatives can also be observed in respect of Event #3 at supplier A2.[8] This supplier acquired the ability to design production processes for complex components and implement continuous improvement in such processes. To this end, supplier A2 not only invested in human resources, that is, the training of engineers, and physical equipment such as hot and cold forging equipment, and computer numerically controlled (CNC) machining stations, as other local suppliers in Japanese chains had done, but also implemented a number of systematic organisational improvements that facilitated in-house engineering efforts.

First, supplier A2 developed and implemented a system of regular and close communication between its process design departments and production sites. This enabled it to continuously improve manufacturing processes that reflected the

[7] HVN was A1's largest, although not sole, major customer. The firm served buyers in other sectors such as consumer electronics and telecommunications but, most notably, it only traded with foreign buyers that had similar requirements (interview with A1 #2, #4). Equipment-related and production management capabilities that the supplier acquired via its relation with HVN could therefore be applied to the service of other customers as well.

[8] Unless otherwise mentioned, the discussion of this event is based on the interview with supplier A2 #2.

actual requirements of production sites. Second, reports on experiences in the design and improvement of production processes were systematically compiled and shared across different departments via internal workshops. The accumulated records of past experimentation and design changes became a key resource to which process design engineers could refer when either initiating new products or improving existing ones.

Through these changes, supplier A2 not only won HVN orders for high-precision components requiring complex production processes but also improved its productivity performance.

On the other hand, the learning performances of suppliers A3 and A4 fell short of those achieved by suppliers A2 and A1, primarily due to the lack of one or both of the key elements of supplier learning progress: long-term, persistent attempts at internal resource accumulation, and independent, innovative initiative. Supplier A4 lacked both. The sources of learning in its Event #2 demonstrate the limited emphasis the supplier placed on the persistent accumulation of internal resources—not to mention independent innovative initiatives.

Supplier A4 acquired mould design and manufacturing capability via the quick route of investment in new machinery and equipment, and through the recruitment of several new employees, including engineers and operators, who had worked for a Japanese joint venture company that produced plastic moulds (interview #2). However, supplier A4 engaged in limited internal training and organisational changes aimed at improving its equipment-related or production management activities (ibid.).

As a result, its mould design and manufacturing capability fell behind that of supplier A1. Unlike supplier A1, which was allowed by HVN to supply plastic moulds not only for its own use but also for HVN's other suppliers (see Sect. 6.3.1), A4 was only permitted to manufacture moulds for its own use in the production of relatively simple components. Moreover, production management techniques taught by the former employees of the Japanese joint venture company had not contributed to significantly improving the level of the supplier's production management capability. In addition, persistent problems, such as damage to components in transit due to improper loading and careless driving (ibid.), reveal fundamental weaknesses in management and a lack of awareness of quality standards.

The second case of shortcoming, supplier A3, had made steady progress in internal resource accumulation in response to the lead firm requirements but had failed to engage in more independent and innovative activities. This explains why the supplier reached the assimilative level but failed to progress further, unlike A2. In terms of physical investment in new machinery and production lines, A3 was on a par with A2. However the main differences between the two suppliers lay in their respective degrees of independent innovative effort. Although A3 endeavoured to adhere to HVN's requirements and instructions, it engaged in limited in-house R&D in equipment-related or production management activities. In the end, the supplier ended up failing to make progress beyond the assimilative for its equipment-related and production management capabilities, and HVN's orders to this supplier continued to focus on relatively simple components.

8.1.3 Emergent Model 2: Learning Assisted by Extensive Lead Firm Intervention

Concurrent with the aforementioned modification, a totally different type of adjustment was underway that gave rise to another variant of the Japanese learning model. Under this variant, the lead firm continued to intervene extensively in suppliers' activities with the aim of localising the production of high-precision engine components. Whereas the former type of adjustment discussed in Sect. 8.1.2 was observed for the majority of HVN's first-tier suppliers, the current type of adjustment was limited to two VEAM member company initiatives: supplier A6's initiation of forging processes for connecting rods (Event #2), and supplier A8's commencement of forging processes for crankshafts (Event #3).[9] Although these events were quite exceptional, they deserve in-depth analysis because of their importance to Vietnamese industrial development.

These two events were the first incidences in which local Vietnamese companies acquired the sophisticated capabilities necessary for manufacturing high-precision automotive engine components. When HVN sought to localise the production of these parts around 2005,[10] the company designated the two VEAM member companies to undertake initial processing, as they were the only local companies equipped with the requisite hot forging technology (interview with HVN #4), but as we shall see their membership in VEAM was also a critical factor behind HVN's decision to engage them. The final processing of the connecting rods and crankshafts was to be undertaken by Japanese supplier X and HVN, respectively.

The most notable feature of these two learning events is that the necessary levels of precision far exceeded the existing capabilities of either supplier. However, it is worth emphasising the differences between the two suppliers in terms of the degree of such divergence. Even though the two suppliers had the relevant technology, HVN was apparently more enthusiastic about outsourcing high-precision processing to A6 than A8. Indeed, HVN's procurement manager admitted that A6 had a more advanced level of technology at this stage (interview with HVN #4). Having supplied sprockets to the lead firm since 2001, supplier A6 had made progress in improving equipment-related and production management capabilities (Event #1).

Conversely, supplier A8 had not previously served HVN or any other international buyer as a direct customer; its experience in Japanese chains had been confined to limited subcontracting work provided by A6 (Event #1). HVN made the decision to outsource the high-precision processing of crankshafts to A8 "taking into consideration the interests of the joint venture partner, VEAM"

[9] It was confirmed with HVN that these were the only suppliers with which the lead firm trialled its new approach to component localisation (interview with HVN #5).

[10] Since production processes for these components required substantial investment, localisation of manufacture made economic sense only when the scale of HVN's production reached approximately one million units per year (interview with Japanese supplier X #1).

(interview with HVN #4). Faced with large gaps in A8's technological capability, HVN proposed that the supplier set up a joint venture with a Japanese firm to be designated by the former. However, this proposal was rejected by A8, which opted to acquire the requisite technology independently (ibid.).

Due to the large gap in the capability levels of both A6 and A8, and the level required by HVN, the emergent learning model variant was characterised by active and far-reaching intervention by the lead firm. HVN insisted that the two suppliers sign technological assistance agreements with Japanese companies designated by Honda (ibid.). Apart from *inducement* and *monitoring* by the direct customer, *direct knowledge transfer* was to be provided by these Japanese companies as a condition of the agreement in return for payment by the suppliers. Nevertheless, the way in which the emerging variant actually worked and the level of mastery varied between A6 and A8.

In the case of A8, the designated partner was a Japanese company with expertise in high-precision forging technology, designing and manufacturing dies, and the development of forging equipment and production systems. This company provided A8 with a comprehensive package of assistance including (1) drawings, dies, process designs, working standards, and quality control schemes, (2) specifications for the equipment to be installed, (3) an intensive training programme for A8's engineers and operators, including a three-month course for 15 engineers at the company's headquarters in Japan and (4) a full-time Japanese supervisor posted at A8's factory to monitor and supervise the daily operation of the new production lines (interview with A8 #1).

The last element of the package deserves particular attention. A8's daily operations had been constantly monitored by the full-time Japanese supervisor from the outset; as of March 2009—nearly five years after the initial launch of the project—the Japanese expert was still stationed full time on site (interview with HVN #5).

The case of supplier A6 involved more complex transactional relations and knowledge flows, as shown in Fig. 8.2. In addition to A6 itself, three other actors were involved: Japanese supplier X (a direct customer of A6 and a first-tier supplier based in Vietnam that undertook final processing of components to be delivered to HVN), a Japanese supplier Y in Thailand (a Japanese affiliate based in Thailand that supplied connecting rods to Honda Thailand and entered into a technological assistance agreement with A6), and Vietnamese supplier Z (a manufacturer that supplied forging dies to A6).

Under the technological assistance agreement between Y and A6, experts from the former visited A6 and Z every three months to conduct regular checks and offer advice. Given the limited frequency of supplier Y's visits, supplier X monitored A8's routine operations, acting as a mediator as necessary. Accordingly, supplier X reported problems in A6's operations via emails to supplier Y with photographic and video attachments, and supervised A6 on the basis of recommendations received in reply. In other words, supplier X took direct responsibility for A6's performance in relation to HVN, providing A6 with hands-on support in the absence of any formalised agreement or payment.

Under this arrangement, A6 was subject to far-reaching and active intervention from both suppliers X and Y. During the initial years of operation, supplier X

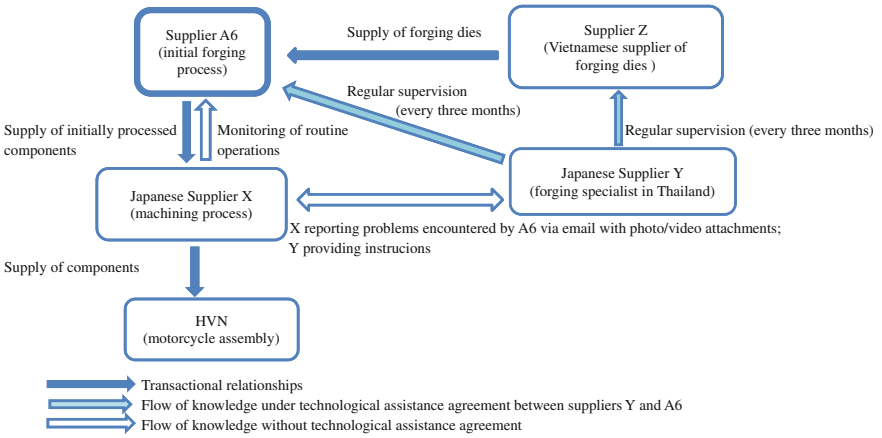

Fig. 8.2 Transactional relationships and knowledge flows comprising supplier A6's learning Event #2. *Source* Prepared by the author, based on interviews with supplier A6 #2, #3; Japanese supplier X #1; and HVN #4, #5

required A6 to provide situation reports on a daily basis (interview with X #1). Suppliers X and Y organised numerous training sessions on forging technology, such as maintenance of dies and temperature control, in the form of both classroom sessions and the on-site training of engineers (ibid.). However, unlike the case of A8, lead firm intervention did not go as far as full-time supervision in overseeing the daily operation of production lines over an extended period. Moreover, the degree of assistance and supervision gradually diminished over time (ibid.).

In both cases, intervention by companies designated by the lead firm meant limited space for the suppliers to manoeuvre, and they were basically expected to process components in exact accordance with instructions. However, *supplier learning activities* still mattered. This was particularly the case with A6. Since the early 2000s, A6 had consistently engaged in internal training to upgrade levels of processing, maintenance of dies, and production management (interviews with A6 #1, #2). By 2008, the frequency and intensity of assistance from suppliers X and Y had diminished, and the company was able to operate the forging process for the production of high-precision components largely on its own (interview with X #1), a task that required thorough and sophisticated technical knowledge that very few if any Vietnamese firms had managed to achieve.

With reduced assistance, A6 was able to reach HVN's product quality requirements largely on its own by the end of 2009. As a result, the precision dimension of its equipment-related capability reached the assimilative level, which could be assessed as an important observable learning outcome. However, even though A6 managed to reach the quality requirements by 2010, this had still been achieved at the expense of low productivity resulting from high internal defect ratios and a lengthy manufacturing cycle (interview with X #1). This suggests that production management still had room for improvement.

In the case of A8, the space for independent initiative was more limited. Apart from recruiting new engineers and operators, almost everything needed for production was either provided or specified by the Japanese partner. Moreover, five years after the production line had started operating, the vital role of the Japanese supervisor had not diminished (interview with HVN #4, #5). Acknowledging that A8 occasionally made arbitrary and ill-informed adjustments to equipment or production processes, HVN's procurement manager stressed that the supplier's performance could not be sustained without external supervision (interview #5).

This suggests that A8's track record in sustaining the stable operation of its first forging line and in reaching HVN's quality requirements cannot be entirely attributed to capabilities specific to the supplier. As of 2008, the learning event was still on-going. Even though A8 continued to aim towards building assimilative levels of equipment-related and production management capabilities, its inability to maintain stable and continuous operation suggests that its capabilities remained at the operational level.

8.2 Supplier-Initiated Transformation of the Vietnamese–Chinese Model

Unlike the lead firm-driven adjustments to the Japanese learning model discussed above, the impetus for the transformation of the Vietnamese–Chinese model came primarily from the suppliers. The key feature of this variant was the emergence of a two-way knowledge flow between the lead firm and its suppliers. Although the intensity of such a knowledge flow cannot be compared to that observed in the Japanese chains, it still signified an important departure from the arm's-length market transactions that had prevailed during stages I and II. This sub-section investigates the transformation of this learning model via an in-depth comparative analysis of suppliers B4 and C1, suppliers of metal stamped components in Vietnamese–Chinese chains that had begun to exhibit contrasting learning trajectories by Stage III.

The lack of lead firm initiative in transforming relations with suppliers is confirmed by the findings of research on local assemblers. By this stage, the local assembly sector was dominated by a small number of large firms focusing on the production of low-priced imitations of Japanese models for the rural market that even HVN's low-priced model had not penetrated. The in-depth analyses of some of the largest assemblers in Stage III found that they continued to define product specifications only vaguely and engaged in limited monitoring of supplier performance (Fujita 2013).

The absence of a lead firm-initiated impetus for changing arm's-length relations was corroborated by suppliers B4 and C1. First, neither of them had main customers that placed regular orders over the long term. As of the time of the interview in 2008, supplier B4 had transactions with more than 20 local assemblers, its general director commenting:

> For us, all customers are equally important…all of them are our main customers. For instance, a company placed large orders with us in September this year but it is quite possible that next year, this company will not be able to sell [its products] and thus will no longer place orders with us.
>
> (interview with B4 #1)

Second, there were no instances of lead firm *direct knowledge transfer* playing a key role in supplier learning in Stage III (Table 7.2). Third, in terms of *inducement* and *monitoring*, the ways in which lead firms communicated product specifications and monitored supplier performance had not changed substantially. Neither B4 nor C1 was explicitly informed by their customers of the specifications required. They both pointed out there were increased instances of customers returning defective components and asking for replacements after 2005; however, in the absence of clearly specified product standards or requirements, supplier B4 suspected that inspection was conducted arbitrarily:

> They only inspect externally by sight. If they look at a component and happen to notice any visible defect, they ask for a replacement. They don't have testing equipment—they don't invest in it—and they don't have engineers specialised in testing components.
>
> (interview with B4 #2 on Event #1)

Given such limited lead firm engagement, any impetus for change came from the supplier. This is illustrated by supplier B4's first learning event, which extended from Stage II to Stage III. Through this event, the supplier acquired the ability to make its own minor cosmetic and functional modifications to the design of silencers. A notable feature of this event was that the mobilisation of internal knowledge sources occurred in the context of the supplier's attempts to actively engage with the lead firm and generate a two-way knowledge flow.

By 2002, supplier B4 had recognised the *potential* demand of its customers for component design modifications (interview #1). Since "local assemblers did not have design drawings or know anything about technical parameters" (ibid.), the supplier took the initiative to launch a new silencer design. The supplier established an R&D department; invested in software, and design, testing and measuring equipment; and trained design engineers. The R&D department initially only had three engineers but this number had increased to 24 or 25 by 2006 (ibid.).

In the process of product design and prototyping, the R&D department worked closely with the marketing department which made systematic attempts to survey customer preferences by engaging in regular communication with local assemblers, motorcycle dealers and final consumers (interview with B4 #1, #2). Supplier B4's attempts at engaging with its customers resulted in the following two-way knowledge flow: (1) lead firms transferred information on market demand to B4, (2) by pooling and analysing the market information gathered from various actors, B4 developed component prototypes and (3) lead firms provided feedback on the prototypes (ibid.).

Here it should be emphasised that, unlike suppliers in Japanese chains, supplier B4 deliberately engaged with *many* lead firms rather than one specific company, and developed product designs aimed to meet the requirements of such lead firms

in general rather than the discrete requirements of any one of them (interview #1). Even when the lack of component compatibility arising from the limits of de facto standardisation called for adjustments in the interface with other components, supplier B4 systematically arranged for the requisite modifications upon the start of the transactions with its customers (interview #2)—quite unlike ad hoc and ex post adjustments observed earlier in Vietnamese–Chinese chains. Thus, under volatile market conditions, B4 was able to save on product development costs and avoid the risk of becoming dependent on a particular lead firm.

By 2005–2006, supplier B4 was able to launch three to four new component designs per year under the company's own brand name, which were sold to more than 30 local assemblers (interview #1). In 2008, it even launched an innovative silencer design that complied with a new government policy which required the meeting of Euro 2 emission standards (ibid.). It was a combination of investment in physical and human resources together with the strategic pooling and use of knowledge flows with many lead firms that enabled the supplier to acquire the adaptive level of new product introduction capability. Due to such enhanced capability, the supplier was able to expand its sales to a large number of customers while most other suppliers in Vietnamese–Chinese chains were facing diminishing sales.

Conversely, supplier C1 failed to achieve substantial improvement in the basic reverse engineering capability it had acquired during the early years of its entry into Vietnamese–Chinese chains (Event #1). The supplier was one of the first local companies to produce motorcycle components for local assemblers, serving around 50 customers in the late 1990s (interview #1). However, the absence of capability building in subsequent years can be attributed to the limited investment it made in physical and human resources. Of the machinery and equipment the supplier used, only 30 % constituted new investment, while 70 % was accounted for by antiquated machines it had used for manufacturing bicycle components—its traditional product (ibid.). Even the supplier's new equipment consisted largely of second-hand apparatus that did not include design or high-precision processing machines (ibid.).

Supplier C1 also made limited effort to accumulate human resources, as the general director himself took charge of most skill-intensive activities such as the replication of drawings, prototype production, design of production processes, and testing (ibid.). As the entry of new suppliers into the sector meant that competition between them grew more intense, supplier C1 suffered from a serious decline in sales. In 2006, it decided to cease the manufacture of motorcycle components for local assemblers and switch to other products—although as of 2008, its endeavours in exploring new markets had met with limited success.[11]

[11] From 2003, supplier C1 began to supply motorcycle components to VMEP but its sales volume failed to grow. As of 2008, the supplier was being approached by a German company seeking to outsource the manufacture of forklifts to a Vietnamese firm, but no contract had yet been signed (interview #1).

8.3 Discussion

In an attempt to answer the question of why supplier learning trajectories evolved over time, this chapter examined adjustments that took place in the two original learning models during Stage III. In so doing, it sought to explain why some suppliers in Japanese and Vietnamese–Chinese chains respectively reached the adaptive level of one or more functional types of capability while others lagged behind.

While the actor constellations of the original models outlined in Chap. 7 were broadly maintained in Stage III, variations were observed in the nature and intensity of actor involvement in supplier learning as well as knowledge flows between the actors. Figure 8.3 depicts the emerging variants of the two learning models. Two distinct types of adjustment were observed in the Japanese model and one in the Vietnamese–Chinese model.

In the first Japanese variant (Fig. 8.3a), direct knowledge transfer initiated by the lead firm is diminished. The lead firm continued to play an important role via inducement and monitoring to impose increasingly challenging performance targets on suppliers, but supplier learning outcomes grew to depend increasingly on their own independent and innovative initiatives. Under this model, the independent learning initiatives of high-performing suppliers often extended beyond lead firm requirements or instructions. Such activities enabled these suppliers to reach the basic innovative level of equipment-related and/or production management capability and even influence HVN's allocation of orders for highly sophisticated components or processes.

Conversely, the second Japanese variant (Fig. 8.3b) involved a thicker one-way knowledge flow from lead firm to suppliers than in the previous stages. Interventions from companies directly designated by the lead firm intensified in magnitude and content, eventually being consolidated as formalised agreements in return for payment by the suppliers. These interventions continued to cover all three domains of lead firm involvement: inducement, direct and indirect knowledge transfer, and monitoring. Due to the large capability gaps that had to be filled, even routine operation of the production processes by suppliers required frequent and extensive monitoring and assistance from the companies designated by the lead firm, leaving little room for the former to manoeuvre. However, the comparative case study of A6 and A8 showed that suppliers' internal mobilisation of resources still influenced learning outcomes.

Figure 8.3c depicts the emerging variant of the Vietnamese–Chinese learning model. While capability building continued to be largely a result of suppliers' independent learning initiatives, one case study supplier, B4, took the lead in initiating a two-way knowledge flow with its customers in the course of its first learning event. Assemblers provided supplier B4 with key inputs for product design, i.e., market information, while the supplier responded to lead firm requirements by initiating several prototypes reflecting the customer requirements. While the intensity of knowledge flow in this variant cannot be compared to that in

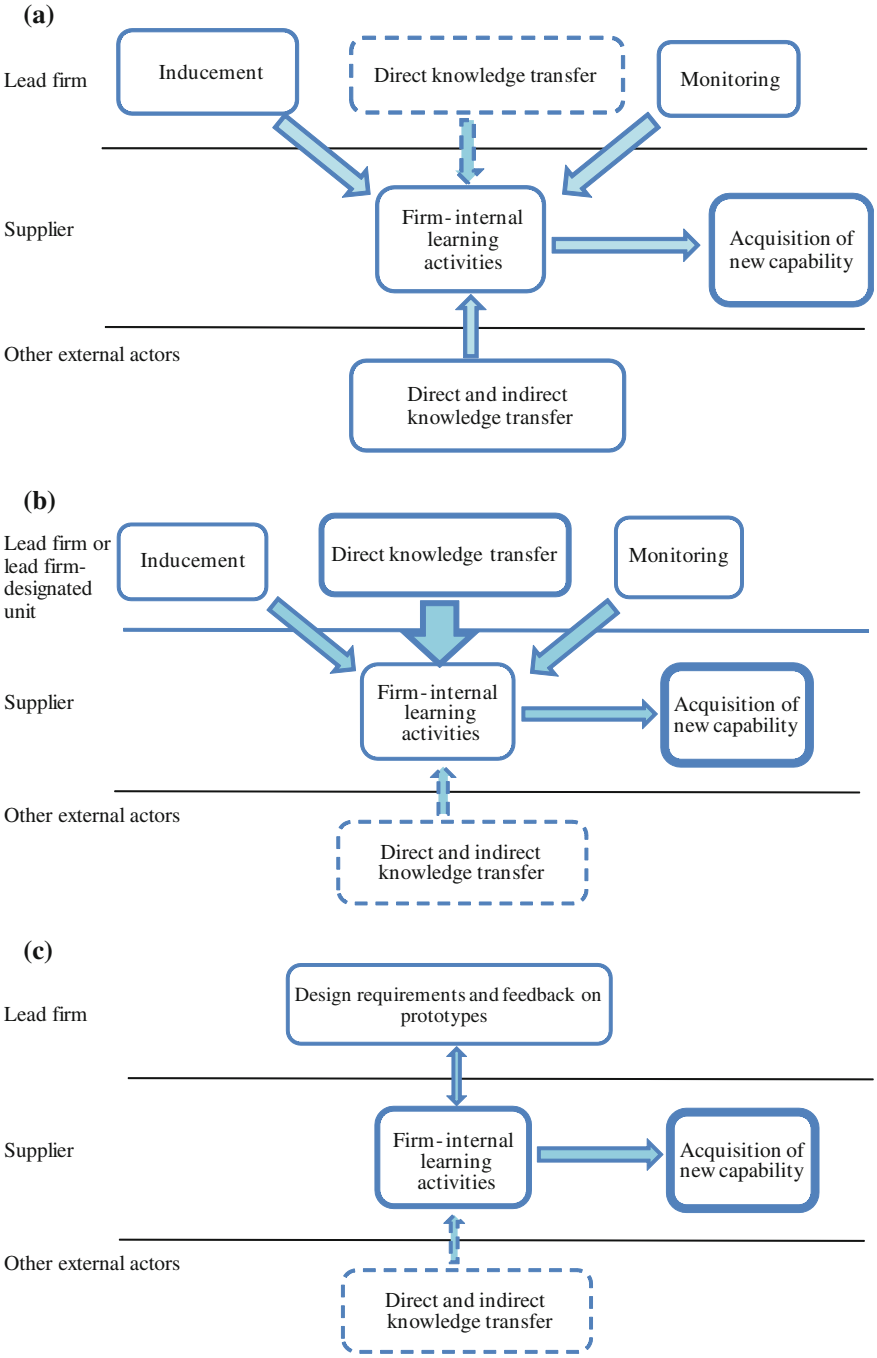

Fig. 8.3 Adjustments to learning models (Stage III). (**a**) Japanese learning model variant 1. (**b**) Japanese learning model variant 2. (**c**) Vietnamese–Chinese learning model variant. *Source* Prepared by the author

Japanese chains, together with several other suppliers—which were mostly Chinese, B4 formed a "shared supply base" (Sturgeon and Lee 2005) from which to service local assemblers in general.[12]

Not only did the formation of advanced capabilities enable B4 and other suppliers[13] to expand their sales to a wide range of customers, but the emergence of a shared supply base also led local assemblers to adjust their sourcing practices. Instead of engaging in frequent switching of suppliers in search for those offering low prices, as was the case in Stage II, local assemblers by Stage III came to capitalise on these competent suppliers to realise reasonable quality, high product variety incorporating diverse cosmetic modifications to several critical components, and low costs facilitated by large manufacturing economies of scale (Fujita 2011, 2013).

It should be noted that *engaging with multiple lead firms* in the present context must be distinguished from what Navas-Alemán (2011: 1386) refers to as "operating in multiple value chains". This is because the focus of the latter is on the effects of engagement with several value chains *with different types of chain governance* influencing supplier capability building, whilst supplier B4's relations with local assemblers were characterised by a *single* pattern of transactional governance. Nevertheless, given that value chains with contrasting governance patterns, i.e., Japanese and Vietnamese-Chinese chains, do coexist in this industry, it is worth asking whether local suppliers have prospects for adopting a "multichain strategy" (Navas-Alemán 2011: 1395) to achieve successful learning outcomes.

However, the available evidence seems to provide little support for this scenario. Indeed, a "multichain strategy" has not been a realistic option for local suppliers operating in this industry. None of the case suppliers operated *simultaneously* at the first tier of Japanese and Vietnamese–Chinese chains. Two Group B suppliers that eventually became HVN's first-tier suppliers (B1 and B2) had operated in Vietnamese–Chinese chains for extremely short periods. Even though supplier B4 did operate simultaneously in Vietnamese–Chinese chains and at the second tier of Japanese chains, it had not succeeded in its attempts to be qualified by HVN as a first-tier supplier (interview with B4 #2). This is plausible, given HVN's hesitation to outsource components—which entails provision of proprietary design drawings—to companies whose management is oriented towards manufacturing of components that imitate Japanese designs (interview #5).

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[12] This organisational pattern would seem to resemble that observed in industries where standards of compatibility give rise to modular networks (Sturgeon and Lee 2005), although the partiality of component standardisation in the Vietnamese motorcycle assembly sector means that emerging organisational patterns should be distinguished from modular networks.

[13] Fujita (2011, 2013) discusses a case of Chinese supplier which, similar to the case of supplier B4, successfully expanded sales to a large number of local assemblers by acquiring the capability to conduct minor cosmetic and functional modifications to the designs of several key components and realising low-cost manufacturing by investing in large-scale production capacity.

As a result of on-going adjustment, the two learning models came to be characterised by increasingly complex flows of knowledge between lead firms and suppliers. This is quite unlike the original learning models, in which capability building could be explained primarily (although not exclusively) in terms of the leading roles played by *either* of the two key actors: the Japanese model, in which learning was critically shaped by a one-way knowledge flow from lead firm to suppliers, and the Vietnamese–Chinese model, in which learning resulted from suppliers' independent learning activities. In the first variant of the Japanese model and the adjusted Vietnamese–Chinese model in particular, supplier learning was driven by a combination of critical roles played by both lead firms and suppliers.

The present analysis therefore corroborates the argument that in analysing the sources of learning, it is essential to give a balanced focus to the roles played by *both* the lead firm *and* its suppliers rather than merely emphasising the unilateral actions of either party.

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Chapter 9
Conclusion

Abstract Drawing on historical evidence and recent empirical data on the Vietnamese motorcycle industry collected through repeated rounds of in-depth fieldwork, this book has shown that (1) suppliers learning trajectories in this industry evolved over time, resulting in a divergence in learning performance across suppliers in later stages of industrial development and (2) the diverging performance can be explained by the combination of roles played by lead firms in inducing and facilitating supplier learning and the roles of suppliers in mobilising their own sources of knowledge. These findings not only provide highly dynamic and insightful accounts of supplier learning in a developing country context but also make key theoretical and methodological contributions to the research on value chain participation and supplier learning.

Keywords Supplier · Capability building trajectory · Capability building mechanism · Power of longitudinal research · Mutual influence by lead firms and suppliers

One of the major challenges for developing countries seeking to develop their own competitive industries is amassing a substantial pool of component suppliers equipped with sophisticated capabilities. This book attempted to look into the processes and mechanisms by which developing country firms starting at a low level on the technological ladder accumulate key capabilities over an extended period of time. Through an in-depth examination of the transformation of the Vietnamese motorcycle industry over the period of a decade, this book specifically examined the following two research questions.

Question 1: *How did local suppliers' capability building evolve from the late 1990s?*

Question 2: *What actor constellations and what knowledge flows led to critical learning events?*

This concluding chapter starts by summarising the findings of the empirical analysis of the Vietnamese motorcycle industry corresponding to the two research questions. Then, it discusses the wider implications of the empirical findings—for

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general understanding of firm-level capability building in developing country suppliers and for the methodology to conduct research on capability building processes and mechanisms. This is followed by a brief discussion of the transformation of the Vietnamese motorcycle industry after 2009 and its implications for the findings of this book. The chapter ends by discussing the limitations of the analysis and suggesting the areas where further research is needed.

9.1 Empirical Findings of the Book

With regard to the first research question, the empirical analysis revealed the evolving capability building trajectories of local suppliers over time. Prior to entering the motorcycle value chain, the majority of the suppliers possessed very rudimentary levels of new product introduction and/or production capability that were barely sufficient to supply simple products such as household metal or plastic products, components for bicycles or agricultural machinery, or replacement components for domestic consumers. The only exceptions were a number of suppliers set up by managers and engineers after accumulating skills and experience via working in foreign-invested companies.

Towards the end of the period under investigation, suppliers had accumulated much more advanced levels of capability, although divergence was observed in learning performance even across suppliers participating in the same value chain, not to mention suppliers participating in different types of value chains. High-performing suppliers had even made significant headway in acquiring basic innovative levels of new product introduction or production capabilities—such as the capability to process high-precision engine components to the requirements of a major global motorcycle manufacturer, the capability to implement continuous improvement to production processes for meeting increasingly demanding quality and delivery requirements, and the capability to make minor functional or cosmetic modifications to the existing component designs in accordance with the consumers' needs. These suppliers are likely to become the bedrock not only for Vietnam's motorcycle industry but more generally for the country's mechanical engineering industry, as the types of capabilities acquired by these suppliers can be applied to activities in a wider variety of industries.

Findings with regard to functional types of capabilities were largely in line with the existing literature, but the systematic application of the classification of capabilities has made it possible for this research to provide important additional insights. Consistent with the literature, the types of capabilities acquired by the suppliers were loosely associated with the types of value chains in which the suppliers participated. That is, learning in Japanese chains concentrated overwhelmingly on production-related capabilities, whilst learning in Vietnamese–Chinese chains was observed in both new product introduction and production-related capabilities. However, our empirical analysis found variations among suppliers in Japanese chains with regard to the domains of emphasis, i.e., either

equipment-related activities and/or production management. Likewise, variations were observed among suppliers in Vietnamese–Chinese chains as well. Whilst most suppliers failed to invest in learning beyond routine activities in any of the functional categories, a few suppliers explicitly focused on the acquisition of new product introduction capabilities.

Most importantly, regardless of the type of motorcycle production value chain in which suppliers participated, the biggest leaps in capability level experienced by case suppliers were overwhelmingly concentrated in Stage III of industrial development. Although the China shock did bring about stimulus effects to firms in Japanese and Vietnamese–Chinese chains, the in-depth analyses presented in this book suggest its effects on suppliers' capability building turned out to be relatively modest. Despite largely neglected in the existing analyses of the Vietnamese motorcycle industry, Stage III was the most dynamic period in the history of the industry as lead firms and suppliers were released from the arbitrary and unstable policy environment that had prevailed in the previous period. It was only in Stage III that high performers in Japanese and Vietnamese–Chinese chains started to acquire basic innovative levels of capability in production and new product introduction activities, respectively. The findings also identified low-performing and/or intermediate groups in both Japanese and Vietnamese–Chinese chains, thus suggesting a growing divergence in learning performance across suppliers.

These findings, however, need to be interpreted with caution. As the cases were selected strategically rather than randomly, the results clearly show the heterogeneity of learning paths across suppliers but do not reveal anything about how prevalent each of the emerging patterns was. Considering that local suppliers have come to face high barriers to entry and intense competition in both Japanese and Vietnamese–Chinese chains by the latest stage of industrial development, the cases of high performers analysed in detail in Chap. 8 are likely to be generalisable only to a narrow group of suppliers operating in the Vietnamese motorcycle industry. Nevertheless, considering the advanced capabilities these suppliers acquired, they are likely to be among the core companies driving the development of the local mechanical component industry in Vietnam.

Albeit subject to limitations, the above findings do make an important contribution to the research on firm-level capability building in empirically showing that capability building among suppliers at the lower end of the technological trajectory was an evolutionary process involving major leaps, slow progress, and/or even halted learning at different points in time.

With regard to the second research question which is concerned with the sources of supplier learning, the literature emphasises constellations that focus on *either* of the two main actors: the lead firm as the key actor structuring learning opportunities within value chains, or suppliers as the very agent of capability building. This book took the analysis of actor constellations as its starting point but then went further to examine the specific knowledge sources that contributed to key learning events.

This book elaborated on the mechanisms of supplier learning as two distinct learning models, i.e., the Japanese model characterised by thick one-way flow of

knowledge from the lead firm to its suppliers, and the Vietnamese–Chinese model based primarily on the suppliers' own initiative in the mobilisation of internal sources of knowledge with limited knowledge flows between the lead firm and its suppliers. The contrasting learning models stemmed out of the distinct strategies pursued by the respective lead firms and suppliers.

Moreover, the analysis went further in exploring the evolution of the two learning models. It demonstrated that the roles played by lead firms and suppliers in Japanese and Vietnamese–Chinese chains changed over time, and that such changes were indeed critical in explaining the trajectories of supplier learning over the three stages of industrial development. The Japanese learning model initially combined active lead firm intervention and suppliers' mobilisation of internal resources in accordance with the guidance of the former. However, over time, this model was transformed into two distinct variants—one providing greater scope for suppliers' innovative initiatives in internal resource mobilisation to influence learning outcomes, and the other characterised by even more powerful intervention and guidance on the part of the lead firm. On the other hand, the Vietnamese–Chinese model was initially based on suppliers' independent learning but eventually came to be characterised by a two-way knowledge flow driven by attempts by suppliers to actively engage with a large number of customers.

In summary, these empirical findings point to a much more dynamic picture of and provide greater insight into local supplier learning in the Vietnamese motorcycle industry than that illustrated by previous empirical research that relied on static analyses of a very small number of cases. In the recent dynamic Stage III of Vietnamese industrial development, supplier learning not only progressed to significantly advanced levels but was also driven by mechanisms that were qualitatively different from those in the previous two stages.

9.2 Implications for Research on Capability Building among Developing Country Suppliers

The empirical findings summarised above are significant in their own right. However, the results also make contributions of much more general relevance, specifically to the understanding of the trajectories and mechanisms of the development of local suppliers in developing countries as well as to the methodology for conducting empirical research on such trajectories and mechanisms.

First, the present analysis showed that the firm-level capability building trajectory was an evolutionary and non-linear process involving major leaps and slower and even halted learning at different points in time. The earlier analyses of the evolutionary dimension of firm-level capability building are based on single case studies of leading large-scale corporations acquiring sophisticated capabilities. This book, by contrast, highlighted the heterogeneity of learning paths across small suppliers at the low end of the technological trajectory. A notable feature of

the present analysis was the application of a systematic framework for assessing different types and levels of capabilities across different firms. The in-depth analyses of supplier learning trajectories identified a supplier progressing directly from the operational level to the adaptive level bypassing the assimilative level (i.e., the new product introduction capability of supplier B4—a typical case of a *leap*), as well as several suppliers failing to make progress during more than a decade (examples of *halted learning*).

Second, this book showed that supplier learning is indeed explained in terms of the interactions between two actors—namely, the lead firm and the suppliers—and that the relative roles of such actors may change over time. Whilst the importance of integrating the analysis of the endogenous process of firm-level capability development with the understanding of mechanisms allowing the flows of knowledge between actors in GVCs has been proposed (Morrison et al. 2008), systematic empirical analysis was yet to be conducted to date.

The empirical analysis presented in this book demonstrated that the dynamic of capability building is one of exerting mutual influence by both the lead firm and the suppliers. Even in Japanese chains, where the power and dominance of the lead firms have often been emphasised, suppliers were not necessarily passive implementers of what lead firms demand. The in-depth comparative analysis of Stage III showed that suppliers, through their own actions, could influence learning outcomes and even induce the lead firm to adjust allocation of orders and other sourcing practices—albeit within the constraints of the lead firm's overall sourcing strategy. Where lead firm capability is limited—as was the case in Vietnamese–Chinese chains, suppliers may even become the key actor driving partial yet significant transformation of value chains away from market linkages. Although the paucity of capabilities possessed by the suppliers may have limited the extent of the transformation, the changes noted above were nevertheless critical in transforming Vietnamese–Chinese chains and generating competitive pressure on Japanese lead firms in the Vietnamese context. Where suppliers manage to acquire highly advanced capabilities, more dynamic industry-wide co-evolution may result.[1]

This book also makes a key methodological contribution by elaborating a systematic method for tracing the processes of change involving multiple flows of knowledge over an extended period of time, and by demonstrating the application of such a methodology in fact makes a significant difference in terms of the findings derived.

Specifically, this book integrated the essence of the GVC and TC approaches—a challenge that was identified by Morrison et al. (2008) but had not been implemented in previous empirical analyses of supplier learning. Such a synthesis was achieved by combining two analytical apparatuses developed for the present study: (1) a conceptual framework that considered the roles of both lead firms and

[1] The most prominent examples are the Taiwanese electronics industry (Sturgeon and Lee 2005) and the Indian software industry (Lema 2010).

suppliers in shaping learning trajectories and (2) an event-based approach designed to analyse the trajectories of firm-level capability building. Together, these analytical apparatuses made it possible to systematically trace the complex and multiple knowledge flows that contributed to supplier learning and to effectively observe changes over time.

The empirical application of the above approach to analyse the trajectories of supplier learning indeed demonstrates the power of longitudinal research because the timing of analysis did have a profound impact on the judgement of capability building at small developing country suppliers. The earlier literature is characterised by static analysis that associates each functional capability acquired with a certain type of value chain because the research only addressed the less dynamic period of learning up to the early 2000s. By extending the coverage to include a more recent period of capability building, the present book found a remarkable dynamism and heterogeneity of learning trajectories even among those suppliers that participated in the same types of value chain.

In this respect, this book is an important addition to the stock of longitudinal research on firm-level capability building (Bell 2006). While Bell (ibid.) argues for the power of longitudinal research drawing on studies of particular industries conducted by different researchers at different points in time (which are likely to be conducted according to different conceptual frameworks and methodological approaches), the present book pushes the research frontier a step further by utilising a single decade-long longitudinal study of a fixed set of strategically selected firms that adopts a fixed conceptual framework and methodology—and done by the same researcher—to demonstrate that judgements about capability building in fact change remarkably depending on the timing of the observation.

The case study design adopted in this research also deserves attention. Whist the bulk of the existing empirical analyses of firm-level capability building have adopted either in-depth examination of one or a few critical cases (Figueiredo 2000, 2002; Dutrénit 2000) or quantitative analyses of large numbers of samples with the aim of testing a limited number of specific hypotheses (Romijn 1999; Calghirou et al. 2004), this study deliberately chose to conduct in-depth analysis of a mid-sized sample selected on the basis of theoretical sampling. In a way, such a research design made it possible to combine the benefits of the two approaches: (1) the in-depth case study approach, which makes possible to analyse the evolving learning trajectories over time and diverse knowledge flows that conduced to the key learning events, and (2) the incorporation of a sufficiently large number of samples, which makes it possible for the research to accommodate the wide heterogeneity of learning trajectories across suppliers. The advantage of the former approach is most evident in the analysis of transformation of learning mechanisms in a small number of the most illuminating cases in a later stage of industrial development (Chap. 8), while the benefit of the latter approach is most clearly observed in the aggregated analyses of the learning trajectories and learning mechanisms in the earlier stages (Chaps. 6 and 7).

The methodological approach and design adopted by this research is likely to be useful for analysing fast-changing industries driven by active involvement of both

lead firms and suppliers as well as industries in which dominant players are in a constant state of change. In such industries, research that systematically traces the complex and multiple knowledge flows that contributed to supplier learning over time, paying close attention to the heterogeneity across cases, may shed light on dimensions of supplier learning that would have been difficult to grasp with conventional methodological approaches.

9.3 Development after 2009 and Its Implications

The Vietnamese motorcycle industry made significant headway during the decade covered by this study. Although the industry remains heavily protected from imports, there are indications that it has steadily raised its performance, and the virtuous cycle of a growing market, the formation of a component supply base and increasing productive performance have begun to turn.

Can Vietnam continue to develop its motorcycle component supply base further to become regionally competitive in the Southeast Asian motorcycle industry? Will the development of the component supply base continue to be driven by the two learning models outlined in this book? Although any answer to these questions must remain speculative, developments after 2009 suggest that the growth of the industry is likely to be increasingly driven by the Japanese for the foreseeable future. In 2011, the country's total motorcycle sales climbed to 3.34 million units, with the three incumbent Japanese manufacturers (Honda, Yamaha and Suzuki) accounting for 79 % of total motorcycle sales (Industrial Research Institute 2011). In the meantime, the share of local assemblers had dropped to 8 % (ibid.). Japanese motorcycle manufacturers continued to make large-scale investment in Vietnam,[2] not withstanding the government's announcement in 2008 of a reduction of tariffs on imports of motorcycles from ASEAN countries to 60 % by 2013.[3]

Moreover, there are signs that the competitiveness of Vietnam's component manufacturing industry has also been significantly strengthened, driven primarily by further consolidation of the Japanese learning model outlined in this book, i.e., imposition of challenging QCD targets by the lead firm and tight monitoring of the supplier performance, combined with intensified competition between suppliers. In an interview at the beginning of 2010, the president of Honda's regional R&D centre in Thailand pointed out that the growing competitiveness of suppliers in Vietnam was likely to make the country a promising ASEAN component supply base along with Indonesia (interview with Honda R&D Southeast Asia #1)—a scenario that could hardly be imagined 15 years ago.

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[2] Honda is set to expand its annual production capacity in Vietnam to 3 million units by 2013 (*The Nihon Keizai Shimbun Newspaper* 8 January 2012).

[3] Decision of the Ministry of Finance 36/2008/QD-TTg dated 12 June 2008.

However, there are indications that these new developments have made it increasingly difficult for local incumbent suppliers to survive in this industry, not to mention for new local firms to enter into component manufacturing—especially at the first tier. On one hand, the growing production of Japanese motorcycle manufacturers has induced a large number of foreign suppliers, Japanese in particular, to invest in Vietnam. Due to the increasing sophistication of consumer demand and the growing size of production, the quality and delivery requirements demanded by Japanese lead firms have been significantly upgraded. The growing production volume has made it possible for Japanese lead firms to practice dual sourcing for an increasing variety of the components required, which means that local suppliers now need to compete intensely with suppliers of all nationalities for orders. On the other hand, with the decline of local assemblers, the space for local suppliers catering to the demand for a wide variety of components without stringent process requirements has diminished significantly.

The above developments seem to suggest that competition among lead firms over the rapidly growing market has created new lead firm-supplier dynamics in both Japanese and Vietnamese–Chinese chains. Within the Japanese chain, the lead firm is likely to have emerged as an even more powerful actor with the capacity to choose suppliers and enforce increasingly challenging performance targets on them. The importance of the Vietnamese–Chinese chains is likely to have diminished as local assemblers have lost out to foreign motorcycle manufacturers. Further empirical research is needed to explore whether these developments are indeed leading to diminished space for local suppliers in the industry and how the new lead firm-supplier relationships affect local suppliers' capability building trajectories.

9.4 Limitations of the Research and Issues for Future Research

As discussed above, this book covered much ground and made important contributions to theory and methodology. The research is nevertheless subject to limitations because of its focus and the specific analytical approaches or methodologies adopted. However, the rich findings do suggest areas where further research would be worthwhile. These will be briefly outlined below.

First, this book adopted a case study methodology focusing on a strategically selected sample of suppliers. As discussed above, this was an ideal strategy for achieving two aims at once: engaging in a detailed, in-depth examination of the processes and mechanisms by which individual suppliers accumulated their capabilities, and systematically highlighting the heterogeneity of such processes and mechanisms. Such a strategy, however, is limited in the sense that the findings cannot be generalised to suppliers in the Vietnamese motorcycle industry or more generally to firms in developing countries. Nor do they tell us anything about the

degree of prevalence of the emerging patterns of capability building processes or mechanisms.

Second, whilst the present analysis adopted a qualitative framework for systematically assessing the levels of supplier capabilities at different points in time, the research fell short of providing quantitative assessment of suppliers' capabilities. To what extent did HVN's suppliers (of different nationalities) improve their productivity? How did such outcomes compare quantitatively with the performance of suppliers serving local assemblers? The research failed to address these questions.

In order to address the above two limitations, future research would require quantitative analyses of systematically sampled suppliers, although such attempts are likely to be possible only over short periods of time.

Third, this book focused on capability building performance among suppliers but fell short of assessing the suppliers' profitability and financial performance. The question of *Did the sophisticated capabilities acquired by the suppliers indeed enable them to capture larger profits?* is of particular importance if we are to know whether or not capabilities allowed the suppliers in the Japanese or Vietnamese–Chinese chains to enter sustainable growth paths. To explore this question, future research should look into the dynamics of bargaining relationships between the lead firm and the supplier in order to examine whether, and to what extent, the acquisition of sophisticated capabilities by the suppliers altered the power relations between the two actors and the distribution of profits within the value chains.

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Appendix
List of Firms, Interviews, and Surveys

1. Interviews in Thailand

Firms	Code	Interview details
Honda Thailand	#1	President and General Manager on 17 September 2004 (includes factory visit)
Honda R&D Southeast Asia	#1	President on 11 January 2010

2. Interviews in Vietnam

(1) Vietnamese Suppliers

Firm	Code	Interview details
A1	#1	Director of Planning Department on 17 October 2003
	#2	Deputy Director on 3 September 2008
	#3	Chairman; General Director; and Manager of Planning Department on 24 November 2008 (includes factory visit)
	#4	Chairman; General Director; Deputy General Director; Factory Manager; and five other managers on 3 March 2009 (includes factory visit)
A2	#1	President/General Director and Deputy Manager of Personnel Department on 5 September 2008 (includes factory visit)
	#2	Director of Technical Department on 19 November 2008 (includes factory visit)
A3	#1	General Director on 17 September 2008 (includes factory visit)
	#2	Deputy Manager of Technical Department on 20 November 2008
A4	#1	General Director on 16 October 2003 (includes factory visit)
	#2	General Director and Director of Technology Department on 9 March 2009 (includes factory visit)
A5	#1	General Director on 17 November 2009

(continued)

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(continued)

Firm	Code	Interview details
A6	#1	Director of Production and Director of Finance on 25 September 2004 (includes factory visit)
	#2	General Director on 11 September 2008 (includes factory visit)
	#3	Two Vice General Directors on 11 March 2009 (includes factory visit)
	#4	General Director on 13 January 2010
A7	#1	General Director on 20 November 2008
	#2	General Director on 5 March 2009 (includes factory visit)
A8	#1	Deputy General Director on 16 September 2008 (includes factory visit)
	#2	Manager of Engineering Department on 21 November 2008 (includes factory visit)
	#3	General Director on 13 January 2010
A9	#1	Managing Director on 28 July 2005 (includes factory visit)
	#2	President on 15 November 2008 (includes factory visit)
A10	#1	General Director and Director on 9 September 2008 (includes factory visit)
A11	#1	Manager of Finance and Deputy Manager of Sales on 12 March 2009 (includes factory visit)
B1	#1	Deputy General Director on 16 September 2008 (includes factory visit)
	#2	Managers of Technical Department, Equipment Department, Manager of Quality Control Department, and Technical Department No. 2 on 21 November 2008 (includes factory visit)
B2	#1	Director and Manager of Technology Department on 13 March 2009 (include factory visit)
B3	#1	General Director on 3 August 2005 (includes factory visit)
	#2	General Director on 5 September 2008 (includes factory visit)
B4	#1	General Director on 24 November 2008
	#2	General Director on 5 March 2009 (includes factory visit)
B5	#1	General Director and Director of Sales Department on 12 September 2008 (includes factory visit)
	#2	General Director and Manager of Accounting Department on 22 November 2008 (includes factory visit)
C1	#1	Director on 4 September 2008 (include factory visit)
C2	#1	General Director on 2 August 2005 (includes factory visit)
	#2	General Director on 8 September 2008 (includes factory visit)
	#3	General Director on 10 March 2009
C3	#1	General Director on 15 September 2008 (includes factory visit)
	#2	General Director on 10 March 2009
C4	#1	General Director on 4 March 2009
C5	#1	Managing Director and Factory Director on 14 March 2009 (includes factory visit)

(2) Honda Vietnam (HVN)

Code	Interview details
#1	General Director at the factory on 31 July 2001
#2	Director of Production and Director of Administration/Chief Financial Officer on 21 September 2004 (includes factory visit)
#3	Director of Administration/CFO on 20 November 2007
#4	Director and Senior Manager of Purchasing Department on 19 September 2008
#5	Director, Senior Manager, and Manager of Purchasing Department on 7 March 2009

(3) Vietnamese Assemblers

Firms	Interviews		Surveys
	Code	Details	
V1	#1	Head of Administrative Department on 22 September 2004 (includes factory visit)	2004/2007
	#2	Head of Administrative Department on 1 August 2005 (includes factory visit)	
V2	#1	Former procurement manager (2002–2004) on 24 February 2009	–
	#2	Former procurement manager (2002–2004) on 27 February 2009	
V3	#1	Officer of Administrative Department on 23 November 2007 (includes factory visit)	2007
V4	#1	Vice General Director on 23 September 2004	2004/2007
	#2	Vice General Director on 2 August 2005	
	#3	Vice General Director and Factory Manager on 4 August 2005 (includes factor visit)	
	#4	General Director and Deputy Director on 22 November 2007	
	#5	General Director on 4 March 2009	
V5	–	(Requests for interviews were rejected in 2004 and 2007)	2004/2007
V6	#1	General Director and Deputy General Director on 26 November 2007 (includes factory visit)	2007

(4) Japanese Suppliers

Firm	Code	Interview details
X	#1	General Director on 15 January 2010 (includes factory visit)

About the Author

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