THE ECONOMIC RISE OF CHINA AND THE TRANSFORMATION OF VIETNAM'S MOTORCYCLE INDUSTRY

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STATEMENT

I hereby declare that this thesis has not been previously submitted, either in the same or different form, to this or any other University for a degree.

Signature

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SUMMARY

This submission consists of a collection of four papers. Each paper stands on its own and makes a specific contribution to knowledge. However, the four papers are also closely connected, each providing a building block for understanding how China's economic rise has affected Vietnam's industrial development. Taken together, these papers show that the conclusion reached on how China's rise affects its neighbours depends fundamentally on understanding the changing dynamics over time. So as to unravel these dynamics, this collection focuses on the motorcycle industry and covers a period of a decade. At the beginning of that decade China's economic rise seemed to be a disaster for Vietnam's industrial development. By the end the decade, it turned out to have transformed Vietnam's industrial development and production capabilities.

At the heart of this intriguing dynamic is the competition between two models of industrial organisation. The first paper conceptualises the two contrasting models of industrial organisation that underlie the Japanese dominance and the Chinese catch-up in the Asian motorcycle industry. The second and third papers present the findings of the empirical research on Vietnam's motorcycle industry covering a period of a decade. The second paper shows that China's economic rise brought about repeated rounds of competition between the Japanese and Chinese models of industrial organisation attempting to gain supremacy in the third country market of Vietnam. The third paper shows that local component suppliers were able to build up considerable production capabilities in the course of the decade as the changes in industrial organisation created new learning opportunities for these suppliers. Drawing together the findings of the research, the fourth paper argues that the impact of China's economic rise on the development of Vietnam's motorcycle industry changed over a decade and that the changing impact can be explained in terms of successive changes in industrial organisation.

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ACRONYMS

AFTA	ASEAN Free Trade Area
ASEAN	Association of Southeast Asian Nations
CNC	Computer Numerically Controlled
FDI	Foreign Direct Investment
GVC	Global Value Chain
HVN	Honda Vietnam
IMF	International Monetary Fund
ISO	International Organization for Standardization
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
LCD	Liquid Crystal Display
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
VA	Value Analysis
VE	Value Engineering
VEAM	Vietnam Engine and Agricultural Machinery Corporation
VMEP	Vietnam Manufacturing and Export Processing Co., Ltd.
VNS	Vietnam Suzuki
WTO	World Trade Organisation
YVN	Yamaha Vietnam

EXCHANGE RATES

In this submission, amounts originally denominated in Vietnamese dong, Chinese yuan, and Thai baht are converted into US dollar using the annual average exchange rates in IMF (2011b).

INTRODUCTORY OVERVIEW

This submission consists of a collection of four papers. Each paper stands on its own and seeks to make a specific contribution to knowledge. However, the papers are also closely connected, each providing a building block for addressing the bigger question of how China's economic rise has affected industrial development of its less developed neighbours. This has been the question driving my doctoral research throughout; and throughout I have sought to answer it by focussing on the motorcycle industry of Vietnam. I had the opportunity to study this industry before embarking on my doctoral research and then built on this earlier experience by conducting further empirical research, this time with clearer analytical frameworks and methodologies. This introductory overview introduces the debate I seek to contribute to, presents brief summaries of the four papers, and the overall conclusions.

One of the most prominent developments in the global economy is the economic rise of China, driven primarily by the rapid development of its modern and diverse industrial sector. The impact of China's rise has been felt globally via international trade. Particularly for China's less developed neighbours, the threat of massive low-priced imports from China has emerged as one of the most serious concerns as they endeavour to develop their own industries.

The four papers contained in this submission focus on a critical yet largely overlooked dimension of China's economic impact on its neighbours: the dynamics of change. The existing literature has focussed primarily on the volume, direction, and composition of China's trade. However, although trade is important, it is not sufficient for understanding how China's rise affects industrial development of its neighbours. This requires understanding the dynamics of market competition and industrial transformation within the neighbouring countries.

So as to unravel these dynamics, the four papers focus on the motorcycle industry. In this industry, China achieved a phenomenal rise through the 1990s, even challenging the long-established position of major Japanese motorcycle manufacturers. The research presented here examines the experience of the Vietnamese motorcycle industry over a period of a decade – since the end of the 1990s. Early in the decade, the massive imports of low-priced Chinese motorcycles brought about severe damage to the nascent motorcycle industry in Vietnam. By the end of the decade, the competitive effects of this ‘China shock’ had transformed Vietnam’s industrial development and production capabilities. On the basis of historical evidence and recent empirical data, the four papers examine the dynamics of competition, organisational transformation and capability building that contributed to the changing impact of the China shock on Vietnam.

The first paper provides the theoretical background. It looks into one of the key factors that explain the rise of the Chinese motorcycle industry and its impact on Vietnam: industrial organisation. By drawing on the theory of global value chain governance, this paper conceptualises the model of industrial organisation that has emerged in the Chinese motorcycle industry. The rise of Japanese motorcycle manufacturers since the 1950s had been assisted by a model of industrial organisation prioritising quality. Chinese motorcycle manufacturers, by contrast, developed a distinctive organisational model prioritising low prices. This emerging model helped Chinese motorcycle manufacturers to attain remarkable levels of price competitiveness and thrive in the low-income segment of the global motorcycle market that had remained largely unexploited by the Japanese industry leaders.

The second and third papers show how China’s economic rise transformed Vietnam's motorcycle industry. Both papers cover the period of a decade starting in the late 1990s. While guided by theory, both papers concentrate on the empirical evidence for changes over time – which turned out to be substantial.

The second paper focuses on the transformation of industrial organisation. At the beginning of the decade, Japanese motorcycle manufacturers were only starting to transplant their conventional model of industrial organisation. The China shock triggered repeated rounds of competition between the Japanese and Chinese models of industrial organisation as the respective lead firms attempted to gain supremacy over the Vietnamese market. The initial round of organisational adjustments in the early 2000s, emphasised in the existing literature, were found to be short-lived, while longer-lasting changes came only towards the end of the decade. At this stage, the two organisational models were adjusted to meet the competitive challenges and adapted to the Vietnamese environment. The result was increased organisational diversity. The two models were transformed into hybrid forms that retained the essential features of the original models yet incorporated key adjustments to meet the Vietnamese environment.

The transformation of industrial organisation had a significant impact on the development of motorcycle component suppliers. The third paper therefore examines how the capability building trajectories of local suppliers evolved over time. At the beginning of the decade, Vietnam had an extremely limited pool of competent suppliers. Whilst the initial round of organisational transformation triggered by the China shock created new opportunities for local firms to enter into the production of motorcycle components, supplier capability remained relatively rudimentary. After a period of slow learning, supplier learning trajectories entered a more dynamic phase towards the end of the decade. Not only is this phase different from the previous periods in terms of the levels of capabilities acquired by the suppliers, with high-performing ones even reaching basic innovative levels, but it is also distinct in that supplier learning came to be driven by mechanisms that are qualitatively different from the previous periods. These suppliers are the bedrock of Vietnam's motorcycle industry today.

The fourth paper synthesises the findings of the previous papers and presents the conclusions of the whole research project. Drawing on the empirical materials presented in the previous papers and complementing them with additional data, this paper discusses how the China shock affected the development of Vietnam's motorcycle industry and elaborates two key contribution of the research to the literature on the impact of China's economic rise: showing empirically *that* China's impact changed over the period of a decade, and explaining *why* the impact changed over time. The paper argues that the competition between the Japanese and Chinese models of industrial organisation is central in explaining the shifting dynamics of market competition, formation of supplier capabilities, and lead firm performance.

In summary, the key original contribution that this submission as a whole makes lies in showing the dynamics of change – in industrial organisation, capability building, and industrial development – triggered by the rise of China. By conducting in-depth empirical research covering a period of a decade, the four papers not only capture and give accounts of the dynamics of change over time but also show that these changes indeed have a profound influence on the judgement of key issues being addressed.

PAPER I. EXPLORING THE SOURCES OF CHINA'S CHALLENGES TO JAPAN: MODELS OF INDUSTRIAL ORGANISATION IN THE MOTORCYCLE INDUSTRY

1. Introduction

The rise of the Japanese motorcycle industry after World War II was truly remarkable. Starting almost from scratch and fuelled by the growing demand for an inexpensive means of transport, and the engagement of a few hundred manufacturers, motorcycle production expanded rapidly in the 1950s (Alexander 2008). This was followed by the consolidation of manufacturers into four major companies: with the launch of the highly acclaimed Super Cub, Honda rapidly emerged as a global industry leader; and three other firms – namely Yamaha, Suzuki, and Kawasaki – successfully followed suit (Otahara 2000a). As early as 1965, Japan emerged as the world's largest producer and exporter of motorcycles, virtually driving previous industry leaders in Great Britain, Germany, and France out of business (Smith 1981; Wezel and Lomi 2009). Following expansion of exports and foreign direct investment (FDI), the four Japanese companies accounted for as much as 70% of global production in 1996.[1]

However, as so often happens, history repeated itself: by the end of the 1990s, Japanese dominance was being challenged by the rise of China. In 1993, its motorcycle production surpassed that of Japan, the former emerging as the world's largest motorcycle producer. By 2006, China accounted for as much as 33% and 49% of global motorcycle sales and production respectively.[2] The huge Chinese market was dominated by copies or slightly modified imitations of popular Japanese models that

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[1] Inclusive of production by foreign firms in receipt of technology transfer from the four Japanese companies (Otahara 2000a: 2–3).

[2] The author's estimation based on Honda Motor Co., Ltd. (2007).

were produced by local manufacturers and sold at approximately 30% to 70% of the price of the originals (Ohara 2005a: 69). Meanwhile, Japanese manufacturers – for virtually the first time in the long history of their overseas operations – only managed to capture a minimal share in the Chinese market. As of the end of the 1990s, about twenty foreign joint venture firms in China, ten of which were established by the four Japanese motorcycle manufacturers, together accounted for just 5% of the market (Ohara 2006a: 21). Moreover, China's challenge was not limited to the domestic market, as it expanded exports to Southeast Asia, Africa and Latin America from the late 1990s onwards.[3]

This paper addresses one of the critical factors that have sustained the prolonged dominance of Japanese manufacturers in the global motorcycle industry: industrial organisation. The substantial body of research on the Japanese automobile industry has shown how a distinctive model of industrial organisation characterised by long-term, trust-based supplier relationships has sustained product development and manufacturing performance (Smitka 1991; Clark and Fujimoto 1991; Nishiguchi 1994; Dyer 1996; Fujimoto 1999). Emerging research into the Japanese motorcycle industry suggests that a similar form of industrial organisation has contributed to the high level of manufacturing performance of this sector (Boston Consulting Group 1975; Ohara 2001, 2006a; Otahara 2006).

The phenomenal rise of the Chinese motorcycle industry since the 1990s raises a series of questions. How did it manage to challenge the established position of Japanese motorcycle manufacturers, which once seemed so unshakable? What form of industrial organisation enabled the Chinese to achieve their remarkable levels of price-based

[3] 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).

competitiveness? Did they emulate the Japanese model of industrial organisation but apply it in a better way, or did they develop a distinctive model of their own?

Specifically, this paper addresses the following research question: *What form of industrial organisation enabled Chinese motorcycle manufacturers to challenge Japanese motorcycle manufacturers?* It argues that rather than emulating the conventional Japanese model, Chinese motorcycle manufacturers developed a completely different form of industrial organisation. The resultant distinctive model enabled them to realise types of competiveness that differed significantly from those of the Japanese industry leaders, and allowed Chinese firms to thrive in a low-income portion of the global motorcycle market that was largely unexploited by the Japanese. The paper teases out the essence of the two contrasting models of industrial organisation that have emerged in Japan and China, and discusses their respective strengths and weaknesses, as well as trajectories of change, in an explicitly comparative manner.

Primarily, the paper builds on existing empirical research into the Japanese and Chinese motorcycle industries. Conducted mostly by Japanese and Chinese academics, the bulk of such research has focussed on *describing* in depth the emerging patterns of industrial development, product development practices, and/or supplier systems in either or both of the two countries under study.[4] In contrast, the present paper *conceptualises* the two models of industrial organisation, adopting a common theoretical framework and an explicitly comparative mode of analysis. Given that both models have evolved, the focus is on each of their conventional forms: the Japanese model in the 1970s up to the early 1990s, and the Chinese model in the 1990s. Nevertheless, the paper also examines

[4] Existing empirical studies include Ohara (2001, 2004a, 2006b, 2006d), Otahara (2000a, 2000b, 2005, 2006, 2007, 2009a, 2009b), Hashino (2007), Demizu (1991, 2005), Tomizuka (2001), Otahara and Sugiyama (2005), and Alexander (2008) on Japan; and Ohara (2001, 2004a, 2004b, 2005a, 2005b, 2006a, 2006b, 2006c), Ge and Fujimoto (2004, 2005), Matsuoka (2002), Sugiyama and Otahara (2002), and Otahara and Sugiyama (2005) on China.

their respective transformations in the 2000s on the basis of the literature as well as the author's fieldwork in 2004, covering Honda and three of its major motorcycle component suppliers. The details of the interviews are provided in Appendix 1. Interviews cited in this paper are referred to by firm and interview codes as explained in Appendix 1.

The remainder of the paper is structured as follows. Section 2 provides the theoretical framework. Sections 3 and 4 respectively conceptualise Japanese and Chinese models of industrial organisation in their conventional forms. Section 5 compares the two models and discusses trajectories of change. Section 6 concludes the paper by summarising its main findings, and identifies and discusses areas for future research.

2. Theoretical Framework

This section develops a theoretical framework for describing and explaining different forms of industrial organisation, which is based on a revised version of Gereffi et al.'s (2005) theory of global value chain (GVC) governance. The section begins by introducing the concept of value chain governance, followed by a consideration of five dominant governance types. It then discusses the two key variables that determine value chain governance. The section concludes by presenting a revised framework that uses these two variables to explain the emergence of the five aforementioned types of value chain governance.

2.1 Industrial Organisation: Meaning and Type

An industry comprises (groups of) firms engaged in one or more value-adding function that is required to bring products to market – typically referred to as a value chain

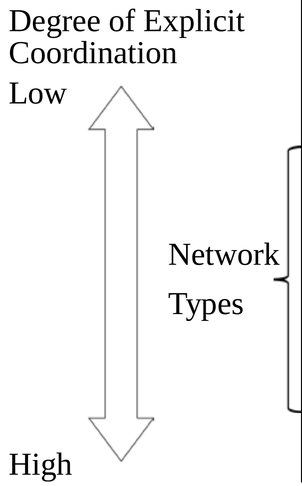
(Sturgeon 2001). The literature on industrial organisation has evolved around the broad question of how the upstream to downstream functions surrounding a product are aligned to different (groups of) firms, and how relations between these firms are coordinated. Starting with the literature on large integrated corporations (Chandler 1977) and transaction cost economics (Williamson 1979), through to theories on network forms of organisation (Powell 1990) and the GVC approach (Gereffi et al. 2001; Schmitz 2004; Gereffi et al. 2005; Sturgeon 2008), the resultant large body of work has demonstrated the range of market and non-market mechanisms through which inter-firm relations are coordinated. These mechanisms – referred to by the GVC approach as types of value chain *governance* – are important because they influence competitive performance of industries and development prospects for local firms participating in value chains (Sturgeon 2002; Schmitz 2004).

While there are myriad patterns of value chain governance, Gereffi et al. (2005) classified value chain governance into five dominant types, which were mapped onto a spectrum running from low to high levels of explicit coordination (Figure I-1). At one end of the spectrum is the arm's-length market in which transactions are mediated by market forces. At the other end of the spectrum there is a hierarchy in which coordination takes the form of an internal command structure within a vertically integrated corporation. In between these two extremes, there are intermediate or network forms of organisation that are neither based on markets nor a hierarchy (Powell 1990; Jones et al. 1997). In ascending order of explicit transactional governance, these are:

- Modular chains, 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 chains, which are characterised by complex and intense interaction between mutually dependent parties
- Captive chains, in which a powerful lead firm makes extensive intervention and exercises control over smaller and dependent suppliers

Figure I-1. Types of Value Chain Governance



Type	Description
Market	Arm’s-length transactions mediated by market forces
Modular	Product standardisation enables firms to exchange complex information without intense interaction or mutual dependence
Relational	Intense two-way interaction and mutual dependence
Captive	Lead firms make extensive intervention and exercise control over dependent suppliers
Hierarchy	Vertically-integrated organisation

Source: The author, based on Gereffi et al. (2005).

2.2 Determinants of Value Chain Governance

Why do different forms of governance such as those discussed above exist? And under what circumstances do particular governance forms emerge? The strength of Gereffi et al.’s (2005) formulation of GVC governance theory is that it provides a systematic device for answering these questions. Specifically, they seek to explain the dynamics of value chain governance in terms of three variables: (1) the complexity of information exchanged in a transaction; (2) the degree to which such information can be codified; and (3) the supplier’s capability level relative to the requirements of a transaction.

This study follows the overall structure of this framework, but makes the following adaptations. First, for the sake of simplicity, the first two variables are grouped into one broader category: the nature of product and process parameters exchanged in transactions.

Second, whereas Gereffi et al. (2005) concentrate on the *codifiability* of parameters, this study focuses on the degree to which these parameters are *standardised*, a related yet distinct concept. This is because degrees of product and process standardisation constitute one of the essential factors that differentiate the Japanese and Chinese models of industrial organisation in the motorcycle industry.[5]

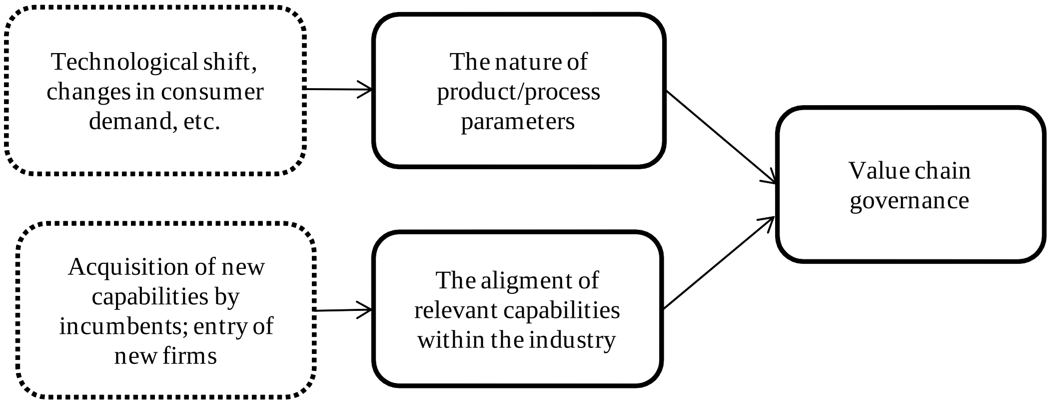
Third, the present study's framework incorporates lead firm capability in addition to supplier capability. Because the primary focus of Gereffi et al. (2005) is on the *global* value chains that are coordinated by major transnational corporations (TNCs), they implicitly assume that lead firms possess the sophisticated capability necessary to coordinate value chains. On the contrary, the present study does not take lead firm capability as a given in view of the fact that it addresses the organisational model emerging in a developing country context. Rather, it acknowledges that a lead firm may be constrained by a shortage of capability in its attempt to establish certain types of chain governance.

Fourth, rather than narrowly focussing on *relative* levels of capability, that is, whether or not supplier capability meets the level required by lead firms, the present study highlights the various *types* of capability that different governance mechanism models impose on both lead firms and suppliers.

[5] This adaptation becomes critical in formulating the conditions under which captive chains emerge. Whereas Gereffi et al. (2005) focus on the *codifiability* of parameters in the form of lead firm instructions, the *non-standard* nature of product and process parameters turned out to be critical in explaining why Japanese motorcycle manufacturers had instituted explicit governance mechanisms in coordinating transactions with their suppliers.

The basic structure of this adapted framework is shown in Figure I-2, in which value chain governance is determined by two variables: the nature of product and process parameters communicated in transactions; and the alignment of relevant capabilities within the industry. The following subsections examine the two variables individually.

Figure I-2. Value Chain Governance: An Explanatory Framework



Source: The author, adapted from Gereffi et al. (2005) and Langlois and Robertson (1995).

2.2.1 The Nature of Product and Process Parameters

The nature of product and process parameters determines the need for transactional governance. It is not the case that every transaction requires explicit coordination; the extent to which transactional governance is required depends primarily on the type of product being traded (in this case, motorcycle components). The specific focus will be on levels of complexity and degree of standardisation, both of which are influenced by factors such as technological innovation and changes in consumer demand.

In respect of simple products, which also tend to be standardised, there is limited need for instituting explicit transactional governance: if components are simple and standardised, product/process parameters can be specified and communicated with ease. Supplier performance is easily observable in the form of delivered outputs and thus detailed monitoring mechanisms are not required. Moreover, as standard products do not require transaction-specific investment, there is no need to implement safeguards against the risks of opportunism (Williamson 1979). Standard products can also be produced by a range of suppliers, sold to a variety of lead firms, or produced for stock and supplied as necessary (Gereffi et al. 2005).

The need for coordination increases as products become complex and differentiated, that is, as they start to take on new demands beyond price level (Schmitz 2006; Humphrey and Schmitz 2008). Examples include differentiated components that are more difficult to design and/or manufacture; higher quality levels; tighter delivery requirements in terms of either frequency or punctuality; and additional functional requirements (e.g. suppliers take on design responsibilities in addition to manufacturing). Implementing new requirements such as these often constitutes an additional burden with regard to the communication of product and/or process parameters between the lead firm and its suppliers. It also necessitates additional mechanisms to ensure that parameters are adhered to, for example, detailed monitoring (Schmitz 2006).

The need for explicit governance also depends on the extent to which parameters are standardised. On the one hand, non-standard parameters require explicit coordination because they incur additional coordination costs and transaction-specific investment in physical and/or human resources (Williamson 1979). This is particularly the case for products with integral design 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). Designing these products requires the coordination of detailed design tasks (Ulrich 1995), and their manufacture necessitates transaction-specific investment, both of which call for explicit governance mechanisms to be in place.

On the other hand, even when the product is complex, industry-wide product and/or process standards may reduce the need for explicit governance (Gereffi et al. 2005). In industries that produce products with modular architecture, standards make it possible to communicate product and/or process parameters without intense interaction, which releases firms from being locked into particular trading relationships (Langlois and Robertson 1992, 1995).

2.2.2 The Alignment of Relevant Capabilities

The need for transactional governance, however, does not mean that such mechanisms can necessarily be implemented in practice. This is where the second variable of the alignment of relevant capabilities within the industry comes into play. Governance means that a given firm enforces parameters over other firms, a dynamic that demands the ability to wield power (Schmitz 2006; Sturgeon 2008). The relative power relations between a lead firm and its suppliers, in turn, are determined primarily by the types and levels of capability enjoyed by the respective parties (Sturgeon 2008; Schmitz 2006; Palpacuer 2000).

A lead firm's capacity to impose parameters on its suppliers usually stems from their core competencies in strategic value chain functions (Palpacuer 2000; Schmitz 2006). In capital-intensive sectors such as the automotive industry, such strategic functions typically include product development, marketing, and manufacturing of core components. These functions often constitute the key sources of competitive advantage enjoyed by the lead firm because they require knowledge- and experienced-based assets that are difficult for others to imitate, and because they provide economies of scale for the firms that control these functions (Palpacuer 2000: 378).

A lead firm's control over strategic value chain functions matters because it tends to create two types of dependence on the part of the suppliers. First, lead firm control over strategic functions leaves suppliers with non-core functions (Palpacuer 2000), rendering them *functionally* dependent on the lead firm in marketing their products. Second, because dominance in respect of product, marketing, and/or branding often enables lead firms to gain a high degree of control over the market (Gereffi 1999; Kaplinsky and Morris 2000), they often overwhelm suppliers with huge purchasing power (Sturgeon 2008), rendering them *financially* dependent.

The size of orders takes on particular importance in industries in which product and process parameters are non-standard. 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.[6]

However, it is necessary to analyse lead firm competency in relative terms. Because power is relational, suppliers may also acquire it by building core competencies, that is, technical or service capabilities that are difficult to replace and become indispensable to the lead firm (Schmitz 2006; Sturgeon 2008; Palpacuer 2000). Suppliers can also gain the generic capability to assume responsibility for a bundle of functions, such as product

[6] Sturgeon et al. (2008) corroborate this point in arguing that the concentrated structure of the car manufacturing industry helps each firm to impose its own idiosyncratic standards on suppliers.

design, process development, purchasing, and production, which enables them to serve a diverse pool of customers and switch customers if necessary (Sturgeon 2008). In contrast, where suppliers only possess capabilities that are easily substituted and/or are embedded in relations with specific customers, the lead firm retains the capacity to choose and replace suppliers, thus keeping supplier power under control (ibid.).

2.3 The Revised Framework

Table I-1 shows how the five governance types mentioned in Section 2.1 can be explained in terms of different combinations of the two variables outlined in the previous subsection. When product and process parameters are simple and standardised, *market-based chains* emerge. This type of chain makes limited capability demand of lead firm and suppliers alike, the minimum requirements being that they possess routine assembly capability and routine component manufacturing capability respectively.

When industry-wide standards of compatibility enable complex parameters to be exchanged without explicit coordination, *modular chains* emerge whereby suppliers acquire generic manufacturing capacity and related service capabilities that enable them to serve multiple lead firms simultaneously. On the other hand, while the minimum requirement of the lead firm is routine assembly capability using mutually compatible components sourced from suppliers, modular chains enable it to focus on creation, penetration and defence of markets for its end products (Sturgeon 2002).

As product and process parameters become complex and non-standard, three types of chain governance may emerge depending on the alignment of relevant capabilities. The first case is one in which the lead firm and its suppliers are equipped with complementary competencies that cannot easily be sourced elsewhere. Such a situation gives rise to a *relational chain* whereby the lead firm and its suppliers are engaged in intense two-way interaction; the two parties are mutually dependent and the power relation is symmetrical (Gereffi et al. 2005).

Table I-1. Types of Chain Governance and their Determinants

	Product/ Process Parameters	Lead Firm Capability	Supplier Capability
Market	Simple	No specific requirements beyond routine manufacturing/assembly capabilities	
Modular	Complex/ Standard	A minimum of routine assembly capability suffices. Lead firms usually focus on creation, penetration and maintenance of markets for end products.	Generic manufacturing and related service capabilities.
Relational	Complex/ Non-standard	Lead firms and suppliers possess complementary competencies that are hard to substitute.	
Captive		Capacity to exercise dominance over suppliers, which usually stems from control over strategic chain functions.	A minimum of the basic ability to engage in a narrow range of simple tasks is required. Suppliers develop capabilities in accordance with the lead firm's interventions.
Hierarchical		Capability to conduct the value-adding functions in question.	Supplier capability is withheld.

Source: Adapted from Gereffi et al. (2005), Sturgeon (2002), Langlois and Robertson (1995), Sturgeon et al. (2008), Schmitz (2006), Sturgeon (2008), and Palpacuer (2000).

The second case is characterised by substantial asymmetry in capability levels between a large, competent lead firm and smaller, less competent suppliers. Competence and power asymmetry lead to a *captive chain* whereby the lead firm engages in extensive intervention, such as active monitoring and technical assistance; while suppliers develop their capabilities – typically, in a narrow range of tasks – under the lead firm's guidance (Schmitz 2004, 2006).

The last case is one in which limited available external capability makes outsourcing unfeasible, meaning that the lead firm is compelled to conduct the required function(s) in-house, that is, to create a *hierarchy*. A hierarchy may also result from cases of substantial asymmetry in competence levels (i.e. the second case discussed above) but where the lead firm is either unwilling or unable to engage in extensive intervention.

3. The Captive Japanese Model

The captive model of industrial organisation has been one of the key factors behind the prolonged leadership of Japanese motorcycle manufacturers since the 1960s. This section discusses the origins and distinguishing features of this model in accordance with the framework introduced in Section 2.

3.1 Complex and Non-standard Parameters

In the Japanese motorcycle industry, lead firms have traditionally organised relations with suppliers that reflected the nature of the product and process parameters they sought to enforce. Critical in this regard was the nature of the *dominant design* – the old yet highly successful Super Cub model. Over the five decades following its launch in 1958, this model shaped product and process parameters in the industry.

Up to the mid-1950s, two types of product prevailed in the Japanese motorcycle market, both of which were characterised by simple and standardised product parameters.[7] One was represented by poor quality imitations of imported British and German models. Leading experts on the history of the Japanese motorcycle industry note that

[7] Debate around the Japanese motorcycle industry up to the mid-1950s is based on the commentaries of Tomizuka (2001), Demizu (1991), and Alexander (2008). As Alexander (2008) points out, the nature of the product, mode of production, and form of industrial organisation at this time was surprisingly similar to the situation in the Chinese motorcycle industry in the 1990s.

domestically manufactured models of the period were mediocre in terms of engineering precision, quality and product performance, all aspects that largely failed to compete with foreign-made vehicles (Demizu 1991: 67; Tomizuka 2001: 100).

The other type of product was the motorised bicycle, which, again, imitated models imported from Europe. Since such vehicles could be produced by simply attaching an external two-stroke engine to a bicycle (Otaraha 2000a), which itself had modular design architecture (Galvin and Morkel 2001), fine-tuning in terms of component integration was not required. Both types of product were produced by a large number of assemblers and suppliers that operated on an arm's-length transaction basis (Demizu 1991; Alexander 2008).

Honda's launch of the Super Cub in 1958 marked a major technological breakthrough. Unlike the copies of imported European motorcycles or motorised bicycles that had preceded it, the Super Cub was conceived and designed by Honda exclusively to meet the demand of small Japanese businesses to deliver goods (Pascale 1984; Otahara 2000b). Featuring landmark technological innovations such as a four-stroke engine, overhead valves, an automatic centrifugal clutch, and an electric starter, the model recorded remarkable levels of capacity, speed and fuel efficiency that substantially exceeded world standard levels of the period (Demizu 1991). The safe and user-friendly appearance of the model, together with its affordable price also appealed strongly to Japanese consumers (Pascale 1984). Most notably, Honda designed the Super Cub by means of integral architecture so that all its components were customised to this particular model. Not a single Super Cub component was used in common with Honda's other models (Otahara and Sugiyama 2005).

This highly successful model not only led to the closure of nearly two hundred Japanese firms engaged in the production of imitation motorcycles, but also enabled Honda to infiltrate and eventually dominate the North American and European markets (Christensen 2002; Demizu 2005). Fifty years on, the basic production technology remains unchanged (Ohara 2006b). Technological shifts observed in the automobile industry, such as standardisation of vehicle platforms and modularisation (Humphrey 2000; Sako 2005; Takeishi and Fujimoto 2005), have so far not been implemented in the motorcycle industry (Ohara 2006b: 70). The Super Cub continues to be one of Honda's most popular models produced globally[8] and is used by other motorcycle manufacturers as a benchmark for the development of new products (Ohara 2006b). Considering the exceptionally high market shares this model has maintained in Japan and abroad over an extended period, the Super Cub may be seen as a typical example of a *dominant design* (Abernathy and Utterback 1978; Abernathy and Clark 1985; Teece 1986).

The emergence of the Super Cub as a dominant model significantly transformed the nature of innovation in the industry. Subsequently, Honda and the three other companies that successfully followed suit – namely, Yamaha, Suzuki and Kawasaki – opted to launch proprietary models incorporating new component technology, changes in specifications, and/or design modifications, aimed at improved product performance and/or adaptation to meet the consumer demand of Japanese and overseas markets (Demizu 1991; Otahara and Sugiyama 2005; Ohara 2006b). Every time new models were launched, motorcycle manufacturers renewed the designs of the whole vehicle as well as those of individual components (Otahara and Sugiyama 2005). Given the integral product architecture, incremental product innovations of this sort called for

[8] Honda's cumulative production of the Cub series reached 60 million units by 2008 (http://world.honda.com/news/2008/c080521Cub-Series/, accessed 16 September 2010), which was roughly one-third of the company's cumulative global production of motorcycles.

intricate fine-tuning between components (Ohara 2006d; Otahara 2009a). Thus, product parameters became complex and non-standard.

The emergence of the *dominant design* also lent increasing importance to process innovation for incremental improvements in productivity (Abernathy and Utterback 1978). Reflecting the integral design architecture, Japanese motorcycle manufacturers made themselves liable for provision to their consumers of a quality guarantee for the product system as a whole (Otahara 2009a, 2009b). Therefore, they took the lead in instituting their own engineering standards[9] and ensuring that common targets for the achievement of high levels of quality, costs and delivery (QCD) were pursued simultaneously for all of the components of a product. Accordingly, process requirements also became complex and non-standard.

3.2 Lead Firm Concentration of Capabilities

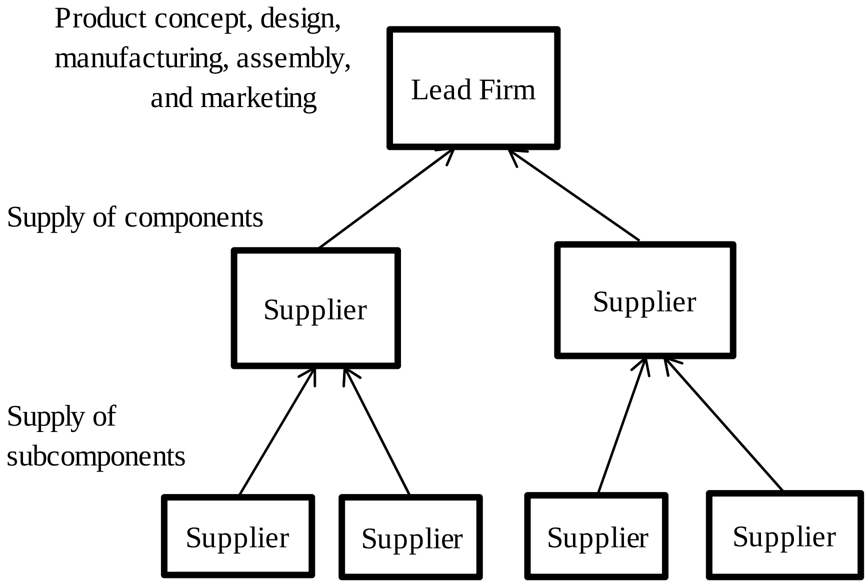
The second key variable that determines the pattern of industrial organisation is the structure of relevant capabilities. With the closure of the hitherto numerous assemblers of imitation motorcycles and motorised bicycles, the Japanese motorcycle industry grew highly concentrated. By the 1970s, the four emergent major motorcycle manufacturers had gained dominance of the growing domestic market and, subsequently, global sales via exports and FDI (Otahara 2000a).

Each of these four motorcycle manufacturers developed a pyramidal, hierarchical network of suppliers with the lead firm at the top of the pyramid (Figure I-3). As was the case in the car industry (Sturgeon et al. 2008), the need for customised components led each manufacturer to develop supply networks of its own and to enforce its

[9] For example, the Honda Engineering Standard (HES) includes component dimensions, material specifications, and details of the requisite processing.

idiosyncratic product standards on the suppliers. Large market shares meant that manufacturers were able to place orders that were sufficiently large to sustain small suppliers.[10]

Figure I-3. Hierarchical Organisational Model in the Japanese Motorcycle Industry



Source: The author.

These four powerful motorcycle manufacturers virtually monopolised capabilities in the industry. Equipped as they were with thorough knowledge of product development, production and marketing, they had the capability to conduct most core value chain functions in-house (Ohara 2006b). Particularly in the domain of product development and manufacturing, capabilities possessed by Japanese motorcycle manufacturers extended from the whole vehicle to most individual parts, even those outsourced to external suppliers.[11] The only exceptions were a limited number of components requiring specialised product and production technologies that the motorcycle

[10] In 1981, production volumes of Honda, Yamaha, Suzuki and Kawasaki in Japan were 2.9, 2.5, 1.5 and 0.5 million units, respectively (Honda Motor Co., Ltd. 1996).
[11] As Japanese manufacturers imitated European motorcycle designs in the early years of their development, they sought to absorb both the overall product design and individual component technologies (Otahara and Sugiyama 2005).

manufacturers did not possess, for example, clutches, carburettors, and tyres (Otahara 2006).

Moreover, the intrinsic core of the capability possessed by Japanese motorcycle manufacturers was not confined to capability to conduct individual functions along the motorcycle value chain; even more important was their capability to integrate various value chain functions from product development to manufacturing and marketing. Indeed, effective use of market information for coordinated improvement in product and process engineering acted as an important channel for Japanese motorcycle manufacturers to achieve incremental innovations that helped them to realise high quality, better manufacturability, and improved productivity.[12]

The sophisticated capabilities possessed by Japanese motorcycle manufacturers meant that a relatively narrow range of tasks had to be outsourced. Value chains included two types of supplier with different capability requirements. At the heart of this supply network were suppliers that had acquired proprietary component technologies that lead firms did not possess. As discussed above, lead firms' control over much of the component technology meant that such suppliers were extremely limited. These suppliers collaborated closely with the lead firm in the process of product development by undertaking detailed design of core components (Otahara 2006). The remaining suppliers, which were in the majority, were in the peripheral position of providers of non-core components. These firms were expected to provide external manufacturing *capacity* rather than complementary competencies, that is, the manufacture of

[12] Ohara (2006d). Also corroborated by lecture by a former engineer of Honda Motor Co., Ltd. for the Asian Motorcycle Industry research project organised by the Institute of Developing Economies, 6 August 2004.

components in accordance with drawings developed and supplied by a lead firm.[13]

Most suppliers were closely aligned to one of the four major motorcycle manufacturers.[14] Suppliers of core components in particular developed capital and personnel ties with manufacturers and constituted key members of their corporate groups referred to as *keiretsu*.[15] Japanese motorcycle manufactures, with the exception of Kawasaki, also established supplier associations (*kyoryokukai*). For example, Honda developed supplier associations in two locations where its motorcycle factories were located.[16] By organising suppliers located in these areas, including those of non-core components, Honda provided technical and managerial guidance in order to bring their competence up to the required levels (Otahara 2007).

In short, the industry adopted a highly concentrated structure, with lead firms dominating core capabilities.

3.3 Captive Governance

The need for suppliers dedicated to providing a stable supply of large quantities of high-quality, customised components, combined with asymmetrical alignment of capabilities, resulted in captive governance. Under this form of organisation, the lead firm practiced a high degree of control and intervention over smaller and dependent

[13] In the early years of its motorcycle operations, Honda was known for its dependence on in-house manufacturing of components as this tended to be more efficient than outsourcing to external suppliers (Otahara 2000b). As the company expanded production in Japan and overseas, it developed its supplier networks and expanded outsourcing. As of the 2000s, Japanese motorcycle manufacturers outsourced 80% of components in terms of cost (Otahara 2006).

[14] There were also *independent suppliers* not affiliated to specific motorcycle manufacturers (Ohara 2006b).

[15] For example, the Honda Group consisted of 57 member companies, including 23 component suppliers, sales firms, engineering firms, and a research and development (R&D) unit (IRC 2009).

[16] Interestingly, Honda is known for not having established a supplier association for its car business (Sako 1996); however, the company has two supplier associations in respect of motorcycle production: Yurin-kai in Kumamoto and Satsuki-kai in Hamamatsu (IRC 2009).

suppliers in order to encourage them to develop lead firm-specific competencies.

For the suppliers' part, entering into Japanese chain meant guaranteed long-term business. Suppliers could expect large orders over the long term because, once cemented, lead firm–supplier relations were maintained indefinitely other than in truly exceptional circumstances.[17] Where supplier capabilities fell short of the required levels, lead firms provided various forms of assistance to bring them up to standard. This was particularly necessary in the early stages of industrial development when lead firms faced a shortage of suppliers with the ability to meet their requirements (Hashino 2007).

Lead firms also provided enabling conditions for suppliers by mitigating and absorbing the risks of customer-specific investment associated with designing and manufacturing customised components. Such risk was mitigated as competencies possessed by lead firms significantly reduced the failure rate of new product development projects (Ohara 2004a). Risks were also absorbed because lead firms fully or partially bore the cost of customer-specific investment in developing prototypes, and manufacturing dies and moulds (Ohara 2001).

The other side of the coin, however, was that suppliers were virtually locked into relations with particular customers and were under pressure to reach the goals and specifications set by lead firms. The lead firm typically informed suppliers of its business plans, as well as detailed instructions and specifications based on its own idiosyncratic product and process standards. Suppliers were even advised of the lead firm's future product strategy at an early stage (Ohara 2001). Accordingly, suppliers were expected to invest in locations, machinery and human resources specific to their

[17] As corroborated by data provided by Otahara (2006).

customer's requirements; devote most of their resources and efforts to achieve goals and fulfil plans set by the former; and submit to close monitoring of their performance against lead firm requirements.

Suppliers were also required to disclose detailed information to lead firms on their internal operations, extending to detailed cost data as the basis for joint problem-solving exercises in the quest for possible ways of reducing costs at source (Ohara 2001, 2004a).[18] Gains made from such joint efforts were in principle divided between the lead firm and the supplier in accordance with the rules of reasonable profit sharing (Ohara 2001), as was the case in the Japanese car industry (Nishiguchi and Brookfield 1997). However, in effect, suppliers ceded their autonomy to independently negotiate the proportion of rent that had accrued from their own incremental process innovation, and sacrificed their ability to search for new customers.

Over time, suppliers developed the narrow range of manufacturing capabilities necessary to process the components in accordance with lead firm specifications and requirements (Otahara 2006). Where suppliers acquired complementary competencies in component technology that the lead firm had to depend on, they began to collaborate closely with their customers in the development of new product designs. In such cases, lead firm–supplier relationships exhibited features of relational governance, that is, intense two-way information flow. Yet, the lead firm's control over product and production technology in this industry meant that such instances were extremely rare; even in comparison with the country's car industry (Otahara 2006) – a classic example of captive organisation (Sturgeon et al. 2008). The majority of the suppliers were in

[18] These initiatives are often referred to as value analysis (VA) and value engineering (VE).

subordinate positions as suppliers of non-core components.[19]

The captive model of industrial organisation was indeed one of the key factors behind the success of Japanese motorcycle manufacturers in launching proprietary models and manufacturing them to high standards. The model served Japanese motorcycle manufacturers well in their attempts to conquer the world market – but only until the early 1990s; by then, they faced new challenges arising in the developing world (Ohara 2006b). The details of these challenges and the subsequent trajectories of organisational change are discussed in detail in Section 5.

4. The Market-based Chinese Model

In the Chinese motorcycle industry, there has emerged a form of industrial organisation strikingly different from the conventional Japanese model discussed in the previous section. The present section conceptualises the Chinese model as it emerged in the 1990s – the industry's initial fast-growth phase. While the Chinese motorcycle industry consists of diverse players who cater for different sections of a huge market, the focus is on large indigenous manufacturers,[20] both state-owned and private, which, at the end of the 1990s, accounted for roughly 60-70% of the market (Ohara 2006a: 27).

[19] According to the survey of motorcycle component manufacturers in Hamamatsu – one of Japan's two main centres of motorcycle production along with Kumamoto – conducted jointly by Hamamatsu Credit Association and the Research Institute for Shinkin Central Bank in 2003, 68.1% of the 119 respondents considered their bargaining power vis-à-vis their largest customers to be weak (Otahara 2006: 112).

[20] According to Ohara (2004a), these firms correspond to the second of the three categories of motorcycle manufacturer in China. The first consists of foreign-invested manufacturers that produce expensive proprietary models; and the third comprises indigenous small-size manufacturers that focus almost exclusively on assembling low-priced copies of foreign models by externally sourcing standardised components. Ohara (2004a: 27) notes that over time, the patterns of competition observed among motorcycle manufacturers in the first and third categories have tended to converge towards those that are evident among manufacturers in the second category.

4.1 Low-Quality and De Facto Standardisation

As the discussion in the previous section demonstrated, a centralised form of industrial organisation long persisted in the Japanese motorcycle industry primarily because of integral product architecture. The Chinese succeeded in developing a new organisational model precisely because they succeeded in breaking such a constraint. However, this process did not follow the common route of industry standards being established by dominant firms or international organisations (Gereffi et al 2005; Galvin and Morkel 2001). As will be explained in detail below, de facto standards of component compatibility emerged in the Chinese motorcycle industry endogenously as a result of uncoordinated actions by numerous firms within the sector.

Unlike manufacturers' proprietary models that prevailed in the Japanese motorcycle industry, those produced by Chinese companies in the 1990s were mainly low-quality and low-priced copies, or slightly modified imitations of a limited number of popular Japanese models. The designs of roughly a dozen of the latter, 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 numerous newly emerging private manufacturers by the 1990s (Ohara 2001; Ge and Fujimoto 2004). Among such Japanese models, the most popular was again Honda's highly renowned Super Cub, this and several other models becoming de facto standards in the Chinese industry. While the number of models registered with the Chinese authorities increased rapidly, reaching 18,000 by the end of 2000 (Ohara 2005b: 58), those marketed under either Chinese or imitated Japanese brands were mainly copies of a dozen most popular Japanese models, sometimes incorporating minor functional and/or cosmetic modifications.

Clearly, de facto standardisation of this sort occurred due to demand-side conditions specific to the Chinese market. First, it took place under weak protection of intellectual property rights (Ohara 2006a). Second, Chinese consumers prioritised low prices over quality.[21] The fact that the Chinese authorities prohibited the use of motorcycles in large cities and on highways (ibid.) further reinforced this tendency.

De facto standardisation and low quality requirements brought about corresponding changes in the nature of innovations, which were now limited in both degree and scope. As duplicative imitation of Japanese models became widespread, product development and marketing – which formed the intrinsic core of lead firm activity in the Japanese motorcycle industry – assumed little significance. In terms of product development, Chinese lead firms did not generally opt for the kind of whole product system renewal that had occurred in the Japanese motorcycle industry. Although many of the large manufacturers did engage in modifications to Japanese base models, these tended to be minor, usually consisting of changes in only one or two components or varying combinations of existing components (Ohara 2004a: 49). It also made little sense for firms to engage in extensive marketing or branding activities for products that were essentially imitations. In the domain of production, the low expectations of Chinese consumers meant that lead firms faced limited pressure to engage in quality improvement.

The above changes in the nature of innovation substantially reduced the need for explicit coordination between the lead firm and its suppliers, although – as will be argued below – the need for coordination was not eliminated completely. Lead firm requirements on suppliers focussed predominantly on low prices; and because products

[21] Ohara (2004a: 67) notes that many consumers in China do not care as long as motorcycles run.

basically followed de facto standard designs, limited fine-tuning between component specifications was called for. The lead firm and its suppliers could therefore engage in motorcycle assembly and component manufacturing respectively largely (but, as we shall, see not completely) without intense interaction.

It should be noted that de facto standardisation must be distinguished from modularisation, their apparent similarity notwithstanding.[22] Since the Chinese did not change the design architecture of motorcycles, 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. However, this has not been the case: as will be discussed in depth in Section 4.3, uncoordinated duplicative imitation in China has frequently produced components that are not strictly compatible. De facto standardisation in the absence of a shift in design architecture therefore needs to be differentiated from product modularity, which ensures full compatibility between the component modules comprising the product.

4.2 Wide Distribution of Basic Manufacturing and Reverse Engineering Capabilities

Up to the early 1990s, the Chinese motorcycle industry was dominated by a small number of large state-owned manufacturers such as Jialing and Qingqi, which until then had been consistently ranked as the largest in the country (Ohara 2006a). After the launching of market-oriented economic reforms in China in 1979, these state-owned manufacturers shifted their production from military armaments to motorcycles with the introduction of Japanese technology under formalised licensing agreements (ibid.).

[22] The apparent resemblance has led several authors to describe on-going practices in the Chinese motorcycle industry as modular production (Matsuoka 2002; Pham Truong Hoang 2007). See Paper II for detailed discussion on this issue.

They subsequently laid the foundations of the industry by developing integrated production systems and supply networks, and training a large pool of engineers and managers (ibid.).

De facto standardisation radically transformed the landscape of the Chinese motorcycle industry by significantly lowering the entry barrier for both manufacturers and suppliers. Instead of playing the role of integrators of various value chain functions (as was the case with their Japanese counterparts) lead firms could now purchase and assemble standard components readily available on the market. This meant that the minimum requirement of them was the capacity to assemble components. Likewise, suppliers no longer had to invest in equipment, human resources, or skills specific to individual customers; in order to operate as a motorcycle component supplier, simple reverse engineering capabilities in terms of reproducing existing components and routine manufacturing now sufficed.

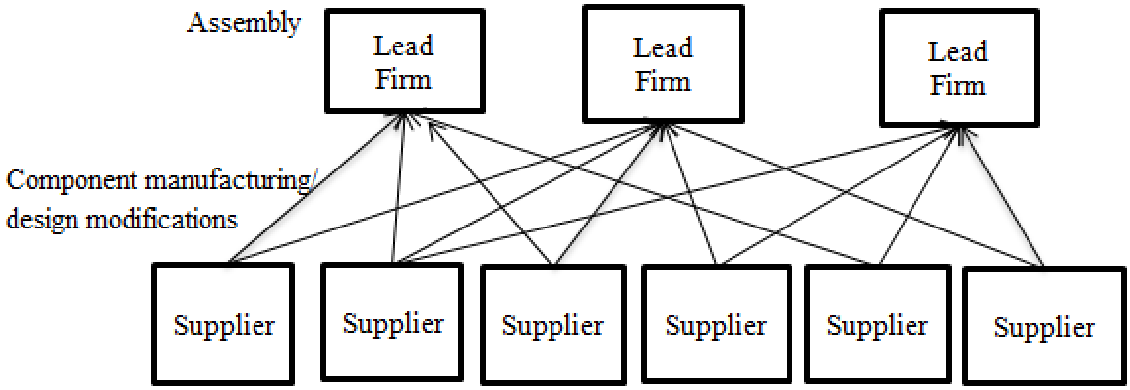
As a result of the engagement of a large number of companies – including many private firms that had hitherto operated in unrelated fields – in assembly and component production, the structure of the Chinese motorcycle industry became highly fragmented. The number of motorcycle manufacturers increased in the 1980s and 1990s, reaching 140 in 1997 (Ohara 2001: 7). In 1999, the market shares of the largest 10 and 20 manufacturers were 53.1% and 68.0% respectively (ibid.). The industrial structure was also fluid, as demonstrated by recurrent changes in the names of top companies (Ohara 2006c). Jialing saw its market share decline throughout the 1990s until it accounted for only 6.7% of the total number of motorcycles produced in China in 2001 (Ohara 2004a). Meanwhile, newly emerging manufacturers rapidly expanded their production. From the mid-1990 onwards, numerous private firms also entered into the manufacturing of motorcycle components, absorbing a large number of engineers, technicians and managers who had previously worked for state-owned enterprises (SOEs) in mechanical, steel or chemical industries (Ohara 2004b).

However, both motorcycle manufacturers and suppliers only possessed basic levels of technological capability. Many of the newly emerging private motorcycle manufacturers in particular had limited knowledge of overall product systems or individual component technology, and thus started operations by purchasing and assembling components available in the market (Ohara 2004b). For example, Zongshen, one of the three major private local motorcycle manufacturers based in the southwestern city of Chongqing – the main centre of motorcycle production in China, was established in 1992 by a ceramic engineer (ibid.).

Whereas large state-owned motorcycle manufacturers had opted to develop supply networks of their own in the 1980s, lead firms and suppliers grew increasingly independent of each other in the 1990s, a tendency that led to the emergence of dispersed supply networks, meaning that suppliers were no longer tied to particular lead firms (Figure I-4). Ohara's (2001: 17) interviews with eighteen suppliers of core components to the three major motorcycle manufacturers at the end of 1990s found that suppliers on average traded with 14.9 customers; and the largest customer on average accounted for just 40.5% of the sales of suppliers' main products.[23] Lead firms were not dependent on particular suppliers either, manufacturers normally maintaining multiple – usually three or more – suppliers of each type of component (Ohara 2001: 18).

[23] Since this figure only represents suppliers' main products, their overall dependence on the main customer was most probably much lower.

Figure I-4. Dispersed Organisational Model in the Chinese Motorcycle Industry



Source: The author, with reference to Ohara (2001, 2006c).

4.3 Arm's-Length Transactions Mediated by Market Forces

De facto standardisation and low quality requirements combined with the wide distribution of basic reverse engineering and manufacturing capabilities led Chinese motorcycle manufacturers to make extensive use of market forces in doing business with their suppliers. Many lead firms as well as suppliers engaged in arm's-length transactions characterised by intense competition, frequent switching of partners on the basis of price, and low levels of explicit coordination. Specific patterns of transactional governance, however, varied according to the type of transaction. In this subsection, we examine how transactional governance worked in practice.

Let us start with the simplest case, namely, instances in which Chinese firms simply replicated existing Japanese models. While such practice was typically seen among small- and medium-size manufacturers, large manufacturers often adopted this approach for a certain range of their products (Ohara 2005b). In these instances, de facto standardisation virtually eliminated the need for explicit coordination. Suppliers engaged in duplicative imitation of components independently of the manufacturer, who, in turn, purchased standard components readily available on the market. The resulting pattern of transactional governance assumed an arm's-length form in which many lead firms and suppliers competed intensely on the basis of price.

However, as discussed in Section 4.1, de facto standardisation did not completely eliminate the need for lead firm–supplier coordination. The fact that integral design architecture was maintained meant that full compatibility of components could only be ensured insofar as they were manufactured precisely in accordance with the original drawings of the dominant models, which was frequently not the case. Since suppliers adopted different measuring methods and varying degrees of precision in reproducing design drawings of components available on the market, repeated duplicative imitation of a given dominant model often gave rise to components that were not compatible with each other (Ge and Fujimoto 2004). 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.

Let us proceed to cases in which modifications were made to Japanese models – a practice typically observed among larger Chinese motorcycle manufacturers. Where changes were made to parts that functionally interact little with other components (such as plastic covers, tyres, speedometers, and shock absorbers), the story was essentially the same as the instances of duplicative imitation referred to above. Since the absence of coordination between adjacent components did not substantially affect the overall performance of a product, arm's-length transaction with little explicit coordination prevailed, although ad hoc ex post adjustments were often necessary. Suppliers prepared modified designs independent of their customers, intentionally keeping the interface with other components standardised so that they could be sold to a large number of unspecified customers (Sugiyama and Otahara 2002). In turn, manufacturers sought to purchase and assemble varieties of components that were available on the market instead of generating own-product concepts and basic product design (Otahara and Sugiyama 2005).

Where modifications were made to core functional components that required coordination with related parts in order to yield superior product performance (e.g. engine components, carburettors, and silencers), the story was more complicated. In theory, such transactions required a flow of tacit information to facilitate fine-tuning between components as well as reconciliation of competing incentives to overcome the risks of customer-specific investment (Williamson 1979). However, in practice, the realities of market conditions in China, the limited capabilities of lead firms, and the lack of safeguards against the risks of opportunism prevented both lead firms and suppliers from committing themselves to the development of non-standard designs that adopted customised components.

On the one hand, in a market where few consumers were willing to pay a high premium for sophisticated designs, consumer demand changed rapidly, and intellectual property rights were only weakly protected, lead firms investing in non-standard designs faced substantial risks. Instead of mitigating and absorbing the risks of model-specific investments, as had been the case with Japanese motorcycle manufacturers, they switched the risks to their suppliers by outsourcing the design and manufacture of mutually interacting components to more than one supplier without making a commitment to bear the cost of developing prototypes or investing in dies and moulds

(Ohara 2001).

On the other hand, suppliers receiving orders for developing modified component designs faced the following two types of risk (Ohara 2001, 2004a). One was the possibility that the new product development project would fail (e.g. if it was terminated before the new model was launched, or if it was launched but production fell short of the minimum efficient scale). Given the volatile nature of the Chinese market and the weak sales capabilities of motorcycle manufacturers, such risks were substantial.[24] The other type of risk to suppliers concerned the possibility that the manufacturer might adopt a competitor's component design, a real possibility insofar as many lead firms engaged in the multiple sourcing of components (Ohara 2001).

Faced with considerable risks, suppliers naturally avoided making customer-specific investment wherever possible. Instead of investing in customised dies and moulds, they often sought to utilise existing equipment to develop prototypes for modified component designs (Ohara 2001). While this served as a safeguard against the risks of non-purchase by the lead firm, the scope of the adjustments that could be made to existing component designs became increasingly limited.

Suppliers also intentionally kept the shapes of interfaces between components standardised so that they would at least be assembled together with other standard components on the market (Ohara 2004a). This was intended to ensure that suppliers would be able to find alternative customers in cases of non-purchase, even if such usage failed to maximise overall product performance. Overall, even in terms of mutually

[24] According to Ohara's (2004a) interviews with 17 Chinese suppliers, 12 admitted that they faced substantial risk concerning the possible failure of product development projects. One of them described that only about two of the ten product development assignments it had secured from manufacturers had succeeded and generated profits while the remaining eight had failed.

interacting components, the degree of coordination remained generally limited and component designs were not necessarily bespoke to specific customers.

In summary, arm’s-length, adversarial transactional relations largely mediated by market forces came to the aid of the Chinese motorcycle industry in its realisation of remarkable levels of price-based competitiveness. The organisational model, however, reached a turning point in the 2000s. Its background and ensuing transformation are discussed in the next section.

5. Comparison of Models and Trajectories

This section compares the two models presented in sections 3 and 4 respectively, and discusses the strengths and weaknesses as well as trajectories of change of each.

5.1 Comparison of the Two Models

Table I-2 compares the two organisational models. Under the conventional Japanese model, the lead firm engaged in centralised control and extensive intervention in governing its relationships with dependent suppliers. In turn, the suppliers were expected to endeavour to achieve the targets set, often by ceding autonomy.

The strength of the Japanese organisational model lay in its capacity to develop proprietary products and manufacture them to a high quality standard. In the domain of product development, intense interaction involving extensive information sharing with a limited number of core component suppliers enabled the lead firm to develop proprietary models that were internally and externally coherent (Clark and Fujimoto 1990). In terms of manufacture, the combination of tight control and generous assistance practiced by powerful lead firms helped to extract superior productive performance from suppliers that were specialised in narrow manufacturing tasks. High-grade supplier performance in manufacturing (and design, for suppliers of core components) helped lead firms to launch proprietary models and manufacture them to high standards – a key source of their competitiveness.

Table I-2. Comparison of Japanese and Chinese Models

Feature	Japanese	Chinese
Nature of product/ process parameters	Non-standard and complex	Simple
Product standards	Idiosyncratic: determined by the lead firm	Endogenously emergent as a result of de facto standardisation
Overall industrial structure	Concentrated and stable	Dispersed and fluid
Capability distribution	Monopolised by the lead firm	Basic capabilities widely distributed
Degree and mechanism of coordination	High: based on lead firm control and assistance	Low: based on market forces
Advantages	High quality and incremental cost reduction Proprietary product designs with high levels of novelty	Low prices Flexibility and speed in launching new products
Disadvantages	Rigidity (possible high costs) Long product development cycle	Difficulty in product differentiation

Source: The author.

However, the Japanese model also suffered from inherent weaknesses. High quality often came at the expense of high costs, as long-term transactions tended to create rigidity in lead firm–supplier relationships.[25] Even though incremental cost reduction via process improvement was an integral element of lead firm requirements of suppliers, limited competition between them and the high priority attached to quality standards meant that radical price reduction was not possible. This was particularly evident in the

[25] According to a survey of motorcycle component manufacturers in Hamamatsu in 2003 (see footnote 19 for details), 52.5% of the 122 respondents had traded with their largest customers since establishment and another 44.4% had traded with their largest customers for a considerable length of time (Otahara 2006: 112).

case of *keiretsu* suppliers of core components, whereby manufacturers had close relations with suppliers via capital and personnel ties.

The regular renewal of the whole vehicle – the Japanese approach to product development – also resulted in extended product development cycles and limited flexibility. As of the end of the 1990s to the early 2000s, it generally took a year for Japanese motorcycle manufacturers to develop new models and the development cycles were virtually fixed (Ohara 2001). While the Japanese policy of launching a limited number of highly sophisticated models generally worked well in a mature, less volatile market, its inability to promptly and flexibly make adjustments to product designs inhibited the adaptation of this model to a growing, volatile Chinese market in which consumer demand was in a constant state of rapid change.

Above all, the strength of the arm's-length model of Chinese industrial organisation lay in its capacity to achieve low prices. Low entry barriers for both manufacturers and suppliers assisted by de facto standardisation enabled a large number of firms to enter into production of motorcycles and components, spurring intense competition. The benefits of the arm's-length model also extended to its speed in launching new models, typically ranging between two to three months as of the end of the 1990s (Ohara 2001). De facto standardisation of Japanese base models enabled independent suppliers to concentrate on design modifications and manufacturing without having to get locked into relations or interact intensely with specific customers. In turn, lead firms could experiment flexibly with different minor improvements by purchasing and assembling various components available in the market.

However, the Chinese model suffered from limited capacity to achieve differentiation in product design and quality, the use of standard components resulting in a proliferation of largely homogeneous products. To the extent that integral product architecture was maintained, repeated duplicative imitation adopting different measuring methods and varying degree of precision in reproducing design drawings of the Japanese models available in the market meant making compromises in respect of component compatibility and precision, while the ad hoc approach to dealing with non-compatibility problems only provided partial solutions. At the same time, given intense price-based competition and the difficulty of devising measures for monitoring product quality, suppliers had little incentive to improve product quality.

5.2 Trajectories of Change

While the discussion so far has focussed on the two organisational models in their conventional forms, the ways in which they were implemented evolved over time. This subsection considers trajectories of change, focussing on recent developments in the respective models.

The two models generally converged in the 2000s, yet fundamental differences still remain. In terms of the Japanese system, changes occurred in the degree to which lead firms and suppliers were tied into particular relations. During the emergence of Japanese supply networks in the 1960s through to the mid-1990s, this organisational model was characterised by high levels of lead firm–supplier dependence. Because they required competent suppliers, lead firms explicitly sought to develop exclusive ties with them by organising supplier associations and providing technical, financial and managerial assistance to nurture small, less competent suppliers (Ohtahara 2007; Hashino 2007). As supplier competence increased over time, lead firm assistance gradually diminished. However, up to the 1990s, lead firms maintained tightly organised value chains with exclusive membership, and suppliers became increasingly dependent on large, regular orders placed by their main customers (Otahara 2007).

The Japanese model encountered a turning point around the end of the 1990s. The impetus for change came from a sharp decline in motorcycle production in Japan from over 7 million units in the early 1980s to 2.3 million – a level at which manufacturers found it difficult to place orders that were sufficiently large to sustain their suppliers[26] – in 1999 (Honda Motor Co., Ltd. 1986, 2006). The declining production in Japan compelled Japanese motorcycle manufacturers to adjust their sourcing practices. For example, Honda started encouraging its suppliers to diversify their customer bases and become independent.[27] While such a strategy was not intended to dismantle long-established supplier relations altogether, Honda started to expose incumbent suppliers to market forces by partially sourcing components from non-*keiretsu* suppliers in Japan as well as firms based in Southeast Asia.[28]

As a result of these changes, tightly integrated networks started to dissipate. However, not all actors experienced these developments evenly. Lead firms sounded out new suppliers beyond their long-established networks, and this meant that the suppliers – even those with capital ties with lead firms – faced intense competition and pressure to reduce costs.[29] The only exceptions were those equipped with proprietary component technologies for which substitutes were difficult to find.[30] On the other hand, the progress of customer diversification among suppliers remained relatively modest. As of

[26] 1999 was the first year when the domestic production of Honda, the largest among the four Japanese motorcycle manufacturers, fell below one million to 846,000 units (Honda Motor Co., Ltd. 2006).

[27] Interviews with Honda suppliers JJ2 #1 and JJ3 #1.

[28] Interviews with Honda suppliers JJ2 #1 and JJ3 #1. Lecler (1999) and Ahmadjian and Lincoln (2001) discuss similar changes in Japanese electronics and car manufacturers.

[29] In spite of enjoying capital relations with Honda, JJ2 and JJ3 faced much stiffer competition as they only possessed competencies that could be easily sourced (interviews with Honda suppliers JJ2 #1 and JJ3 #1).

[30] JJ1 possessed complementary product technologies and continued to receive 100% of Honda's orders (interview #1).

2003, 47.3% of 414 Japanese motorcycle component suppliers traded with only one manufacturer, whilst 15.5%, 12.8% and 24.4% traded with two, three and four manufacturers respectively (Otahara 2005: 21). Again, suppliers of core components having proprietary technology are in a relatively better position to explore new customers beyond their main clients.[31]

Meanwhile, the Chinese model also met with a significant turning point in the early 2000s. Again, the impetus for transformation came from changes in market demand, consumers beginning to seek out higher-quality motorcycles (Ohara 2006a, 2006c). The government also implemented stringent quality and environmental standards, and cracked down on the infringement of intellectual property rights (ibid.). As a result, the sales of low-quality but otherwise faithful copies of Japanese models seriously stagnated, and the Chinese market came to be dominated by better-quality products that incorporated more sophisticated functional and/or cosmetic modifications to Japanese base models, a trend that called for a higher degree of lead firm–supplier coordination (ibid.).

Corresponding changes occurred in industrial structure and organisation. In contrast to the dispersed industrial structure of the 1990s, the industry was consolidated in the 2000s under a smaller number of relatively large motorcycle manufacturers with the capacity to engage in research and development (R&D) for design modifications, and the manufacturing capability to achieve better product quality. The market data show limited changes in the names of the top companies between 2001 and 2005[32] (Ohara 2006c).

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[31] According to the author's calculation based on IRC (2009), as many as 17 of 42 suppliers (equivalent of 40% – substantially higher than the average ratio noted in the text) having direct capital relations with Honda traded with *all* of the four Japanese motorcycle manufacturers. JJ1 was a typical example of such suppliers (interview #1).

[32] These include Grand River, Lifan, Loncin, Zongshen and Sudiro Honda (Ohara 2006c).

As market requirements came to necessitate a higher level of coordination around product and/or process parameters, industrial organisation also started to shift away from the arm's-length pattern towards one characterised by higher levels of lead firm coordination. Ohara's (2006c) surveys from 2001 to 2004 confirm some signs that lead firm–supplier relations became characterised by closer interaction and mutual dependence. For example, transactions between major lead firms and their suppliers stabilised, with fewer instances of switching partners, and the former started to partially or wholly bear the cost of model-specific investment in dies and moulds. However, the same study suggests the limits of such transformation. Multiple sourcing persisted, albeit among a smaller number of suppliers; lead firms and suppliers engaged in limited systematic sharing of information; and lead firms still lacked the will and capacity to provide technical assistance to their suppliers (ibid.). This suggests that transactions continued to be mediated to a considerable extent by market forces.

In summary, both Japanese and Chinese models underwent important transformations in the 2000s, primarily in response to changing market and competitive environments. However, fundamental differences between the two models remained to a considerable extent, as organisational transformation was constrained by the existing alignment of capabilities in each country.

6. Conclusion

This paper set out to enquire into the form of industrial organisation that enabled Chinese motorcycle manufacturers to challenge the dominance of Japanese motorcycle manufacturers which had remained intact for nearly four decades. The above discussion has demonstrated that Chinese manufacturers did indeed develop a distinctive form of industrial organisation that enabled them to attain types of competitiveness strikingly different from those of the Japanese industry leaders. Up to the early 1990s, the conventional Japanese model of industrial organisation proved resilient in serving the mature and sophisticated motorcycle markets of the developed world. Given intricate relations between the overall vehicle and components typical of products with integral architecture, a high degree of explicit coordination was required by lead firms to achieve incremental product and process improvements (Ohara 2006d).

In contrast, the strength of the Chinese model lay in its capacity to achieve low prices, flexibility, and speed of adjustment. This paper has explained the emergence of arm’s-length linkages in the Chinese motorcycle industry in terms of two variables. The first was de facto standardisation of popular Japanese models, which progressed through endogenous, uncoordinated moves on the part of numerous assemblers and suppliers. Notably, this allowed dispersed, arm’s-length linkages to emerge even in the absence of changes to the integral design architecture.

The second was the wide distribution of basic reverse engineering and manufacturing capabilities that had accumulated during the long history of industrial development in China. With its strength in the production of large quantities of low-priced imitations of popular Japanese models, the arm’s-length organisational model enabled Chinese motorcycle manufacturers to capture the lion’s share of the huge yet volatile domestic market, in which consumers prioritised low prices and where intellectual property rights were only weakly protected.

By drawing on the emerging body of empirical research into the Chinese motorcycle industry, this paper has taken a first important step in conceptualising the distinctive form of industrial organisation emerging in China in explicit comparison with the

Japanese model. However, further research is necessary to explore the relevance of the model to other industries and settings. First, there is the question of whether such a model is specific to the motorcycle industry or whether it may be observed in other Chinese industries. The emerging body of research in the field seems to suggest the latter may indeed be the case, in showing that arm’s-length linkages between large numbers of lead firms and suppliers have prevailed in the mobile telephone handset, liquid crystal display (LCD) television, and car industries (Imai and Shiu 2011; Shintaku et al. 2009; Marukawa 2007).

The case of the car industry deserves particular attention because, similar to the motorcycle industry, the Chinese approach to the de facto standardisation of existing products has given rise to loosely coordinated organisation in an industry in which integral product architecture has long acted as a major obstacle to breaking centralised organisation within developed country contexts (Sturgeon et al. 2008). The next important step in this line of research is to integrate the growing number of industry-level case studies to investigate whether there are indeed common Chinese patterns across industries. The organisational model conceptualised in this paper could well provide an appropriate starting point for such an attempt.

Second, there is the question of whether the Chinese model can be transferred to different contexts. The existing literature shows that the Japanese model has not only been transplanted by the country’s lead firms via FDI but has also been emulated and adapted by Japan’s competitors (Cusumano and Takeishi 1991; Sako 1992; Helper and Sako 1995; Kaplinsky 1995; Posthuma 1995a, 1995b; Harriss 1995; Humphrey et al. 1998). Whilst there have not been any serious attempts to tackle this question in relation to the Chinese model, the analysis in the present paper suggests a number of focal issues for future research in this direction.

Contrary to the case with the Japanese model, the limited degree of lead firm coordination inherent in the Chinese model implies that its transplantation abroad may not be driven primarily by the engagement of lead firms in FDI. In fact, the expansion of Chinese motorcycle manufacturers to locations outside China has thus far occurred mainly in the form of exports without long-term commitment to engage in local production (Ohara et al. 2003). This suggests that the possibility of the Chinese model being replicated outside the country depends largely on the distribution of basic reverse engineering and manufacturing capabilities in host countries, as well as their ability to demonstrate the entrepreneurial dynamism necessary to seize new business opportunities – both of which are the most striking features of Chinese industrial development.

The most promising candidate for this line of research is probably Vietnam, which experienced massive inflows of Chinese motorcycle imports as early as the turn of the century (Fujita 2011). Further study is necessary to determine whether the Chinese model itself was transferred to Vietnam as a consequence and, if so, what impact this had on Vietnam’s industrial development.

Paper II. The Japanese and Chinese Models of Industrial Organisation: Fighting for Supremacy in the Vietnamese Motorcycle Industry

1. Introduction

In the 1980s, the Japanese manufacturing industry was at the forefront of research on economic development and competitiveness. In an attempt to determine the sources of Japanese competitive advantage, researchers examined how the distinctive models of intra- and inter-firm organisation – characterised by lean production and trust-based supplier relations – contributed to the sustainment of superior product development and manufacturing performance (Smitka 1991; Clark and Fujimoto 1990, 1991; Nishiguchi 1994; Dyer 1996; Fujimoto 1999; Lecler 2004). It is now acknowledged worldwide that the hierarchical, captive model of inter-firm organisation consisting of a powerful lead firm and closely aligned suppliers helped Japanese manufacturing firms to achieve superior product development and productivity performance; thus, establishing leading positions on major world markets, where consumers valued high quality, product differentiation, and fast product innovation.

The influence of the Japanese model was not restricted to the domestic market. As Japanese firms expanded abroad via FDI, the original model was transferred and adapted to different country contexts. As Japanese and local firms engaged in rounds of organisational competition and adaptation in the host country environment, various hybrid forms of industrial organisation emerged, which resulted in increased organisational diversity (Cusumano and Takeishi 1991; Sako 1992; Helper and Sako 1995; Guiheux and Lecler 2000; Ernst 2002; Sturgeon 2007). The Japanese 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, 1995b; Harriss 1995; Humphrey et al. 1998).

Two decades later, the global industrial landscape has changed. As the growth centres of the world's leading manufacturers have shifted to developing countries, Japanese manufacturers face major challenges from Chinese firms, which have attained overwhelming cost advantages by means of a distinctive form of industrial organisation. The existence of a uniquely Chinese model of industrial organisation has not been recognised widely. In Paper I, based on the literature and my own analysis, I sought to establish the key features of the Chinese model of industrial organisation, which I found to be characterised by intense price-based competition between a large number of lead firms and suppliers engaged in arm's-length transactions. Such an organisational model has enabled Chinese firms to attain remarkable levels of price-based competitiveness that challenge the Japanese industry leaders.

Paper II investigates the new patterns of rivalry emerging out of the rise of the Chinese model of industrial organisation. It does so by examining what happens when the two models of industrial organisation, coming from Japan and China respectively, clash in a third Asian developing country that seeks to establish its competitive industry. Which model is more adaptable to local conditions? Is one superior to the other? Do they exist side by side? Does competition open up space for a distinctively different model of industrial organisation? How do firm responses vary over time? These are the questions that this paper seeks to address.

Indeed, the aforementioned questions are at the forefront of research on economic development and competitiveness. There has long been a discussion on the relevance of models of industrial organisation for the pace and patterns of economic development. This line of research asks: how important have models of industrial organisation been in their countries of origin; how relevant are they for other countries; can they be transferred; and, if so, what adjustments need to be made? These and similar questions were raised by a group of researchers in a special issue of *World Development* in 1995.[33] The overall conclusion reached was that research on industrial organisation needs to extend beyond models to analyse the trajectories of diffusion and adaptation (Humphrey 1995).

However, although the importance of analysing trajectories of organisational change is widely recognised, this has rarely been done systematically. One of the major obstacles in this regard has been the lack of a conceptual device for systematically explaining the complex processes of organisational transformation, which are shaped by a myriad of factors – technological, strategic, institutional, and social. Nevertheless, recent theoretical development in the field of GVC governance perhaps offers a way forward (Gereffi et al. 2005).

The present paper utilises an adapted version of Gereffi et al.'s (2005) framework of GVC governance to describe and explain the short- and medium-term dynamics of organisational adaptation arising from the clash of Japanese and Chinese models. In so doing, it seeks to highlight the challenges and tensions that firms might face in the process of organisational transformation, and how such problems could be overcome.

In examining the clash of the Japanese and Chinese models in a third country context, the paper takes the context of Vietnam and examines the case of its motorcycle industry.

[33] Special issue on 'Industrial Organization and Manufacturing Competitiveness in Developing Countries', Vol. 23 No.1.

The rationale for focussing on this sector is because the motorcycle industry is the one in which a direct clash between the two models is most prominent, and Vietnam was the first locality outside China in which they clashed head-on and fought for supremacy. It is now well known that the massive imports of low-priced Chinese motorcycles into Vietnam in the early 2000s had a huge impact on the Japanese industry leaders (Cohen 2002). What is less well known is that there were repeated rounds of organisational adaptation triggered by the emergence of Vietnamese motorcycle assemblers inheriting the Chinese organisational model. The ensuing competitive adaptation of both Japanese and Chinese organisational models generated enormous industrial dynamism, eventually leading this latecomer developing country to emerge in a decade as one of the world's major motorcycle producers.[34]

This paper examines how the Japanese and Chinese models were transformed through competitive adaptation in Vietnam over a period of a decade. Specifically, it addresses the following main research question:

> *How has the clash between Japanese and Chinese organisational models affected the organisational transformation of the Vietnamese motorcycle industry?*

This research question is explored through an examination of the Vietnamese motorcycle industry over the decade following the late 1990s. The focus is on two sets of value chains representative of the Japanese and Chinese models of industrial organisation respectively. Drawing on data collected at different periods from interviews and surveys of lead firms and suppliers, this study engages in an in-depth, longitudinal

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[34] Production of motorcycles in Vietnam began in 1996 (General Statistics Office 1999). In 2006, domestic production and sales recorded 2.1 and 2.4 million units, respectively, making the country the world's fourth largest producer of and market for motorcycles after only China, India and Indonesia (General Statistics Office 2009; Honda Motor Co., Ltd. 2008).

analysis of how the two sets of value chains were transformed as the respective lead firms competed for supremacy in the Vietnamese market.

The remainder of the paper is structured as follows. Section 2 reviews the existing literature, identifies research gaps, and elaborates questions and corresponding hypotheses derived from previous research. Section 3 presents the conceptual framework. Section 4 discusses the research methodology and operationalises the key concepts. Sections 5 and 6 comprise the empirical core of the paper, presenting analyses of the dynamic transformation of the Japanese and Chinese models of industrial organisation respectively in the Vietnamese motorcycle industry. Section 7 summarises the findings of the paper and discusses its contribution to the literature on organisational models and trajectories.

2. Literature Review

The purpose of this section is to review the existing literature of direct relevance to the research question explored in this paper. This covers three main strands of literature: the literature on models and trajectories of industrial organisation in general; the literature on Japanese and Chinese models of industrial organisation in particular; and the emergent literature on the Vietnamese motorcycle industry. Based on gaps identified in the course of this review, the section concludes by refining the research question and presenting resultant hypotheses.

2.1 Industrial Organisation: From Models to Trajectories

The 1980s and 1990s saw a flourish of research on industrial organisation. Spurred by the varieties of patterns by which industries were organised – from large and vertically integrated business corporations to clusters of small, networked firms, or hierarchical networks consisting of a dominant lead firm and layers of smaller suppliers, researchers looked into the origins of different patterns and their implications for economic competitiveness (Chandler 1977; Dore 1983; Smitka 1991; Womack et al. 1990; Clark and Fujimoto 1991; Sako 1992; Nishiguchi 1994; Piore and Sabel 1984; Langlois and Robertson 1995; Sturgeon 2002). Those patterns recognised as particularly successful were codified into *models* of industrial organisation (Humphrey 1995).

Research did not stop at codifying established practices into models but went on to analyse how such models were applied in practice. While a model essentially defines the key elements of successful experiences, “the experiences upon which the model is constructed continue to change” (Humphrey 1995: 151). Moreover, when models are transferred, the contexts in which they operate often differ markedly from those upon which the experiences were based.

The existing body of research has looked into how models evolved over time in the country of origin in response to changes in external economic conditions, technological change, or competitive pressure (Lecler 1999, 2004; Lamming 2000; McCormick 2004; Sturgeon 2007), and how models transferred to different contexts have gone through processes of hybridisation, adaptation, or localisation (Cusumano and Takeishi 1991; Helper and Sako 1995; Guiheux and Lecler 2000). Very often the result was “neither a copy of the original model nor a replica of existing local patterns, but something different” (Westney 1999: 387). The varieties of country and industry experiences analysed in the literature clearly demonstrate the importance of going beyond models to analyse the trajectories of diffusion and adaptation (Humphrey 1995). However, although the importance of analysing trajectories is widely acknowledged, this has rarely been done systematically.

First, few previous studies have illuminated the actual *processes* by which organisations change. What they have done is either to compare the status of an organisation at a given point in time in a given setting – often after successful transformation has been completed – with the defining features of the original model; or to compare prevailing practices among different groups of companies, for example, firms of different nationalities located in a certain country or firms of the same nationality but located in different countries (Cusumano and Takeishi 1991; Sako 1992; Helper and Sako 1995).

As a result, the actual processes of organisational diffusion and adaptation, which is where insights relevant for firms and policy makers originate (Humphery 1995), remain largely underexplored. With what timing and in what sequence do key features of the model change? What tensions and challenges do organisations face in the process, and how do they overcome them? Very little of the existing literature examines these issues.

Second, there have been limited attempts to systematically explain *why* organisations evolve in the way they do. On the basis of the existing literature, there seems to be a broad consensus that the driver of organisational change typically comes from a lack of fit between the elements of organisation and the environment (Westney 1999). The problem with such a line of argument is that there has been no incisive debate on what precisely is meant by the 'environment'.

Existing empirical research mainly refers to the following three dimensions of the environment: (1) local market conditions, for example, producer competition and consumer preferences (Helper 1991; Lecler 1999, 2004; Humphery 2000; Sturgeon and Van Biesebroeck 2010); (2) competence levels and the existence or absence of a local component supply base (Sadler 1994); and (3) institutional factors such as legal and regulatory environments, capital markets, employment systems, culture, and social and moral norms (Dore 1983; Sako 1992).

However, given the lack of a systematic attempt to deconstruct the concept of the environment into a series of concrete, operational variables, we still do not know which factors are most important, how they interact with each other, or how they shape the processes of organisational change. Unless these questions are tackled, research can hardly be expected to pin down the fundamental factors that trigger (or impede) the transformation of industrial organisation. Thus, the mechanisms by which variables interact in shaping the processes of organisational transformation remain underexplored.

The above two research gaps seem to stem at least in part from the lack of an appropriate theoretical framework for categorising the various forms of inter-firm organisation or explaining the circumstances under which they emerge in terms of a series of concrete, operational variables. Recent theoretical development in the field of GVC governance has made important contributions in this regard. This paper adopts the revised version of the GVC governance framework for conducting systematic analysis of trajectories of organisational change.

2.2 Japanese and Chinese Models of Industrial Organisation in the Motorcycle Industry

In studying industrial organisation, particularly illuminating are the industries in which contrasting models of industrial organisation coexist because interactions between different models often create new dynamics of organisational transformation.[35] With

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[35] This seems to explain why the car industry, in which contrasting models of industrial organisation

the long dominance of the Japanese model and the rise of a new organisational model emerging from China, the motorcycle manufacturing sector became an example of such industries (Paper I).

The Japanese model of industrial organisation was developed out of the need to effectively achieve incremental product and process improvements in a proprietary product. Since motorcycles had an integral product architecture, lead firms took the lead in fine-tuning component designs and providing a quality guarantee to their consumers for the product system as a whole (Otahara 2009a, 2009b). Accordingly, they adopted a combination of centralised control and generous assistance in governing long-term relations with a fixed group of suppliers, which were expected to endeavour to achieve performance targets set by the lead firms, often by ceding autonomy (Paper I).

As Japanese manufacturers started to set up overseas production bases from the 1960s onwards, the organisational model established in Japan was replicated abroad. Lead firms sought to develop long-term relations with local suppliers. Where the local component supply base was lacking, this entailed provision of technical assistance to the suppliers.[36]

Compared to the long-established prominence of the Japanese model, the rise of its Chinese counterpart is a recent phenomenon. This model emerged in the early 1990s, driven by a large number of indigenous motorcycle manufacturers producing low-priced imitations of Japanese models. Contingent on de facto standardisation of a few dozen popular Japanese models, large numbers of assemblers and suppliers, both of whom were equipped with limited levels of technological competence, engaged in

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have emerged in the US and Japan, has been studied so widely.

[36] This occurred not only in developing countries such as Thailand (Higashi 2006) and Indonesia (Thee 1997; Sato 2011) but also in developed countries such as Italy (Horiuchi 1998).

arm’s-length transactions. With its strength lying in low costs and flexibility, the arm’s-length organisational model enabled Chinese motorcycle manufacturers to capture the lion’s share of the huge yet volatile domestic market where consumers put priority on low prices and intellectual property rights are only weakly protected.

The above summary of the existing literature suggests that we now know that the Japanese model of industrial organisation rose to prominence in the 1980s, and that it was transferred to both developed and developing countries – with manufacturers taking the lead in nurturing the pool of competent component suppliers demanded by this model. We also know that a second discrete model emerged in China. However, we know less about what is emerging out of the rivalry between the two models. Which model is superior? Which is more adaptable to third-country conditions; especially in the developing world, where the bulk of global motorcycle sales are concentrated (Fujita 2007)?

Such an overarching enquiry can be deconstructed into a series of more specific questions. In terms of the Japanese model, the key question is whether it can meet the Chinese challenge. Whilst the Japanese model has exhibited extraordinary strength in catering to sophisticated customers in the developed world, can it be adapted to compete with the Chinese model in developing country markets? With regard to the Chinese model, there has thus far been no attempt to study whether it can be successfully transferred. What changes are required if it is to work in different contexts? This paper attempts to answer these questions.

2.3 The Dynamics of Organisational Adaptation: The Vietnamese Motorcycle Industry

The Vietnamese motorcycle industry provides an excellent case through which to address the research gaps identified above. Vietnam was the first locality – after China itself – in which the Japanese and Chinese models clashed head-on. Because Vietnam is a new context for both models, neither has an advantage over the other; both must adapt to local Vietnamese conditions and fight for supremacy in this emerging market.

On the basis of the existing research on the Vietnamese motorcycle industry (Fujita 2005, 2006, 2007, 2011, 2012; Intarakumnerd and Fujita 2008, 2009; Pham Truong Hoang and Shusa 2006; Pham Truong Hoang 2007; Nguyen Duc Tiep 2006, 2007; The Motorbike Joint Working Group 2007), its development process can be broadly divided into three stages (Table II-1). In Stage I (mid-1990s to the end of the decade), only 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 (Fujita 2006). 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 (Figure II-1). This small, protected market hardly attracted any scholarly attention at this stage.

It was during Stage II (2000–2004) 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 (hereafter referred to as ‘local assemblers’). 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 Japanese firms. The market expanded four-fold in the late 1990s, and local assemblers of Chinese motorcycles commanded roughly 80% of these extended sales (Figure II-1).

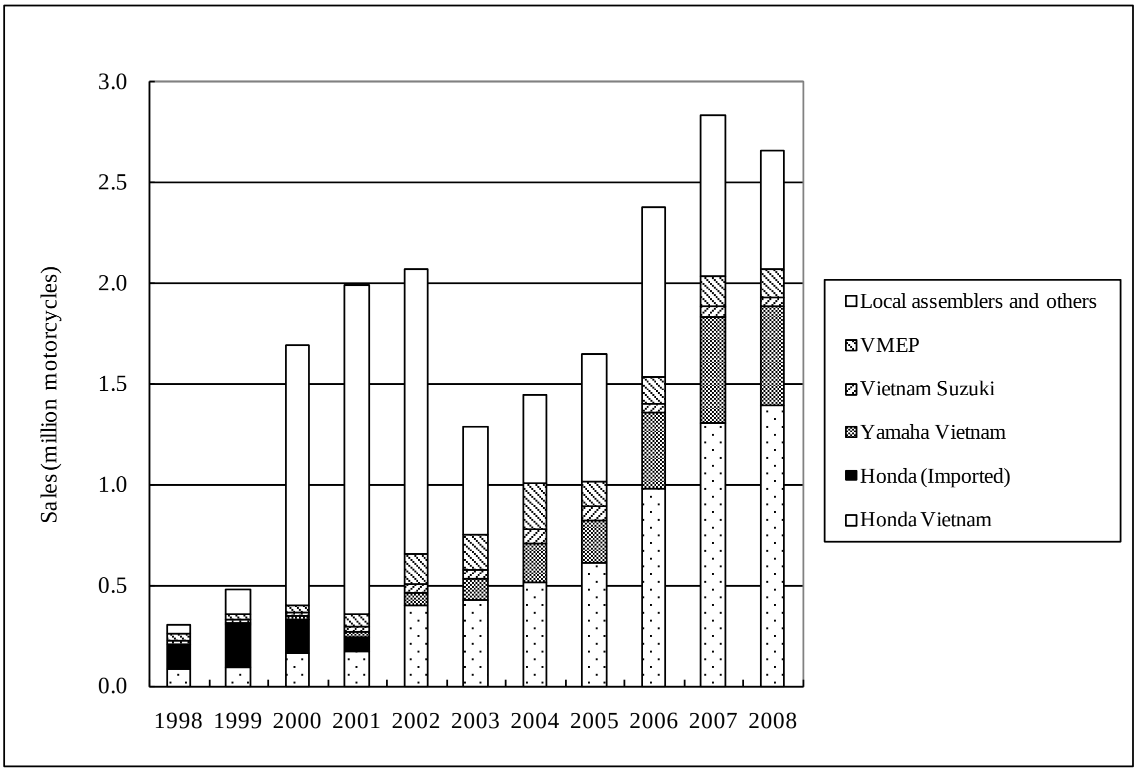
Table II-1. Stages of Vietnamese Motorcycle Industrial Development

Stage	Market (units sold per year)	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)	Over 2 million (2000–2001); reduced to 1.5 million (2002–2004)	(From 2002 onwards) Strengthened enforcement of import controls and local content rules; restrictions on motorcycle registration and expansion of production capacity by foreign manufacturers.	Lost market shares (2000–2001); Honda Vietnam launches a low- priced model in 2002, recovering market share.	Emergence of more than 50 local assemblers
Stage III: FDI-led development (2005–2008)	Over 2.5 million	Deregulation (local content rules, restrictions on motorcycle registration and capacity expansion abolished)	Fully recovered market share; increased FDI in component manufacturing	Consolidated into a smaller number of large assemblers

Source: Fujita (2012: 114).

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

Figure II-1. Motorcycle Sales in Vietnam by Manufacturers



Notes:

(1) VMEP (Vietnam Manufacturing and Export Processing Co., Ltd.) is a 100% invested subsidiary of Taiwan's Sanyang Motors.

(2) 'Local assemblers and others' include imported motorcycles that are not enumerated under imported Honda-brand motorcycles (available only until 2005) and foreign-invested motorcycle manufacturers that are not independently enumerated (including Lifan Vietnam, a Chinese-invested firm). However, the former has amounted to only 45,700 units as of 2005, while the latter has accounted for a relatively minor share in the domestic motorcycle market (The Motorbike Joint Working Group 2007: 27, 33).

Source: Fujita (2012: 115).

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[37] and limits on investments in expansion of production capacity by foreign motorcycle manufacturers[38] from 2003. 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 less than 1.5 million in 2003–4 (Figure II-1).

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,[39] 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.[40]

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 favourable allocation of import quotas, whilst insufficient quota allocation to HVN and

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[37] 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.

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

[39] 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). Its full implementation was delayed until the beginning of 2001 due to opposition from local assemblers (Ishida 2001).

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

Yamaha Vietnam (YVN) even drove these companies to temporarily suspend their production.[41] From 2003 onwards, as noted above, the government restricted foreign motorcycle manufacturers from investing in the expansion of production capacity beyond the original proposals granted by the Vietnamese authorities upon the issue of FDI licences. This turned out to be damaging to foreign motorcycle manufacturers because the rapid expansion of the market in the 2000s had not been envisaged in the 1990s. 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[42] together with the policy that had prevented foreign motorcycle manufacturers from investing in additional production capacity.[43] As a result, domestic motorcycle sales climbed to 2.8 million units in 2007, far exceeding figures during the China shock (Figure II-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 in countries with large demands for their products.[44] Accordingly, they actively invested

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[41] 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 (Cohen 2002).

[42] 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.

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

[44] 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).

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 sales as of 2006 (Figure II-1); surviving by catering to low-income consumers in the rural areas where Japanese-brand models had still not penetrated.

Of the three stages of development, the existing literature on industrial organisation focuses almost exclusively on Stage II, the period immediately following the China shock. Previous studies have emphasised the major changes that both HVN and local assemblers implemented to their sourcing practices immediately after the initial clash. Pham Truong Hoang (2007), Mishima (2007), and Otahara (2009a) all argue that HVN responded to the China shock by significantly diversifying its component sources to include non-Japanese suppliers in Vietnam and even local suppliers in China. Pham Truong Hoang (2007) also analyses the manner in which local assemblers responded to policies requiring local sourcing and investment in in-house manufacturing of components. On the basis of case studies of four assemblers, he argues that they shifted away from arm's-length supply systems towards those based on long-term, trust-based relations with suppliers.[45]

Nevertheless, the above discussion on the stages of Vietnamese motorcycle industrial development suggests that analysing the short-term impact of the China shock may not be sufficient for an understanding of the dynamics of the competitive adaptation of the two models. First, the existing literature acknowledges that the reactions of HVN and local Vietnamese assemblers were devised as emergency measures to cope with the

[45] The four case studies nevertheless indicate varieties of ways in which local assemblers responded to market and policy challenges: maintaining arm's-length linkages, vertically integrating component manufacturing, and spurring cooperative relationships with suppliers (Pham Truong Hoang 2007). However, the author does not discuss which of these patterns is dominant, a shortcoming that is probably due to a failure to provide the reasons as to why the four assemblers were selected in the first place. In any case, this research did not include the two assemblers that the present study refers to as A1 and A3 – firms it found to be increasingly dominant in Stage III.

immediate competitive threat (to HVN) and policy requirements (for local assemblers). It remains to be seen whether these adaptations prove to be sustainable in the longer term.

Second, the period immediately following the China shock was one of policy turbulence. Such a distorted and arbitrary legislative environment hardly enabled firms to implement long-term, sustainable adaptations to their sourcing practices. Given that the period of turmoil was immediately followed by a more stable phase (Stage III), it is essential that an analysis of industrial organisation in the Vietnamese motorcycle industry should be extended to cover this period. However, no previous studies have done this.

The temporal aspect of observation also raises the question of what factors cause industrial organisation to evolve. Virtually all of the previous studies cited above assume, explicitly or implicitly, organisational patterns are determined by that lead firms depending on the characteristics of the products they produce – whether design architecture, prices, or quality levels. Accordingly, their focus has been exclusively on the lead firms, whilst suppliers – the other key actor in the value chains – have been left out of the analyses.

In Japanese chains, it was the need for radical cost reduction that compelled HVN’s adjustment to sourcing practices (Mishima 2007; Otahara 2009a). In respect of local assemblers, the need to raise product quality and policy requirements eventually led some assemblers to invest in in-house production of components and/or to adopt long-term, trust-based relations with their suppliers (Pham Truong Hoang 2007).

Owing to its almost exclusive focus on product characteristics, research has hitherto overlooked the very essence of industrial organisation, that is, power relations between firms, which in turn are determined by the nature and levels of capabilities possessed by the respective parties (Sturgeon 2008; Palpacuer 2000; Humphrey and Schmitz 2008). A lead firm has the capacity to enforce particular types and levels of requirement on suppliers. However, such capacity has its limits because some suppliers may acquire power as they accumulate new competencies that are difficult to replace or explore new customers (Schmitz 2004; Sturgeon 2008). The relative power relations of lead firms and suppliers are central to research on the dynamics of industrial organisation but no previous studies have analysed them.

2.4 Research Questions and Hypotheses

In view of the research gaps identified above, this paper will examine the evolutionary dynamics of the Japanese and Chinese models of industrial organisation in the Vietnamese motorcycle industry. It addresses the following overarching research question:

> *How has the competition between Japanese and Chinese organisational models affected the organisational transformation of the Vietnamese motorcycle industry?*

For the purpose of analysis, this question is divided into two sub-questions.

<u>Sub-question 1</u>: *How did the Japanese and Chinese organisational models evolve in Vietnam?*

The literature suggests that the two models converged within a few years of their direct clash, as Japanese motorcycle manufacturers expanded their component sources to include non-conventional sources for the purpose of spurring competition between suppliers, and local assemblers developed long-term, trust-based relations with their suppliers.

Hypothesis: *The two models converged within a few years of their initial clash in Vietnam.*

The second sub-question is concerned with explaining the organisational transformation that eventually occurred.

Sub-question 2: *What factors drove the organisational transformation of the Vietnamese motorcycle industry?*

Existing empirical research emphasises that *the nature of the products*, which the lead firms adjust in order to cope with competitive pressure, is the key variable in explaining the dynamics of an organisational model.

Hypothesis: *Organisational transformation is explained primarily by product characteristics determined by the lead firm.*

3. Conceptual Framework and Operationalisation of Key Concepts

For the purpose of analysing the dynamics of organisational transformation in the Vietnamese motorcycle industry, this paper adopts the revised version of Gereffi et al.'s (2005) framework of GVC governance presented in Section 2, Paper I, in which value chain governance is explained in terms of two operational variables: the nature of product and process parameters exchanged in transactions and the alignment of relevant capabilities within the industry. For the purpose of empirical analysis, indicators have been developed for the key concepts (Table II-2). Given the lack of quantifiable indicators for key variables, the analysis of trajectories focuses primarily on the *direction* of change in the status of the key variables over time, for example, an increase or decrease in the degree of complexity of product parameters.

Table II-2. Operationalisation of Concepts

(a) Determinants of Governance Types

Key Concepts		Indicators
Nature of Product/ Process Parameters	Level of Complexity	General product characteristics (e.g. price levels) The way in which the lead firm specifies product/process requirements to suppliers
	Level of Standardisation	General product features (e.g., whether product designs are proprietary or standardised) The way in which the lead firms specifies product/process requirements to suppliers
Structure of Relevant Capabilities within the Industry	Lead Firm Capability	Whether or not the lead firm engages in key functions, e.g. product development, marketing, and production of core components The scale of orders placed to suppliers The capacity to switch suppliers
	Supplier Capability	Changes in the number of suppliers, and types and levels of capability possessed (For new suppliers) Suppliers' experience prior to entry into respective value chains

(b) Governance Types

	Pattern of Dependence	Coordinating Mechanism
Types of Data Required	Lead firm: availability of alternative sources of components Suppliers: number of customers; percentage of sales to respective lead firms; size of orders	Mechanisms used to communicate product/process parameters and ensure that they are met
Markets	Neither side is dependent on the other	Limited communication of information beyond price levels
Modular		Communication of complex parameters without intense interaction enabled by industry-wide standards
Relational	Mutual interdependence	Intense two-way exchange of information
Captive	Small suppliers dependent on a large lead firm	Lead firm takes the lead in sharing of long- and short-term targets; performance monitoring; regular sharing of information on products and processes; provision of technical/financial assistance
Hierarchy	Vertically integrated corporation	Firm's internal command

Source: The author, with reference to Palpacuer (2000), Schmitz (2006), Sturgeon (2008), Kaplinsky and Morris (2000), and Sako (1992).

The indicators of supplier capability require further explanation. Drawing on the technological capability (TC) literature (Lall 1992; Bell and Pavitt 1995), this study focuses on the *type and level of capability* possessed by suppliers. With regard to type, reflecting the capability requirements that the Japanese and Chinese organisational models impose on suppliers, the key distinction is between *new product introduction* (product development and design) and *production*. The latter is further divided into the equipment-related and production management dimensions (Sato and Fujita 2009). In terms of level, the focus will be on whether suppliers starting at routine operation for the domestic market (*operational* level) can progress to the level at which they are able to maintain stable and continuous operations that fulfil the requirements of foreign customers (*assimilative* level), and further to level at which suppliers are able to make minor yet original improvement to the existing products or production activities (*adaptive level*) (ibid.).

4. Methodology

This section explains the methodology adopted in the empirical research project, that is, the retrospective case study method, criteria for selection of cases, and methods of data collection and analysis.

4.1 Research Design: Retrospective Case Study

In order to analyse the decade-long dynamics of change in industrial organisation, this paper adopts the retrospective case study method (de Vaus 2001; Glick et al. 1995; Tuma and Hannan 1984). In the present context, this method involves tracing the processes of organisational transformation by observing the sequence of historical events occurring in specific sets of value chains with several intervals. Table II-3 provides a summary of the overall case study design. In an attempt to illuminate how and why the Japanese and Chinese models of industrial organisation were transformed in the Vietnamese context over time, this study analyses two sets of value chains representative of the Japanese and Chinese models in Vietnam respectively. Each of them are analysed by means of an embedded case study design, which combines the analysis of the overall context with that of embedded subunits (Yin 2003). In accordance with the conceptual framework presented in the previous section, the focus is on the lead firm(s) and its/their main first-tier suppliers.

Table II-3. Case Study Design

	Japanese Model	Chinese Model
Cases	HVN chains	Vietnamese–Chinese chains as a whole
Case Study Design	Embedded case study design Analysis of context: Analysis of HVN value chains as a whole Analysis of embedded subunits: HVN as the lead firm, and major Japanese (*keiretsu* and non-*keiretsu*) and Vietnamese suppliers	Embedded case study design Analysis of context: Analysis of the local motorcycle assembly industry as a whole Analysis of embedded subunits: (Stage II) Four major lead firms (Assemblers A1, A2, A4, and A5) and their Vietnamese, Taiwanese, and Korean suppliers (Stage III) Five major lead firms (Assemblers A1, A3, A4, A5, A6) and their Vietnamese, Chinese, Taiwanese and Korean suppliers
Data Sources	Context: interviews with Honda's various units in Vietnam, Thailand and Japan; published and unpublished statistics; company website Embedded cases: interviews, factory visits, company websites, reports, newspapers	Context: published and unpublished Vietnamese government statistics; reports; newspapers Embedded cases: interviews, factory visits, questionnaire surveys, company websites

Source: The author.

The transplanted Japanese model is represented by value chains independently developed and governed by HVN for the following reasons. First, HVN remained the single most important motorcycle manufacturer in the Vietnamese motorcycle industry throughout the period of investigation (Figure II-1). Second, among Japanese motorcycle manufacturers in Vietnam, HVN was the hardest hit by the China shock but also reacted with the most fundamental adjustments. By contrast, YVN's consistent focus on the high-end market limited direct Chinese competition (Fujita 2005); and Vietnam Suzuki (VNS)'s market shares were too small for the China shock to have an observable impact (Figure II-1).

The case study of HVN's value chain combined investigation of the overall context and that of embedded subunits including HVN as the lead firm, and major Japanese and Vietnamese suppliers. A total of 11 Japanese and 10 Vietnamese suppliers were purposefully selected as embedded subunits on the basis of the following criteria. First, cases were limited to suppliers of components that usually had model-specific designs, which, therefore, required close coordination between lead firms and suppliers. These included suppliers of metal and plastic components, dies, and moulds. Second, for the purpose of highlighting structural changes within the chains, cases were selected based on the requisite level of diversity: *keiretsu* and non-*keiretsu* suppliers among Japanese suppliers; state-owned and private companies among Vietnamese suppliers; and suppliers that had joined HVN value chains at various stages of industrial development. Third, an attempt was made to ensure that a sufficiently large number of cases were covered. The study ultimately selected 10 out of a total of 18 Vietnamese suppliers and 11 out of a total of 26 Japanese suppliers operating in HVN's value chain as of 2007.[46]

The Chinese model is represented by Vietnamese–Chinese chains developed by local Vietnamese motorcycle assemblers.[47] Unlike the analysis of the Japanese model, the focus is not limited to those value chains developed by specific lead firm(s) because their small size, repeated entry into and exit from the market, and the emergence of a

[46] These include Vietnamese suppliers V1-9 and V13 and Japanese suppliers J1-11.
[47] Lifan Vietnam, the only Chinese-invested motorcycle manufacturer, was not selected on account of its small market shares and its focus on engine production rather than motorcycle assembly (The Motorbike Joint Working Group 2007: 27).

shared supply base serving the local motorcycle assembly industry at large (see Section 6.2) calls for coverage of Vietnamese–Chinese chains as a whole.[48]

Analysis of the Chinese model also combines that of context and embedded subunits. The former relies on analysis of the local motorcycle assembly industry as a whole. In respect of the latter, six local assemblers were selected from lists of those operating as of 2000 and 2006 respectively[49] according to the following criteria. The first one was the *critical case* criterion, in which priority was given to assemblers that were sufficiently large in terms of the scale of production.

Second, selection was based on two types of replication logic in case study research: literal replication (predicting similar results across cases) and theoretical replication (predicting contrasting results but for predictable reasons) (Yin 2003). Since assemblers' product strategies and performance started to diverge at a late stage of industrial development, cases were selected to include assemblers adopting different product strategies and sourcing practices. On the basis of the author's previous research (Fujita 2006), the key distinction was between one group of assemblers that concentrated on the production of low-priced imitations of Japanese-brand motorcycles, and another group that prioritised quality improvement, and the development of own designs and brand names often at the expense of higher prices.

Third, cases were selected so as to make use of data obtained from the author's previous fieldwork, and accessibility to assemblers for additional rounds of fieldwork. Since data

[48] The distinction between Japanese and Vietnamese–Chinese chains is similar to the contrast drawn by Sturgeon and Lee (2005: 35) in reference to supplier networks in the automotive sector whereby Toyota's supplier network competes with that of General Motors' and the electronics industry, in which strategic outsourcing by groups of lead firms has led to the rise of a shared supply network. A striking feature of the present case is that contrasting supplier networks have emerged within a single industry.

[49] The 2000 list was provided by the Vietnamese Ministry of Industry, and the 2006 list was provided by the General Statistics Office.

from previous fieldwork only included information on three assemblers (A1, A4 and A5), attempts were made to incorporate additional embedded case assemblers that were known to have played major roles in stages II and III. Assembler A2, which in 2000 had had the largest turnover of 51 local assemblers,[50] and assemblers A3 and A6, which were found to be expanding sales in Stage III, were added as embedded cases.

As a result of the selection process, the author ended up with six assemblers (A1-6) as embedded subunits. Assemblers A1, A2 and A3 belonged to one category of assemblers concentrating on the production of low-priced imitations of Japanese-brand motorcycles. Assemblers A5 and A6 were typical examples of the other category of assemblers prioritising the development of own designs and brand names and quality improvement. Assembler A4 fell somewhere in between the two categories.

Suppliers were also analysed as embedded subunits in the Vietnamese–Chinese chain. Data were obtained for a total of 24 suppliers of different nationalities (5 Chinese, 7 Taiwanese, 1 Korean, and 11 Vietnamese).[51] Attempts were made to ensure that cases included suppliers playing key roles in value chains developed by both of the aforementioned emergent groups of assemblers.

4.2 Data Collection and Analysis

In an attempt to analyse the trajectories of organisational transformation over the decade from the late 1990s, this study combined three main sources of data. The first dataset derived from the author’s previous fieldwork conducted in 2001, 2002, 2003, 2004 and 2005. Since the industry in question had undergone dramatic transformation involving

[50] Based on the list of local assemblers provided by the Vietnamese Ministry of Industry.
[51] These include Chinese suppliers C1-5, Taiwanese suppliers T1-7, Korean supplier K1 and Vietnamese suppliers V13-23.

many entries and exits, high staff turnover, and the frequent personnel changes typically observed in foreign affiliate, the present study would not have been possible without data from these previous rounds of fieldwork. Although they were driven by different research questions, they provided a great deal of information on lead firm production strategies and sourcing practices, lead firm–supplier relations, and the development of suppliers' capabilities.

Data obtained in previous rounds of fieldwork were compiled in the form of interview recordings, transcriptions, and notes (mainly from Vietnamese companies); interview notes (mainly from Japanese, Taiwanese, Korean, and Chinese companies); questionnaire surveys; notes taken during factory visits; company brochures and presentation materials; and other materials provided by firms. The present study therefore commenced with the interpretation and coding of existing materials in accordance with the operationalised indicators presented in Section 3.

Second, additional rounds of fieldwork were conducted specifically for the present study in order to collect data on new developments after 2005 and, wherever possible, to obtain retrospective data on earlier years. The basic strategy was to follow up with lead firms and suppliers approached in previous fieldwork, but attempts were also made to incorporate those that had not been included in the earlier studies but had come to play important roles in Stage III.[52] Additional interviews with HVN and local assemblers, as well as their key suppliers, were also conducted between 2007 and 2009.

The fieldwork study of local assemblers requires further explanation. A major challenge was the difficulty in accessing assemblers for additional rounds of fieldwork (A3, A4,

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[52] Examples include local assemblers A3 and A6, and suppliers J10, J11, C1, V7, V9, and V16. Information on newly-emerging companies was obtained from newspapers and interviews with firms and industry experts.

and A6 agreed to be interviewed whilst A1 and A5 refused). The challenges were addressed by the following measures. One was to conduct questionnaire surveys of local assemblers in collaboration with the Vietnam Institute of Economics, Vietnam Academy of Social Science in 2007, to which A1, A3, A4, A5 and A6 agreed. Another was to access a former employee. Since access could be made to the former procurement manager (2002–4) of assembler A2, a series of interviews was conducted to obtain information on the company in the early 2000s.

In order to complement limited amount and quality of data on local assemblers, the author also interviewed Taiwanese, Korean, Chinese and Vietnamese suppliers that had worked closely with these local assemblers over the years. The former transpired to be easier to access and became precious sources of information on Vietnamese–Chinese chains. Towards the last stage of the fieldwork, the author presented the main lines of argument on Vietnamese–Chinese chains to these suppliers and other industry experts and asked for their feedback. This exercise helped to confirm the validity of arguments and indicate where adjustment was necessary.

The third source of data was that on local supplier capability which was collected for a different part of this research project focussing on trajectories of supplier capability formation (Paper III). Of the 21 suppliers covered in Paper III, data for 18 of them were revealed to be suitable for the present study.[53] In-depth interviews were conducted with these 18 suppliers to identify the types and levels of capability acquired by such firms in Japanese and Vietnamese–Chinese chains at different stages of industrial development.

The full list of firms interviewed and surveyed and questionnaire forms are included in

[53] The remaining three were second-tier suppliers to Japanese motorcycle manufacturers, which were beyond the scope of this study.

Appendices 1 and 3 respectively. Interviews cited in this paper are referred to by firm and interview codes as explained in Appendix 1.

In addition to interviews and questionnaire surveys, this study also made use of the following additional data sources: published and unpublished statistics, Vietnamese and Japanese newspapers, reports and research papers on the industry, and presentations and lectures given by representatives of firms analysed as embedded cases.

All the fieldwork materials were coded and tabulated using the indicators presented in Section 3. The following sections will present the results of the analysis as a synthesis of insights obtained from various levels of analysis. While individual firm-level case reports had been prepared in the course of the analysis, the details of the individual cases will be included only where necessary.

5. The Emergence and Transformation of the Japanese Model in Vietnam

Sections 5 and 6 present the empirical analyses of the transformation of Japanese and Chinese organisational models respectively in Vietnam. Each is structured in chronological order, with subsections running from earlier to later stages of industrial development. Each subsection begins by discussing the features of the two determinants of industrial organisation – namely, the nature of the product and the alignment of relevant capabilities – in the respective value chain at each stage of industrial development. It then goes on to analyse the form of industrial organisation that emerged under the prevailing conditions.

Section 5 focuses specifically on how Honda, the leading global motorcycle manufacturer, transferred its conventional organisational model to Vietnam, and how it was transformed in the short- and the medium-term after its clash with the Chinese model. The discussion proceeds in the following order:

- Stage I: the industry's start-up phase, designed to observe the status of the transferred Japanese model before its clash with the emergent Chinese model
- Stage II: the period of the China shock and its repercussions, designed to observe the immediate response of actors in Japanese chains to the direct clash with the Chinese model
- Stage III: the period of FDI-led development, designed to observe the medium-term impact of the clash with the Chinese model and the situation after unstable policy conditions impeding organisational adjustments were cleared

5.1 Stage I: A 'Foster Parent' Variant Emerges

The empirical analysis of the Japanese model begins with the assessment of Honda's relations with its suppliers in the early years of its operation in Vietnam when the market was small and the local component supply base was underdeveloped. The following subsections examine how the company attempted to cope with the initial challenges and assess the key features of the emerging form of industrial organisation.

5.1.1 The Need for Explicit Coordination: Non-standard Designs and High Quality

Upon launching local production in Vietnam, Honda basically sought to replicate the conventional product strategy it had perfected in Japan and earlier overseas investment locations: 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.[54] One was adapted from an existing model produced in Thailand, and the other was developed exclusively for the Vietnamese market, carrying components customised to this particular model. The company also instituted its own component quality standards to be applied at its production bases in Asia.[55]

Not only were product/process parameters idiosyncratic, they were also complex. HVN's emphasis at this stage was clearly not on price competitiveness, the two models launched in the 1990s being priced as high as US$2,000.[56] This reflected not only high quality levels but also a lack of scale economies, dependence on imported components, and monopoly rents.[57] Unsurprisingly, sales stagnated as price levels were far above the reach of ordinary citizens; while the limited number of consumers who could afford the high prices opted for Honda-brand motorcycles imported from Thailand that were priced at broadly similar levels (Nguyen Tran Que and Hoa Huu Lan 1998). However, this did not lead HVN to adjust its product strategy at this stage.

HVN's emphasis on the non-price dimensions of competitiveness was confirmed by its suppliers. Detailed drawings provided by the company specified detailed product and process parameters (interviews with V1 #2, #4; V2 #1; V3 #1). As will be discussed in more detail below, none of the suppliers interviewed by the author were asked to reduce their prices at this stage.

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[54] This discussion of models launched in the1990s is based on an interview with HVN #2.
[55] *Nikkei Sangyo Shimbun (Nikkei Business Daily) Newspaper*, 25 May 1999.
[56] The prices were US$1,990 and US$2,044 respectively (Nguyen Duc Hien 2004: 234).
[57] A Vietnamese government inspection in 1998 found that HVN had earned profits of US$18,154,000 – or US$221 per vehicle sold (calculation by the author) – in the company's second full year of operation (Ha Huy Thanh et al. 2003: 332).

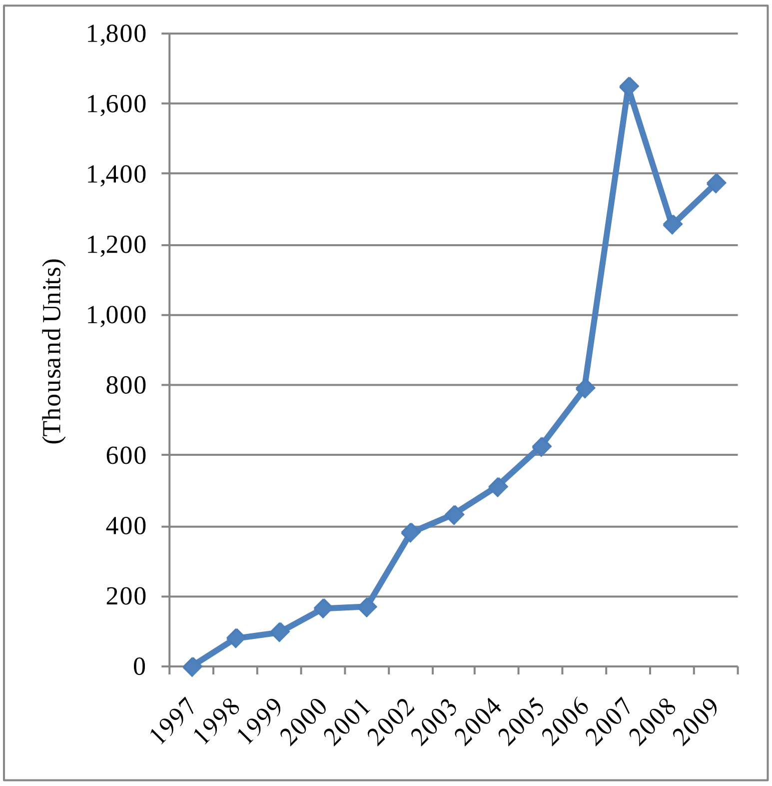
Apparently, Honda made limited effort to adapt its product strategy to the demands of Vietnamese consumers. After all, Vietnam was still a small, emerging market and the only major competitors were Honda-brand motorcycles imported from Thailand. Stagnating sales notwithstanding, the company was not compelled to seriously reconsider its product strategy.

5.1.2 Misaligned Capability/Power Structure

As one of the world's leading manufacturers of motorcycles since the 1960s, Honda enjoyed product and branding leadership that had remained unchallenged for decades. The company also controlled virtually all key value chain functions, including product development, designs of all components other than a limited number of core items, marketing, and branding (Paper I). As of the late 1990s, the company's operations in Vietnam focussed on production, while product development and design were undertaken in Japan.

Yet, even such product, technological and marketing leadership transpired to be insufficient for HVN to gain control over the Vietnamese market. As stated above, since its products were out of the reach of ordinary Vietnamese consumers, motorcycle sales stagnated in the 1990s (Figure II-1). The fact that it was the single largest motorcycle manufacturer in Vietnam notwithstanding, HVN's production in the 1990s remained small (Figure II-2); indeed, far lower than 300,000 units per year – the level generally recognised by Japanese manufacturers of motorcycle components as the minimum scale needed for efficient production (Mishima 2007).

Figure II-2. HVN's Annual Motorcycle Production



Source: Honda Motor Co., Ltd. (various years).

The Vietnamese government demanded that foreign motorcycle manufacturers expand local sourcing of components.[58] To meet this requirement, Honda adopted its conventional approach of sourcing from the following two types of suppliers (interview with HVN #1), both of which transpired to be in short supply in Vietnam. First, Japanese suppliers – especially members of the Honda Group (*keiretsu*) – were preferred because of their proven record of manufacturing competence in serving Honda in Japan and abroad. However, despite indications that Honda explicitly or implicitly asked *keiretsu* suppliers to establish production bases in Vietnam notwithstanding (interviews with J6 #1; J7 #1), few of them did so because the country was still regarded as risky investment location (JETRO 1996; Ichikawa 2001) and the anticipated size of orders was too small.

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[58] Circular of the State Committee for Cooperation and Investment 1536/UB-VP dated 11August 1994.

Second, Honda also sought to mobilise relatively large, well-established local companies. However, given the underdeveloped status of Vietnam's mechanical industries at this stage,[59] only four such firms were initially admitted into HVN's value chain (Table II-4). Even though they were relatively large and well-established by Vietnamese standards, none of them had previous experience of manufacturing machinery components or serving foreign customers. This is evident from Table II-5, which shows production capabilities possessed by Vietnamese suppliers in Japanese chains including three of the four suppliers that were admitted into HVN's chains in the 1990s (V1, V2 and V3).

Table II-4. 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

Note: VEAM (Vietnam Engine and Agricultural Machinery Corporation) is a state-owned business group that contributes 30% capital to HVN.
Source: The author's 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).

Consequently, HVN's value chain remained underdeveloped. As of 1998, the local content ratio was only approximately 44% (Table II-4), which included components that HVN manufactured in-house, the majority of parts being necessarily imported, mainly

[59] This is evident from remarks made by experts who visited local Vietnamese companies engaged in processing metal, plastic and rubber products in 1995. Having visited nine major local companies, they 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).

from Japan. In 1998, HVN's supply networks in Vietnam only consisted of 16 first-tier suppliers: 12 Japanese companies, 5 of which belonged to the Honda Group,[60] and 4 local firms.

Table II-5. Production-related Capabilities Acquired by Vietnamese Suppliers in Japanese Chains

	Before Stage I	Stage I	Stage II	Stage III
V1	Production of household plastic items	Operational	(n/a)	Adaptive
V2	Production of bicycle components	Operational	Operational - assimilative	Assimilative-adaptive
V3	Production of household metal items	Operational	Operational	Assimilative
V5	Production of household plastic items		Operational	Operational-assimilative
V6	Production of wire harnesses for export to Japan		Assimilative	Adaptive
V7	Production of machinery components for SOEs		Operational	Assimilative
V8	(not yet established)			Assimilative
V9	Production of machinery components for SOEs			Operational
V13	Production of machinery components for SOEs		Operational	Assimilative

Notes:
(1) n/a = data not available.
(2) For the period prior to entry into a Japanese chain (the unshaded area), main lines of business are shown.
(3) For the period after entry into a Japanese chain (the shaded area), the level of equipment-related and production management capabilities acquired by each supplier is shown. In case levels of the two types of capabilities differed, the lowest and highest levels.
Source: The author's interviews with suppliers, compiled based on Paper III.

In short, Honda's global leadership in product, technology and branding notwithstanding, the company had yet to establish sufficient market power to exert control over the albeit limited number of suppliers that possessed low levels of manufacturing competence.

5.1.3 The Lead Firm as a Generous Provider of Assistance

Limited lead firm control over the market combined with Vietnam's dearth of

[60] Suppliers J2, J6 and J10 even enjoyed direct capital investment from Honda's Thai affiliate.

component suppliers to constrain HVN in its attempts to exercise dominance. The result was a ‘foster parent’ variant of the captive model, whereby the lead firm relied primarily on the assurance of long-term orders, and the provision of technical and financial assistance to induce the suppliers’ commitment to meet its requirements.

The key features of the emerging organisational model are evident from the pattern of lead firm–supplier dependence. On the one hand, the need to increase local contents in accordance with government requirements, combined with the difficulty of finding alternative domestic sources of components, meant that HVN was dependent to a great extent on its incumbent suppliers. Given non-standard product parameters and demand below the minimum level required for efficient production, orders were commissioned straight to a fixed group of suppliers.

On the other hand, supplier dependence on HVN varied (Table II-6). Even with modest orders, Japanese suppliers were largely dependent on HVN as they had no other major customers. This was particularly the case with regard to members of Honda Group, who invested in Vietnam specifically with the aim of doing business with Honda.[61] By contrast, local Vietnamese suppliers typically maintained the output of their traditional products. This was the practice of all of four Vietnamese suppliers interviewed by the author that entered the HVN value chain in the 1990s; while business with HVN accounted for a relatively minor proportion of their sales (Table II-6).

As stated above, in order to induce suppliers’ commitment to achieve its targets, HVN played the role of a ‘foster parent’ – a generous provider of assistance. The company’s extensive use of assistance at this stage is evident from the author’s interviews with

[61] Three of the four Honda Group suppliers interviewed by the author explicitly mentioned that they invested in Vietnam with the aim of serving Honda (interviews with J2 #1, #2; J6 #1; J7 #1). No information was available on the remaining supplier (J3).

Table II-6. Suppliers' Dependence on HVN

(a) Japanese Suppliers

Name	Honda Group	Start of Trans-actions	Components	Ranking by Turnover		Dependence on HVN and Changes in the Volume/Content of Orders		
				2002	2006	Stage I	Stage II	Stage III
J1	*	1997	Steel/ aluminium components	2nd	(reorganised into J10)	100% dependent on HVN.	100% dependent on HVN. Orders for increased variety of components and types of processing required.	(Reorganised into supplier J10 in 2005.)
J2	*	1997	Silencers	3rd	3th	100% dependent on HVN.	100% dependent on HVN and its suppliers. Orders for increased variety of components.	100% dependent on HVN and its suppliers. Further increase in variety of components.
J3	*	1997	Brake system	7th	7th	Highly dependent on HVN.	Highly dependent on HVN but started exporting components to Japan.	Dependent on HVN for 52% of sales while exports increased to 23%. Increased orders for sophisticated components from HVN.
J4		1997	Dies and moulds	(not included)	(bankrupt in 2004)	(n/a)	Highly dependent on HVN but traded with VNS, YVN and manufacturers of consumer electronic products.	(Bankrupt in 2004.)
J5		1997	Plastic components	(not included)	(not included)	(n/a)	Dependent on HVN for 40% of sales but traded with YVN and consumer electronics manufacturers.	Dependence on HVN decreased to 20%. Increased production of electronic components.
J6	*	1998	Shock absorbers	4th	1st	Almost completely dependent on HVN	Highly dependent on HVN but also supplied limited quantities to YVN and VNS. Lost orders for certain types of components upon the launch of the Wave Alpha but recovered them within a few years.	Dependent on Honda for 95% of sales (including HVN for 85% and exports for 10%). Orders for increased variety of components.
J7	*	1998	Electronic components	5th	2nd	(n/a)	Dependent on HVN for 65% of sales.	(n/a)
J8		1998	Plastic components	(not included)	(not included)	Many customers in other industries	Many customers in electronics and other industries.	(n/a)

Table II-6. Continued

Name	Honda Group	Start of Trans-actions	Components	Ranking by turnover		Dependence on HVN		
				2002	2006	Stage I	Stage II	Stage III
J9		2001	Aluminium components	(not included)	(not included)	(n/a)	(n/a)	90% of sales in 2006 from motorcycle components, including supply to HVN and YVN. Volume and variety of orders from HVN reduced by 2008.
J10	*	2004	Steel/ aluminium components	(not yet established)	4th	(not yet established)	100% dependent on HVN and its suppliers.	100% dependent on HVN and its suppliers.
J11	*	2005	Transmission	(not yet established)	35th	(not yet established)	(not yet established)	100% dependent on HVN and its suppliers.

(b) Vietnamese Suppliers

Name	VEAM Member	Start of Trans-actions	Components	Ranking by Turnover		Dependence on HVN and Changes in the Volume/Content of Orders	
				2002	2006	Stages I to II	Stage III
V1		1997	Plastic components and moulds	(not included)	(not included)	Dependence on HVN increased from 16% in 2001 to 41% in 2002.	Dependent on HVN for 40% of sales in 2008. Orders for high-precision components and moulds since 2006. Orders from buyers in other industries also increased.
V2		1997	Metal components	(not included)	13th	Dependence on motorcycle components increased from 22% in 1998 to 85% in 2003 (mostly HVN).	Dependent on motorcycle components for 87% of sales in 2008. Increased volume and variety of orders from HVN and its suppliers.
V3		1997	Metal components	12th	(not included)	Dependent on motorcycle components for 60% of sales in 2001 (mostly HVN).	Dependent on HVN for 50–60% of sales. Volume of orders increased but concentrated on components requiring relatively simple processing.
V4		1997	Metal stamped components	(not included)	(not included)	Dependence on HVN increased from 30–40% in the 1990s to 70% in 2002. Volume and variety of orders increased.	Dependence on HVN reduced to 40–45% in 2008. Volume and variety of orders not increased while supplier expanded transactions in other products.
V5		2000	Plastic components	(not included)	(not included)	Dependent on motorcycle components for less than 10% of sales in 2002 (mostly HVN).	Dependence on HVN increased to 40% in 2007. Orders falling by 2008 and concentrated on components requiring relatively simple processing.

Table II-6. Continued

Name	VEAM Member	Start of Trans-actions	Components	Ranking by Turnover		Dependence on HVN and Changes in the Volume/Content of Orders	
				2002	2002	Stages I to II	Stage III
V6		2001	Wire harnesses	(not included)	(not included)	(n/a)	Dependent on HVN for 40% of sales in 2008. Volume and content of orders unchanged.
V7	*	2001	Metal engine components	(not included)	(not included)	Dependent on HVN for 42% of sales in 2002.	Dependent on HVN for 60% of sales in 2008. Orders increased, including processing for high-precision engine components.
V8		2004	Dies and moulds	(not included)	(not included)	(not yet established)	Dependent on HVN for virtually 100% of sales in 2008.
V9	*	2005	Metal engine components	(not included)	(not included)	(not yet started transactions with HVN)	Dependent on HVN for one-third of sales in 2008. Orders increased, including processing for high-precision engine components.
V13	*	2004	Metal components	(not included)	45th	(not yet started transactions with HVN)	Dependent on HVN for 80% of sales in 2008. Orders increased in volume and variety.

Notes:
(1) ‘Ranking by Turnover’ indicates placement of respective suppliers among all registered motorcycle component suppliers included in lists provided by the General Statistics Office.
(2) ‘Not included’ indicates that the supplier was omitted from the list, which typically occurred when suppliers were registered under other industries because their main product lines were not motorcycle components.
Source: The author’s interviews.

suppliers. For members of the Honda Group, patronage took the form of financial support. This was a means by which HVN could reward its suppliers for taking the risk of investing in the equipment and/or training required specifically for serving Honda; given that the company was unable to provide suppliers with what they most wanted: large and stable orders. Two of the four Honda Group suppliers interviewed (J2 and J3) pointed out that HVN had applied preferential prices for the first few years so that they could gain a quick return on their investments. As a result, supplier J3 recorded a profit as early as the second year of operation (interview #1), and supplier J2 completely eliminated its losses by the early 2000s (interview #2).

For local Vietnamese suppliers, patronage took the form of technical assistance. Without the provision of such help over an extended period, it was virtually impossible for local Vietnamese companies to meet HVN’s requirements. All of the four Vietnamese companies selected by HVN as first-tier suppliers upon the launch of its local production were interviewed by the author at different times. They had all received technical assistance, typically in the form of repeated visits of experts to their factories over a few years to provide advice and suggestions (interviews with suppliers V1 #1; V2 #1, #2; V3 #1, #2; V4 #1).

For its part, HVN made relatively limited use of its ability to impose demanding requirements on its suppliers – a key feature of the captive model. While HVN’s quality stipulations constituted a challenge to most local suppliers, they were given ample time to study procedures and strive to reach the requisite standards (interview with V2 #1). The small volume of orders also meant that delivery requirements were loose, a factor that is evident from the author’s interview with supplier J3, one of the Honda Group suppliers.

> In those days [the 1990s], when we could not make the delivery deadline specified by HVN, our local staff even requested them to adjust their production timetable. Now [at the time of the interview i.e. 2004] it is difficult to imagine that such a practice was going on. (J3 #1)

In summary, HVN's differentiated, proprietary products called for explicit governance mechanisms. Even though HVN remained the sole coordinator of its value chain, the limited volume of orders and an underdeveloped local component supply base constrained it in the establishment of its dominance in terms of imposing challenging targets on its suppliers. The outcome was that HVN adopted the role of a 'foster parent' in attempting to nurture the capabilities of its suppliers. Moreover, in the absence of major competitors, HVN was not compelled to reconsider its strategies at this stage.

5.2 Stage II: Partial Transformation of the 'Foster Parent' Variant

This subsection considers Honda's short-term response to the new challenges posed by the China shock. Faced with the need to spur price-based competitiveness, HVN sought to adjust its organisational model but such an attempt only produced limited progress at this stage. The following examines the factors that drove HVN's organisational adjustment as well as those that impeded it, and discusses the form of industrial organisation that emerged out of the adjustment.

5.2.1 Impetus for Transformation: Radical Price Reduction

The impetus for organisational change came from a radical shift in emphasis of HVN's product strategy from non-price to price-based competitiveness. When the Vietnamese market began to be flooded with massive numbers of low-priced imitation motorcycles, for the first time, Honda realised the huge unexploited demand at the bottom end of low-income markets like Vietnam. This led Honda to initiate a company-wide effort to develop a low-priced model in an attempt to prevent the entry of Chinese motorcycles into Southeast Asia, where the Japanese company had held market leadership for decades (Higashi 2006; Sato 2011). In collaboration with the R&D headquarters and mother factory in Japan and production base in Thailand, Honda's regional R&D base in Thailand developed a low-priced model with exceptional acceleration (Ohara et al. 2003; Ohara 2006b). Priced at approximately one-third of HVN's existing models,[62] the Wave Alpha was launched in Vietnam in January 2002.

The launch of this low-priced model had significant impact on parameters imposed on suppliers. On the one hand, the complexity of parameters was reduced. Price reduction targets demanded by HVN upon the launch of the Wave Alpha on four of the Honda Group suppliers of core components interviewed by the author ranged between 40% and 50% (Table II-7), which was far beyond the targets achieved by routine incremental improvements in productivity.

In the meantime, in order to achieve such a radical cost reduction, Honda reduced its product specifications to the levels considered necessary for the Vietnamese market. For example, the maximum driving speed applied in defining product and process parameters for the Wave Alpha was set at 80 kilometres per hour. 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).

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[62] Upon its initial launch, the price of the Wave Alpha (US$719) was 36% of the official price of HVN's most popular model, the Super Dream, in 2000 (US$1,990) (Nguyen Duc Hien 2004: 234). This was followed by the launch of a low-priced model in Thailand in June 2002, the Wave 100.

Table II-7. Responses of Honda Group Suppliers to the Launch of the Wave Alpha

Name	Price Reduction Margin Requested by HVN	Supplier's Response to HVN's Requests	Results
J2	40%	Priority was to avoid loss of orders. The supplier decided to accept HVN's targets before actually coming up with ways of meeting them.	The supplier won orders for all existing types of component.
J3	50%	Priority was to avoid loss of orders, even if the supplier initially incurred losses.	The supplier won orders for all existing types of component. It later came up with ways to achieve cost reduction.
J6	(n/a)	The supplier made internal attempts at cost reduction and suggestions for specification changes to HVN.	The supplier only won orders for 3 of 16 existing types of component.
J7	40%	The supplier provided quotations in accordance with the extent of cost reduction it could achieve.	The supplier lost orders for one of two existing types of component but won orders for other components as it was able to meet HVN's target price.

Source: The author's interviews (J2 #1; J3 #1; J6 #1; J7 #1).

On the other hand, the non-standard nature of parameters was maintained. With the aim of reducing product development costs, Honda made extensive use of component designs utilised in its existing models (Ohara et al. 2003) rather than renewing the whole vehicle system – the conventional Japanese approach to product development (Paper I). However, the Wave Alpha was still non-standard in the sense that component designs were customised to Honda.

In summary, HVN's priority shifted from quality to price reduction. The company's product and process parameters were still non-standard but less complex than in the previous stage, and thus could be communicated between the lead firm and its suppliers with relative ease.

5.2.2 Lead Firm Attempts at Realigning Capabilities

The shift in HVN's production strategy was accompanied by corresponding changes to the structure of the company's value chain. In order to reduce component procurement costs, HVN sought to substantially expand sources in Vietnam and abroad (interview #2). Apart from the need to exploit new sources of lower-priced components, expanding local sourcing became a priority, as this enabled HVN to save on import tariffs and to conform to the local content stipulations implemented by the Vietnamese government in the early 2000s. Increasing the number of suppliers – especially those with high levels of price-based competitiveness – was also expected to put competitive pressure on incumbent suppliers.[63]

Since one could hardly expect Japanese FDI in component manufacturing to increase immediately (Ichikawa 2001), HVN inevitably had to depend on non-conventional component sources in expanding local supply. The remarkable increase in HVN's local content ratio from 52% in 2001 to 83% in 2004 (Table II-4) was achieved primarily by incorporating non-Japanese suppliers into the company's value chain. As Honda engaged in an extensive search for suppliers in Vietnam by mobilising experts from Japan,[64] numerous Taiwanese, Korean and Vietnamese suppliers were admitted into the company's value chain (Table II-4). Another noteworthy development was that HVN sought to import components for the first time from China. Upon the launch of the Wave Alpha, HVN sourced 27 types of component from local Chinese companies servicing Honda's joint venture motorcycle manufacturer in China (interview #2).

While the above developments might look impressive, the key question is the extent to which such adjustments changed the alignment of relevant capabilities and power

[63] This effect is clearly illustrated in an interview with Japanese *keiretsu* supplier J2 #1 in 2002. Noting that Honda was engaged in an extensive search for new suppliers, the general director commented that the price-based competitiveness of local suppliers would pose a real threat to Japanese companies.

[64] The search for potential suppliers conducted in the years 2001–2 was the most extensive in HVN's history to date, covering as many as 80 companies (interview with HVN #4).

relations between lead firm and suppliers. Apparently, HVN hoped to achieve two aims simultaneously: to enhance its purchasing power, and to spur price-based competition between suppliers. Both conditions had to be met if HVN were to exploit market forces whilst maintaining its non-standard product and process parameters. However, this strategy only achieved partial success at this stage because the company was prevented from realigning the necessary structure of capabilities to achieve these aims.

On the one hand, by reducing prices, HVN sought to rapidly expand its sales volume, which would not only enable the lead firm and its suppliers to realise economies of scale but also allow HVN to exercise purchasing power over its suppliers. Indeed, this seemed a likely scenario in 2002.[65] However, HVN's ambitions were blocked by a series of restrictions introduced by the Vietnamese government from 2002 onwards on motorcycle registration and the capacity expansion of foreign invested motorcycle manufacturers (as discussed in Section 2.3). The resultant slow growth of the market as well as HVN's inability to invest in expansion of production capacity meant that the company's annual production increased modestly. In fact, it had only reached some 400,000 units by 2004 – above the 300,000-unit minimum level required for economically viable non-capital-intensive production but barely sufficient for the lead firm to exercise purchasing power over suppliers.

On the other hand, HVN's attempt to increase the number of suppliers was aimed at breaking its dependence on incumbent suppliers and spurring competition between them as well as new ones. Again, this strategy was thwarted by the limited manufacturing

[65] A few Japanese suppliers noted that in 2002 they had been requested by HVN to prepare for rapid capacity expansion (interviews with J2 #1; #2; J4 #1), which clearly demonstrates HVN's ambitions before quantitative restrictions on imports of components were imposed (Section 2.3). Also, when HVN's annual production exceeded one million units in 2007, the company's administrative manager noted, "We could finally achieve what we had endeavoured to achieve for a long time" (interview HVN #3).

capabilities of newly admitted suppliers together with the aforementioned small purchase volume. While some Taiwanese suppliers had good track records of supplying components to Honda in Taiwan (interview with HVN #2), only one of the four Vietnamese suppliers interviewed by the author and admitted to HVN's value chain in Stage II had ever served foreign customers (Table II-5).

The shortage of supplier capability had to be dealt with by lead firm intervention in the form of technical assistance. However, as will be discussed below, quality problems recorded by several suppliers – those in China in particular – were so serious that HVN was eventually compelled to stop placing orders with them (interview #2) – the sort of decision Honda makes only in truly exceptional circumstances (interview #3). By 2004, only a few types of components – as opposed to 27 upon the initial launch of the Wave Alpha – were imported from China (interview with HVN #2).

In the meantime, the radical price reduction targets announced by HVN upon launching of the Wave Alpha compelled the incumbent suppliers – including those belonging to Honda Group – to take urgent measures to reduce production costs. All such suppliers interviewed by the author, both Japanese and Vietnamese, eventually achieved HVN's price reduction targets with their own cost reduction efforts.[66] For instance, supplier J6 won contracts for only three out of the sixteen types of components upon the initial launching of the Wave Alpha, but because of significant productivity improvements, company won back contracts for all of the remaining thirteen types of components by 2004 (interview #1).

[66] Examples of measures taken by interviewed suppliers to achieve targets include the localisation of imported components and materials; productivity improvement in plant operations; and downward adjustments to product and/or process specifications (subject to Honda's approval) (interviews with J2 #1; J3 #1; J6 #1).

In short, HVN's attempt at realigning capability within its chain with the aim of achieving substantial cost reduction was only partially successful at this stage; first, because government policy impeded HVN in expanding production; and second, because supplier capabilities took time to develop.

5.2.3 The Constant Struggle to Introduce Market Forces

As a result of the partial realignment of capabilities, the emerging pattern of transactional governance was shaped by a tension between the need to achieve radical price reduction – which called for increased use of market forces – and absence of the capability alignment required for the effective functioning of market forces.

HVN's attempts at making use of market forces may be clearly observed in the company's ordering procedure upon the launch of the Wave Alpha, orders being no longer commissioned straight to a fixed group of suppliers but based on competition determined by price. Prior to the launch of the new model, HVN announced radical price reduction targets and asked for quotations from an increased number of suppliers (interviews with J2 #1; J3 #1; J7 #1). Table II-7 summarises the responses of four incumbent suppliers, all of which had direct capital relations with Honda. They were thus compelled to meet a price reduction target ranging between 40% and 50% or risk losing orders. In this regard, in 2004, the general director of supplier J6 recalled: "[Upon launching of the Wave Alpha,] we received pressure [from Honda that they] would switch to Taiwanese, Korean, or Chinese suppliers if we could not achieve the target prices" (interview #1). In August 2002, the general manager of supplier J2 indeed admitted that the decision was whether to accept the cost reduction target presented by Honda or to lose orders (interview #1).

However, responses varied. Suppliers J2 and J3 strove to meet targets on the understanding that they would be obliged to sacrifice profits or even incur losses during initial years. On the other hand, suppliers J6 and J7 gave up supplying some of the components for which they were asked by HVN to provide quotations. The fact that even supplier J6, with which Honda had direct capital and personnel relations, won orders for only 3 out of the 16 types of component that the company had previously supplied to HVN illustrates the lead firm's determination to trade with the cheapest available source *regardless of nationality or keiretsu ties*.[67] This marked an important shift away from Honda's conventional sourcing practices. Indeed, suppliers were expected to *independently* come up with measures to meet the stringent targets imposed on them, financial support previously granted to such suppliers having been terminated by this stage.

Although the above changes in HVN's ordering practices might look impressive, the new alignment of lead firm and supplier capabilities prevented the sustained operation of price-based competition, a situation that eventually led to the revival of previous patterns of dependence. First, HVN's limited purchase volume meant that dual sourcing was not feasible: to the extent that non-standard component designs were maintained, 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), an output level that, as discussed above, had not been reached by the end of Stage II.

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[67] An important point to note is that most of the components adopted in the Wave Alpha carried designs previously developed for Honda's pre-existing models (Ohara et al. 2003). The fact that suppliers had not participated in component design processes is likely to have been a key consideration behind the sourcing approach adopted for this particular model.

Second, as noted in Section 5.2.2, the limited manufacturing capability of newly admitted suppliers posed a serious constraint to HVN's attempts to use them to spur competition between suppliers. This, combined with the efforts of incumbent suppliers to meet HVN targets, resulted in the revival of the traditional mutual dependence between the lead firm and its old suppliers.

Third, limited supplier capabilities also forced HVN to continue to act as a 'foster parent' or provider of technical assistance. New entrants were offered technical assistance in the form of periodic monitoring and joint problem-solving exercises (interviews with V5 #1; V7#1); although the time frame of assistance was found to be generally shorter than it had been in respect of suppliers entering HVN value chain in the 1990s, the former – as discussed above – extending for between one and two years, while the latter was approximately six months (interviews with V5 #1; V7#1).

The above findings show that the magnitude of short-term adjustment was not as substantial as the existing literature suggests after all. While HVN's response to the China shock did include a number of radical changes to conventional sourcing practices, they were largely emergency measures intended to deal with immediate needs. Within a few years, it became apparent that the existing capability structure constrained the sustained functioning of market forces, the result being the revival of traditional patterns of dependence and persistence of lead firm assistance.

5.3 Stage III: Transformation into an 'Institutionalised Competition' Variant

As the industry entered the phase of rapid FDI-led development, fundamental changes took place in HVN's value chain. The company's attempts to introduce market forces into transactional governance, which had only partially succeeded in the previous stage, culminated in what the present study refers to as an ‘institutionalised competition’ variant of the captive model. This variant of the captive organisation systematically combines the advantages of long-term, close relations with a fixed group of suppliers and the benefits of market forces with the aim of extracting constant performance improvement out of suppliers. The following subsections describe and explain the transformation of HVN’s value chain during this most dynamic stage; analysis that no previous study has explicitly attempted.

5.3.1 Shifting Market Demand: The Increasing Complexity of Parameters

The third stage of industrial development was characterised by increasing sophistication of consumer demand. 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 response to the changing market landscape, Honda implemented a number of important adjustments to its product strategy. First, the complexity of product parameters increased. Reflecting the growing market, the number of new models launched by HVN increased substantially by Stage III (Table II-8). In order to respond to the increasing sophistication of consumers, HVN launched a greater number of models that 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.[68]

Table II-8. 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 A1	28	11	4	28	105	112	191	66	545
Local Assembler A2	19	15	0	10	8	8	15	0	75
Local Assembler A3	10	1	5	25	43	56	112	8	260
Local Assembler A4	8	6	4	8	23	16	9	9	83
Local Assembler A5	19	9	4	7	8	21	15	3	86
Local Assembler A6	0	1	2	5	10	12	10	1	41

Source: The author, from data obtained from the Vietnam Register (http://www.vr.org.vn), accessed 6 January 2009.

Second, process parameters also grew more complex. HVN's emphasis shifted from the one-off radical price reduction in the previous stage to incremental yet continuous improvement in *overall QCD levels*. Of these three criteria, the highest priority was attached to quality levels. Asked about the company's focus in 2007, HVN's manager remarked:

> [Of QCD], quality is the most important. Since Vietnamese consumers demand very high levels of quality, we need to keep on paying close attention to [our] quality levels…We emphasise quality at source. That is, we ask suppliers to guarantee quality levels within their production processes. (HVN #3)

It is worth emphasising that HVN began to demand that suppliers ensure *quality at source*. This was in sharp contrast to the company's standards in Stage II, when it tolerated defects in components imported from China so long as price advantages outweighed the cost of inspecting 100% of the parts (interview with HVN #2). However, such preoccupation with quality does not mean that price was no longer important. Unlike the one-off cost reduction in the early 2000s, suppliers were now requested to achieve incremental cost reductions of 5% every year (interview with HVN #5). With a

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

growing volume of orders (see below), delivery deadlines also became increasingly tight, most Japanese and some Vietnamese suppliers being required to implement 'just in time' delivery several times a day.[69]

In terms of degree of standardisation, the non-standard nature of product parameters was maintained. However, since approximately 2004, the company's regional R&D base in Thailand started to make extensive use of common component designs for internal parts across models to be launched in Thailand, Indonesia and Vietnam (interview with Honda R&D Southeast Asia #1). Whilst this marked a significant move away from the Honda's conventional approach to the renewal of most component designs when launching new models, the fresh approach enabled the company to develop large varieties of models at low cost, while realising economies of scale in manufacturing (ibid.).

In short, HVN's product and process parameters became increasingly complex, extending to non-price dimensions and demanding in terms of requisite levels. While component designs continued to be specific to Honda, the use of common parts across models laid the foundations for the realisation of economies of scale in manufacturing and lead firm purchasing power over suppliers.

5.3.2 Full Realignment of the Capability Structure

Whilst shifting demand certainly influenced the direction and degree of organisational transformation, even more important was the driver for change coming from within the value chain: the shifting alignment of capabilities. This occurred partly as a result of HVN's active attempt to create the necessary conditions for transforming its 'foster

[69] The frequency of deliveries in 2007–2008 ranged between 5–8 times a day (interviews with suppliers J2 #2; J3 #3; J6 #2; J10 #1; V1 #3).

parent' model of industrial organisation, and partly as a result of incidental changes in Vietnamese government policy that were beyond the company's control.

On the one hand, the policy changes discussed above led to significant expansion of the market as a whole, as well as HVN's market shares in particular. As the government abandoned a series of legislation that had repressed the overall market growth, sales of motorcycles increased rapidly, even exceeding levels during the China shock (Figure II-1). Japanese lead firms expanded their shares as they were released from constraints on expansion of production capacity. HVN's annual production in particular exceeded one million units by 2007 (Figure II-2). This was an important landmark because such purchase volume not only exceeded the minimum efficient scale even for components requiring capital-intensive production processes, but also called for the dual sourcing of each type of component (interviews with HVN #3, #4). Accordingly, HVN started to exercise huge purchasing power over its suppliers.

On the other hand, the number of suppliers in Vietnam as well as their overall capability levels increased remarkably. First, as a consequence of the rapid market expansion, FDI from component suppliers with established records of serving Japanese motorcycle manufacturers increased, including Honda Group suppliers that had previously been hesitant to invest in Vietnam. Of the total of 38 investment licences granted to Japanese motorcycle component manufacturers between 1992 and 2007, as many as 20 projects were licensed between 2004 and 2007.[70]

Second, as a result of HVN's attempts to mobilise and nurture local suppliers from the late 1990s, the capability levels of Vietnamese firms improved substantially. This is

[70] Calculated by the author using data provided by the Ministry of Planning and Investment of Vietnam, which is available in tabulated form in Fujita (2008).

clear from the author's in-depth case studies of HVN's first-tier Vietnamese suppliers (Table II-5). By Stage III, most of the suppliers had reached the assimilative level whilst some even progressed to the adaptive level for one or more dimension of their production activities. Such improvement in the production-related capabilities of local suppliers is corroborated by the assessment of HVN managers. In 2009, the company's procurement manager remarked that, with a number of exceptions, local Vietnamese suppliers were generally able to meet its requirements without the hands-on technical assistance (interview #5).

As a result of the increased number of suppliers in Vietnam and their improved capability levels, HVN's local content ratio and number of suppliers increased rapidly, with the former reaching 90% and the latter reaching 58 by 2007 (Table II-4). However, even more significant were the structural changes within the value chain. Having obtained the ability to switch suppliers, HVN reorganised its value chain, adopting differentiated approaches to the following three different groups of suppliers – with emphasis on what HVN manager referred to as "group suppliers" (interview #5).

The first group consisted of Honda group (*keiretsu*) suppliers. Among the embedded cases, J2, J3, J6, J7, J10 and J11 belonged to this category. Having proprietary component design and/or manufacturing competencies that Honda relied upon, their parent companies in Japan had developed a long-term association with the former mediated by capital and personnel relations.

The second group was Honda's joint venture partner, Vietnam Engine and Agricultural Machinery (VEAM) Corporation, 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 V7, V9, V13, and V14 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 the executive with a good understanding of Japanese management practices and willing to expand business with Japanese companies also account for HVN's preference to outsource key components to VEAM members (interview with HVN #5).

The third group consisted of suppliers of non-core components, of all nationalities. These suppliers were expected to provide external manufacturing capacity. Suppliers J4, J5, J8, J9, V1–6 and V8 fell under this category.

Suppliers belonging to the first two groups received increasing priority in Stage III. They not only accounted for nearly half of suppliers newly admitted into HVN's value chain between 2004 and 2007 (Table II-4) but also began to receive a mounting proportion of HVN's expanded orders. Indeed, Honda Group suppliers received increasing orders not only for core- but also non-core components that had previously been subcontracted to Group 3 suppliers.[71] In localising the production of high-precision engine components, HVN designated two VEAM suppliers (V7 and V9) to undertake the initial processing of these components (interviews with HVN #4, #5).

In addition to the shifting alignment of supplier capability, progress in Vietnamese trade

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[71] In addition to Table II-6, the following case provides a clear illustration. After J10 – 100% owned by Honda – was established in 2005 to manufacture a large variety of components, supplier J9 – a Japanese non-*keiretsu* provider of non-core components – was requested to supply sub-components to J10 instead of directly to HVN as the company had done previously. Supplier J9 lost further orders for sub-components after 2007 as supplier J10 started to manufacture them in-house (interview with J9 #1).

liberalisation provided HVN with potential access to overseas sources of suppliers, although they remained an unused option at this stage. As part of the country's bid to become a member of the World Trade Organisation (WTO), Vietnam had dismantled local content rules by the end of 2003, and, in accordance with the tariff reduction schedule under the Association of Southeast Asian Nations (ASEAN) Free Trade Area (AFTA), Vietnam reduced its tariffs on most motorcycle components imported from ASEAN-6 countries from 50% in 2005 to 5% in 2006.[72]

Although the high levels of HVN's local content ratio after 2006 are an illustration of the company's preference to source the bulk of its motorcycle parts locally, the company now had the option of importing components at competitive prices from Thailand and Indonesia – the two countries with the most advanced automotive component supply bases in Southeast Asia.[73] Moreover, with the expectation that trade liberalisation under the ASEAN–China Free Trade Area would progress in the not-too-distant future, Honda was eager to make a second attempt at sourcing components from China. Its procurement manger emphasised that limited manufacturing capabilities possessed by suppliers in China – the main reason for the failure of the first trial upon the launch of the Wave Alpha – had improved to a considerable extent by 2008 (interview with HVN #4).

To sum up, the distribution of lead firm and supplier capabilities changed substantially as a result of both HVN's active attempts to realign capabilities within the industry and

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[72] ASEAN-6 includes Brunei, Indonesia, Malaysia, the Philippines, Singapore, and Thailand. While motorcycle components had long been excluded from Vietnam's tariff reduction schedule for AFTA, the Vietnamese government announced a schedule for these items for the first time at the end of 2004 (Government Decree 213/2004/ND-CP dated 27 December 2004).

[73] Thailand has established itself as the hub of the Southeast Asian automotive industry (Lecler 2002; Higashi 2006). With the largest motorcycle market in Southeast Asia and a longer history of industrialisation, Indonesia is also more advanced than Vietnam in terms of the development of the component industry (Sato 2011).

incidental policy changes. With its huge purchasing power and accumulating supplier capability, HVN gained the capacity to reorganise its suppliers in accordance with its requirements.

5.3.3 An 'Institutionalised Competition' Variant Emerges

The shifting capability alignment enabled HVN to implement organisational adjustments to meet changing product and process requirements. The result was a form of organisation referred to as an 'institutionalised competition' variant of the captive chain. Key changes in transactional governance were three-fold.

First, the level of supplier dependence on HVN increased substantially regardless of the type of supplier. The large volume of orders meant that suppliers were increasingly dependent on HVN for their sales. By Stage III, this was the case not only with Honda Group suppliers but also local Vietnamese suppliers. Local suppliers like V2, V3, V7, V8, and V13 depended on HVN and its related companies for between 50% and 100% of their sales (Table II-6).

Second, HVN's provision of technical assistance diminished and was substituted with less generous forms of lead firm engagement with suppliers: collaborative initiatives for achieving incremental productivity improvement, referred to as value analysis (VA) and value engineering (VE);[74] systematic monitoring of supplier performance; and joint problem-solving exercises in the cases of troubles (interviews with HVN #4, #5). All three of the aforementioned groups of suppliers were subject to stringent QCD performance targets, which were incrementally upgraded every year (ibid.). Since most

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[74] VA and VE refer to activities designed to obtain the best value of a component by analysing its function and cost. In Japanese manufacturing industries, these techniques have been widely applied by lead firms and suppliers as joint problem-solving exercises aimed at mutual gain (Asanuma 1989; Sako 1992; Nishiguchi and Brookfield 1997).

suppliers were more or less capable of reaching such targets, technical assistance beyond systematic monitoring and troubleshooting was offered only selectively with regard to strategically important targets. Group 2 suppliers became strategic targets as they were subcontracted high-precision engine components calling for sophisticated production-related capabilities (ibid.).

Third, HVN's made use of what this study refers to as 'institutionalised competition' among a pool of carefully selected suppliers.[75] This form of competition is distinguished from market competition in arm's-length organisation in that (1) the scope of competition is limited to those suppliers that pass a careful selection process, the lead firm essentially maintaining long-term relations with each of them; and (2) selection of suppliers is not based principally on price but rather on comprehensive ratings of QCD performance, the assessment of VA and VE proposals submitted by suppliers, and the lead firm's policy on the allocation of business shares[76] (Sako 1992; Asanuma 1989).

In practice, the implications of institutionalised competition varied according to type of supplier. Those of non-core components (Group 3) faced increasingly intense competition, and since alternative sources could be found for them, HVN retained the capacity to actually switch suppliers. Moreover, even after a contract was awarded, HVN sought to maintain supplier diligence by adjusting its order volume dependent on QCD performance (interview #5). Supplier V2 remarked that the company had to think carefully in submitting quotations to HVN as it had approximately ten competitors all bidding to supply the lead firm (interview #2). Among suppliers of plastic components,

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[75] "Institutionalised competition" is a term coined by Sako (1992); Richardson (1993) alludes to "parallel sourcing"; while Fujimoto (1999) refers to patterns of supplier competition in the domain of product development in the Japanese automobile industry as "development competition". Similar practices are also discussed by Asanuma (1989).

[76] Asanuma (1989) does not discuss what lead firm "policy" specifically means, but HVN's emerging priorities in terms of Honda Group and VEAM suppliers are typical examples.

V1 was in receipt of increasing orders for high-precision parts and moulds, while V5 still focussed on relatively simple components and faced diminishing orders (interviews with V1 #2, #4; V5 #2).

By contrast, the substantive degree of competition faced by suppliers in first two groups was apparently weaker. To the extent that HVN opted to expand local sourcing, it had to depend on these suppliers as there were no domestic alternatives equipped with similar levels of capability to supply core components to the required standards. Moreover, with regard to Honda Group suppliers, the fact that the manufacturer had long depended on the component design capabilities of parent companies in Japan or affiliates in Thailand certainly remained a key consideration in HVN's sourcing decisions. As of 2008–09, Honda Group members and VEAM suppliers continued to receive orders from HVN for 100% of the components they specialised in (interviews with HVN #4, #5; J2 #2; J3 #2; J6 #2; J10 #1; J11 #1).

However, there were indications that even these suppliers were beginning to experience growing competition. By Stage III, HVN had started to solicit quotations even for core components from multiple sources – typically suppliers in China – with the aim of applying pressure to the candidates (interview #3). Indeed, all Honda Group suppliers interviewed by the author between 2007 and 2009 expressed concern about growing competition with overseas suppliers, including subsidiaries of their parent companies located in other Southeast Asian countries. For example the general director of supplier J3 noted that the company was stepping up its efforts to reduce costs in the face of competition not coming only from Thailand and Indonesia but also from China in the longer term (interview #2). And the general director of J2 remarked: “So far HVN has only asked for quotations from us, but they tell us that they will buy from whichever source offers the lowest price; we face intense price-based competition” (interview #2).

In short, the shifting capability alignment enabled HVN to fully adjust its value chain to meet changing product requirements. The result was an ‘institutionalised competition’ variant of the captive organisational model, which not only combined the benefits of long-term, collaborative relations with suppliers and the advantage of market forces, but also incorporated adaptations to meet market, industrial and policy conditions prevailing in Vietnam. The preferential sourcing approach in respect of the VEAM Corporation and the soliciting of quotations from companies located abroad are examples of such modifications.

5.4 Summary and Discussion

The in-depth empirical analysis in this section shed light on the dynamic transformation of HVN’s value chain over a decade from the late 1990s. In terms of the first sub-question, it was argued that the seemingly radical organisational shift immediately after the China shock emphasised in the existing literature transpired to be short-lived, while a more dynamic and longer-lasting organisational transformation occurred in the medium term. By this time, HVN’s value chain had been transformed from a ‘foster parent’ variant of the captive model into an ‘institutionalised competition’ variant – a hybrid organisational form that systematically combined the conventional advantages of long-term relations with suppliers and the benefits of market forces. In the end, Honda managed to weather challenges emanating from China by modifying its organisational model rather than transforming it into something different.

With regard to the second sub-question, the empirical analysis demonstrated that the nature of the product was not sufficient to explain the trajectory of organisational transformation. While HVN was quick to adjust its product strategy, the functioning of the market forces it had intended to introduce was constrained by the existing alignment of lead firm and supplier capabilities. HVN's production volume was critical in removing this obstacle. By lowering prices, it sought to increase its scale of production but this happened only after the Vietnamese government reversed its restrictive policy towards foreign motorcycle manufacturers.

When HVN's production was finally permitted to expand, it started to exert huge purchasing power over its suppliers. As an increasing number of foreign firms were attracted to the growing market, supplier capabilities also started to accumulate. An important point to note is that even though some suppliers could not be substituted *domestically*, the capabilities they possessed were not indispensable to HVN in the sense that there were *regional* alternatives. This explains why the accumulation of supplier capabilities did not result in a shift to a relational chain. Rather, it was the combination of HVN's huge purchasing power and growing supplier capabilities – but not complementary competencies – that allowed HVN to exploit institutionalised competition to extract constant improvement in manufacturing performance out of its suppliers.

On the whole, the analysis in this section has demonstrated that the Japanese organisational model in its original form was not readily adaptable to the emerging Vietnamese market. Although HVN was quick to adjust its product strategy in response to the China shock, and actively sought to realign the capability structure in order to create conditions conducive to the effective functioning of the market forces it intended to introduce, these attempts failed to produce immediate results. This is because the government introduced policies that explicitly discriminated against foreign motorcycle manufacturers, and supplier capabilities took time to be nurtured or realigned. It was eventual incidental policy change as well as medium-term progress in accumulation of supplier capabilities that laid the foundations for the dynamic transformation of the Japanese model in Stage III, a shift that enabled HVN to establish itself as an increasingly dominant actor in the Vietnamese market.

6. The Emergence and Transformation of the Vietnamese–Chinese Chain in Vietnam

This section turns the focus to the Chinese organisational model. Rather than being *transplanted* by a major TNC – as had been the case with the Japanese model – the Chinese model emerged spontaneously in Vietnam in the early 2000s, as Chinese exporters of motorcycle components, Vietnamese assemblers of imported components, and component suppliers of different nationalities independently reacted to growing business opportunities. Local Vietnamese motorcycle assemblers emerged as lead firms that initially assembled imported Chinese components, but gradually expanded local sourcing as the government stepped up its enforcement of local content rules.

In an attempt to examine the dynamic trajectories of organisational transformation, the analysis now focuses on the second and third stages of Vietnamese motorcycle industrial development:

- Stage II (2000–2004), when the Chinese model emerged in Vietnam
- Stage III (2005–2008), when the model was transformed as lead firms and suppliers reacted to challenges posed by Japanese motorcycle manufacturers

6.1 Stage II: The Emergence of Market-based Chains

The empirical analysis begins by examining the features of the Chinese model as it emerged in the early 2000s. Taking account of the dispersed structure of this sector of the industry at this stage, the emphasis is on sector-level analysis, which is complemented by analysis of embedded cases of several relatively large assemblers.

6.1.1 Minimal Coordination Requirements: Low Quality and De facto Standardisation

The types of motorcycles produced by local Vietnamese assemblers were strikingly different from the Japanese-brand vehicles that had prevailed in the domestic market, the product and process parameters of the former being highly standardised and simple.

First, the high level of standardisation requires elaboration. The existing literature on Vietnamese motorcycle assemblers points out that *modularisation* allowed arm's-length networks to prevail in this sector (Pham Truong Hoang 2007; Nguyen Duc Tiep 2006; The Motorbike Working Group 2007). However, the present study found otherwise. Rather than transforming motorcycles from integral to modular design architecture, Chinese manufacturers used several popular Japanese models as de facto standards for duplicative imitation of the external configuration (Ohara 2001; Ge and Fujimoto 2004) – the phenomenon that this paper refers to as the de facto standardisation of Japanese models. As argued in Paper I, standardisation of this sort is at best partial because full compatibility of components can only be guaranteed insofar as they are manufactured in precise accordance with the original Japanese base model drawings. This was not the case in China, where uncoordinated duplicative imitation gave rise to components that were not strictly compatible.

The present study found that a similar situation prevailed in Vietnam in the early 2000s. In this period, de facto standardisation centred on an even smaller number of Honda's popular models than in China. The author's interviews of motorcycle retailers in Hanoi and Ho Chi Minh City in August 2002 found that the overwhelming majority of products imitated two of Honda's most popular models, Dream and Wave, most of them featuring C100 or C110 engines with Chinese brands.[77] Embedded cases of assemblers also confirmed de facto standardisation of a limited number of Japanese models. As of the early 2000s, all three assemblers for which detailed data were available (A1, A2 and A4) produced imitations of Dream and/or Wave (interviews and/or factory visits at A1 #1; A2 #1; A4 #3).

As had been the case in China, de facto standardisation of Japanese models in Vietnam failed to ensure component compatibility because duplicative imitation took place not on the basis of a single, detailed drawing but was invariably the result of uncoordinated, repeated duplication of products available on the market, many of which themselves carried minor modifications to original designs (Pham Truong Hoang 2007), with varying yet generally low levels of precision (interviews and/or factory visits at V15 #1, #2; V18 #1; V19 #1).

The second feature is simple product and/or process parameters. This was confirmed by the lack of lead firm requirement beyond price level. The two embedded assemblers for which detailed interview data are available (A2 and A4) only specified the names of base models or provided samples for replication at best, and neither provided detailed drawings or specifications in terms of precision levels, materials, or production

[77] The most ubiquitous imitation brands (e.g. 'Hongda') and/or popular Chinese brands such as Loncin, Lifan and Zongshen were displayed on engine covers (the author's field visits, and interviews with motorcycle retailers in Ho Chi Minh City and Hanoi in August 2002).

processes (interviews with A2 #1; A4 #3). These findings are corroborated by the author's interviews with suppliers, as they were not offered the sorts of detailed lead-firm specifications discussed in the previous section. Suppliers of engine parts explicitly stated that they adopted a single preconfigured design for all their customers (interviews with V17 #1; V19 #2; T6 #1), while suppliers of other components were typically provided with samples for replication (V15 #2; V23 #1; T7 #2).

Rather, the focus of assemblers was overwhelmingly on cost. From 2000 to 2001, the prices of their products ranged between US$445 and US$565,[78] which was roughly a quarter of the official price of HVN's most popular model, the Super Dream (U$S1,990) in 2000 (Nguyen Duc Hien 2004: 234). It was also much lower than the price of the Wave Alpha (US$719), the budget model that HVN launched in 2002. The average price of motorcycles produced by the case assemblers in 2004 was US$470 (Table II-9).

In summary, de facto standardisation and emphasis on price-based competitiveness significantly reduced the need for explicit coordination. However, to the extent that de facto standardisation failed to ensure full component compatibility, the need for coordination could not be eliminated completely.

6.1.2 Dispersed Structure, Limited Capabilities

To begin with, the Vietnamese–Chinese chain had a fragmented structure consisting of a large number of assemblers and a moderately large number of suppliers, both of which were small in scale and possessed limited capability. None of these firms held sufficient capability to exercise power over others.

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[78] 'The unpredictable fever' (*Saigon Times Weekly* dated 17 November 2001); 'Glut of imported motorbikes sparks worries about congestion, accidents' (*Viet Nam News* dated 14 December 2001).

The overall structure of assemblers in the early 2000s can be confirmed on the basis of official statistics as well as embedded cases. As of May 2002, 51 Vietnamese motorcycle assemblers were in operation.[79] Forty-one such firms assembled less than 40,000 units in 2000, while the largest firm (A2) accounted for just 8.8% of the total turnover of all local assemblers. They had limited knowledge of products and/or production processes: of the 51 assemblers registered as of 2002, only 7 had initial investment in own-production capacity (Ha Huy Thanh et al. 2003: 335).

None of the embedded case assemblers, which were known to be among the largest in the early 2000s, had manufacturing experience prior to starting motorcycle production (Table II-9). Their focus on the assembly of imported or purchased components also meant that they did not take on product development, design, manufacturing of key components, marketing, or branding.

Based on official statistics, the total number of suppliers participating in the Vietnamese–Chinese chain in 2002 is estimated to be about 50.[80] However, it is suspected that the actual figure was much larger as hundreds of companies entered into the production of relatively simple motorcycle components for local assemblers.[81] With the exception of Taiwanese firms – most of which were specialised providers of components already incorporated into Taiwanese and/or Japanese chains (Chen and Jou 2002) – suppliers in the Vietnamese–Chinese chain possessed limited design and/or

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[79] Data provided by the Ministry of Industry of Vietnam. While this number is smaller than the number of assemblers in China – where Ohara (2006a: 22) notes there were 154 motorcycle manufacturers in 2003 – it can still regarded as very large given the much smaller size of the Vietnamese market.

[80] The author's estimate based on a list of firms producing motorcycle components in 2002 provided by the General Statistics Office, excluding Japanese, Taiwanese, and Vietnamese companies that were known to have participated in the Japanese chain.

[81] Nguyen Duc Hien (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.

Table II-9. Profiles of Local Assemblers Selected as Embedded Case Studies

Assembler			A1	A2	A3	A4	A5	A6
Stages for which detailed data are available			Stages II and III	Stage II only	Stage III only	Stages II and III	Stages II and III	Stage III only
Experience prior to entering into motorcycle assembly			Trading consumer electronics	Diverse (trading, tourism, real estate, etc.)	n/a	Trading (motorcycles and other products)	Trading (motorcycles and other products)	Motorcycle dealer
Market share	2000	%	8.5%	8.8%	3.8%	1.9%	1.3%	(not on the list)
		Ranking	3rd	1st	5th	17th	31st	(not on the list)
	2006	%	23.1%	1.8%	8.3%	1.6%	5.1%	2.8%
		Ranking	1st	17th	4th	19th	7th	9th
Annual production (units)		2000	148,000	107,900	72,450	23,731	34,600	(not on the list)
		2007	300,000	(n/a)	95,000	24,000	20,469	30,000
Average price of motorcycles (US$)		2004	365	451 *	(n/a)	439	622	(n/a)
		2007	310	(n/a)	279	373	745	497
Number of new models registered		2001–04	71	44	41	26	39	8
		2005–07	474	31	219	57	47	33
Local content ratio (%)		2003	(n/a)	(n/a)	(n/a)	85	80	(n/a)
Number of suppliers		2007	100	(n/a)	55	60	80	48

Notes:
1) n/a = not available
2) 'Market share' denotes the percentage of the market and rank of respective suppliers of all registered Vietnamese motorcycle assemblers included in lists provided by the Ministry of Industry (for 2000) and the General Statistics Office (for 2006).
3) 'Number of new models registered' denotes the number of new models registered with the Vietnam Register for sales in the domestic market.
4) * The A2 average price is for 2003, while the data for all other assemblers are for 2004.

Sources:
1) Turnover: Ministry of Industry (for 2000) and the General Statistics Office of Vietnam (for 2006).
2) Number of new models registered: The author, based on data from the Vietnam Register (http://www.vr.org.vn), accessed 6 January 2009.
3) All other data obtained from the author's interviews and questionnaire surveys conducted in collaboration with the Vietnam Institute of Economics, Vietnam Academy of Social Science.

manufacturing capabilities.

Virtually all Vietnamese suppliers selected as embedded cases were companies previously engaged in the small-scale production of replacement components, bicycle parts, or household metal and plastic products for the domestic market, and they only acquired rudimentary capabilities in Stage II (Table II-10).

Table II-10. Capabilities Acquired by Vietnamese Suppliers in Vietnamese–Chinese Chains

	Before Stage I	Stage I	Stage II	Stage III
V13	Machinery components for SOEs		Operational (Prd)	(Shift to other chains)
V14	Machinery components for SOEs		Operational (Prd)	(Shift to other chains)
V15	Bicycle components		Operational (Prd/Eq)	(Shift to other chains)
V16	Bicycle components		Adaptive (Prd)	
V17	Trading		Operational (Eq/PM)	(Shift to other chains)
V18	Bicycle components	Operational (Prd/Eq/PM)		(Shift to other chains)
V19	Bicycle components		Operational (Prd/Eq)	(Shift to other chains)
V20	Replacement components		Operational (Prd/Eq)	Operational (Prd/Eq)
V21	Trading			Operational (Prd/PM)
V22	Trading		Operational (Prd/PM)	(Shift to other chains)

Notes:

(1) For periods prior to entry into or after exit from the Vietnamese–Chinese chain (the unshaded area), main lines of business are given.

(2) For periods after entry into the Vietnamese–Chinese chain (the shaded area), the level of new product introduction and production-related capabilities acquired by each supplier in Vietnamese–Chinese chain by the respective stage is shown.

(3) Types of capability are abbreviated as follows: Prd = new product introduction capability; Eq = equipment-related capability; PM = production management capability.

Source: The author's interviews with suppliers, compiled on the basis of Paper III.

Unlike the Japanese chain, assembler–supplier relations in the Vietnamese–Chinese chain were fluid. Table II-11 shows several suppliers that received orders from local assemblers over short periods of time ranging from a few months to a few years (T1, V13, V14, and V19). This table also indicates that the majority of suppliers

Table II-11. Suppliers' Dependence on Local Assemblers

Supplier	Entry into V-C chain	Types of Components	Ranking by Turnover		Transactions with Case Assemblers						Number of Customers, Patterns of Dependence	
			2002	2006	A1	A2	A3	A4	A5	A6	Stage II	Stage III
Suppliers that expanded transactions with Group 1 assemblers in Stage III												
V16	2000	Silencers	not included	53rd	X		X			X	Traded with 30 local assemblers in 2002, accounting for 80-90% of the local sales.	Traded with 20 local assemblers in 2008, accounting for 50% of the total sales. 2006 was the peak year. A1, A3, A6 among five largest customers.
V20	1997	Silencers	27th	116th	X		X			X	Traded with a total of 46 companies between 1997 and 2008. As of 2008, had 3 customers, accounting for 10% of sales.	
V21	2004	Shock absorbers	not included	not included	X			X		X	(Not yet established)	Traded with 10 local assemblers in 2009, accounting for 95% of sales. During the peak year, had 50 customers.
C1	2001	Plastic covers, frames, lights	not included	6th & 38th	X		X	X	X	X	(n/a)	Traded with 43 local assemblers in 2007. A1 largest.
C2	2002	Clutches	not included	24th	X					X	Traded with 24 companies in 2004, accounting for 50% of sales. A1 and A6 among largest.	Sales to local assemblers accounting for 56% of sales (number of local assemblers unknown). A1 among largest.
C3	2002	Frames	not included	62nd			X				(n/a)	Traded with 19 local assemblers in 2008. A3 largest. No products/customers other than motorcycle components/local assemblers.
C4	2003	Electric components	not included	60th				X		X	Traded with 30 assemblers in 2004. A4 and A6 among largest.	Traded with 50 assemblers in 2008.
Suppliers that had shifted from Vietnamese─Chinese chains to Japanese chains by Stage III												
T1	1999	Stamped components	not included	9th &11th			(n/a)				Traded with local assemblers only during 1999─2001.	No transactions with local assemblers in 2007.
T2	1998	Shock absorbers	not included	17th			(n/a)				(n/a)	Traded with more 10 local assemblers in 2007, accounting for 25% of sales.

Table II-11. Continued

Supplier	Entry into V-C chain	Types of Components	Ranking by Turnover		Transactions with Case Assemblers						Number of Customers, Patterns of Dependence	
			2002	2006	A1	A2	A3	A4	A5	A6	Stage II	Stage III
T3	1997	Electric components	not included	21st	X		X			X	(n/a)	Traded with 16 local assemblers in 2005, accounting for 10% of sales. Only A6 placed regular orders in 2009.
T4	2004	Electric components	not included	25th	(n/a)						Expanded sales to local assemblers in 2002─2003. Accounted for one-third of sales in 2004.	Traded with 4 local assemblers in 2008, accounting for less than 1% of sales.
T5	2000	Silencers	not included	33rd						X	Traded with local assemblers only during 2000─2004. Accounted for less than 5% of the total sales. A6 among the main customer.	(n/a)
K1	1999	Switches	9th	46th			X		X	X	Traded with local assemblers in 2004, accounting for 50% of sales. Six relatively large customers.	Traded with 10 local assemblers in 2008, accounting for 5% of sales. A6 among main customers.
V13	2000	Bearings	not included	45th	X	X					Traded with local assemblers only during 2000─2003, accounting for 20-30% of sales.	No transactions with local assemblers in 2008.
V14	2003	Engine components	not included	not included	(no transactions with any of the six assemblers)						Traded with 3 local assemblers only in 2003, accounting for 10% of sales.	No transactions with local assemblers.
V15	2001	Aluminium die-cast components	not included	not included	(no transactions with any of the six assemblers)						(n/a)	Traded with 5 local assemblers in 2008, accounting for 20% of sales. Maintained long-term transactions with 5 customers.
V17	2001	Clutches	not included	not included	X			X	X		Traded with very large number of customers in 2001, accounting for 100% of sales. A1, A4, and A5 among main customers.	No transactions with local assemblers in 2008.
Suppliers that had shifted from Vietnamese─Chinese chains to other products/industries by Stage III												
V18	1997	Steel components	20th	not included	(n/a)						Traded with a total of 36 companies between 1997 and 2006, accounting for 100% of sales.	

Table II-11. Continued

Supplier	Entry into V-C chain	Types of Components	Ranking by Turnover		Transactions with Case Assemblers						Number of Customers, Patterns of Dependence	
			2002	2006	A1	A2	A3	A4	A5	A6	Stage II	Stage III
V19	1999	Engine components	not included	98th	X			X			Traded with 10 assemblers in 2002, accounting for 60% of sales.	The number of customers reduced to 2-3. Share of local assemblers in total sales 5-7% in 2008.
V22	2000	Chains	not included	not included	X						Traded with two local assemblers in 2000–1, accounting for 50% of sales.	Traded with 10 local assemblers in 2009, accounting for 30% of sales.
V23	2002	Wire harnesses	51st	not included	X						Traded with 12 local assemblers in 2004, accounting for 20% of sales. No main customer could be identified. 2002 was peak year.	No transactions with local assemblers in 2008.
Suppliers for which developments after Stage III is unknown												
T6	2001	Hubs	6th	not included			(n/a)				Traded with very large number of customers in 2004, accounting for 42% of sales. Neither total number of customers nor main customers could be identified.	(n/a)
T7	(n/a)	Chains	not included	66th					X		(n/a)	Traded with 30 local assemblers in 2005, accounting for 12% of sales.
C5	2002	Plastic covers	not included	133rd			(n/a)				Traded with 10 local assemblers in 2004.	(n/a)

Notes:
1) Nationality of suppliers can be identified by initial letters of supplier codes as follows: C = Chinese; T = Taiwanese; K = Korean; V = Vietnamese.
2) ‘Ranking by turnover’ indicates placement of respective suppliers among all registered motorcycle component suppliers included in the lists provided by the General Statistics Office.
3) ‘Not included’ indicates that the supplier was omitted from the list, which typically occurred when suppliers were registered under other industries because their main product lines were not motorcycle components.
4) ‘Transactions with case assemblers’ indicate whether the respective supplier conducted business with the respective assembler at any time.

Source: The author’s surveys and interviews.

simultaneously traded with a large number of assemblers. Suppliers V16, V17, V20, K1, and T6 specifically emphasised that they had no main customer even though they traded with some of the largest local assemblers.

In summary, the Vietnamese–Chinese chain consisted of a large number of assemblers and a fairly large number of suppliers, both of which were small in scale and possessed limited capabilities. Inter-firm relations were fluid and none of them exercised power over others.

6.1.3 Arm's-Length Linkages in Need of Coordination

The discussion in Section 6.1.1 showed that although standardised and simple parameters prevailed in the Vietnamese–Chinese chain, the requirement for explicit coordination was not eliminated entirely. Specifically, the following two types of coordination requirement remained:

- Coordination needs around product parameters remained to the extent that de facto standardisation only partially ensured component compatibility.
- Low quality requirements notwithstanding, even lower levels of supplier manufacturing competence resulted in coordination needs around process parameters.

The following examines how assemblers and their suppliers coped with these coordination needs via in-depth examination of the three assemblers for which detailed data could be obtained: A1, A2 and A4.

Some assemblers opted for vertical integration. Assemblers A1 and A4 conducted in-house manufacturing of components in cooperation with Chinese and Taiwanese partners respectively. Although investment in in-house manufacturing was often made in response to the government policy (see Section 2.3), the fact that it was a costly option for those with small production capacity notwithstanding, these assemblers explicitly noted the advantages of the practice. In this regard, assembler A4 noted:

> We want to produce low-price but good-quality motorcycles for [our] customers. Therefore, we face many difficulties in sourcing components locally – the quality is not stable. So, we need to produce some components even though it is not efficient and drives up costs. (A4 #1)

Asked to compare sourcing components from China, sourcing locally, and manufacturing them in-house, a manager of assembler A1 responded:

> Manufacturing components in-house is the best option – in terms of advantages in both cost and quality. The key is that we endeavour to increase the quality of our products. (A1 #1)

Implicit in the above comment is that this company saw no possibility of implementing mechanisms for imposing its quality requirements on external suppliers.

However, even with these assemblers, in-house manufacturing was typically limited to a few types of component only. In the main, lead firms engaged in arm's-length transactions with their suppliers in the sourcing of the majority of components.

First, two assemblers interviewed by the author (A2 and A4) explicitly noted that they adopted a trial-and error approach, switching suppliers whenever they found one to be unsatisfactory. This is evident from remarks made by the former procurement manager of assembler A2, the largest assembler in 2000:

> Back in the early years [2000–2001], the number of suppliers was limited and thus it was difficult to switch suppliers. However, we still tried different suppliers in

> search of those that were stable – in terms of quality, payment, prices and delivery. (A2 #1)

Second, a lack of explicit governance is also evident from the ordering procedure.[82] Given the very small scale of production, local assemblers placed orders on an ad hoc basis.[83] Transactions typically began with the assembler providing the supplier with either a sample for replication or very simple component specifications (e.g. type of component, type of base model, and/or colour). The supplier then provided the lead firm with a sample together with a price quotation. If the lead firm accepted both the sample and the price, the two parties signed a 'basic contract', which normally lasted for a year but did not bind the assembler in terms of either volume or frequency of orders.

Clearly, arm's-length transactions of the sort discussed above failed to provide solutions to coordination needs around product and process parameters. However, although the problem of low quality could simply be left unresolved, the lack of component compatibility posed a serious problem because assemblers were often faced with components that could not be assembled. 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 often asked by customers to modify components once delivered as they were incompatible with adjacent parts (interviews with V13 #1; V15 #2; K1 #2). Nevertheless, such piecemeal modifications fell short of full component compatibility, leading to products that were inferior in quality and performance to original models.

In short, limited lead firm and supplier capabilities resulted in a situation in which

[82] Unless otherwise noted, the description of ordering procedure in this paragraph is based on interviews with assemblers A2 #1; A4 #4 and suppliers V13 #1; V15 #2; V17 #1; V19 #2; V23 #1; T6 #1; T7 #1.

[83] Even in assembler A2, which recorded the largest turnover in 2000, the average size of each order was only 100–200 units (interview #1).

coordination issues arising from the shortcomings of de facto standardisation were left unattended. Market-based transactions characterised by ad hoc coordination achieved low prices but at the expense of low quality.

6.2 Stage III: Emergence of Coordination from Below

This section analyses the responses of local assemblers to fresh challenges in a new stage of industrial development: the rapid growth of foreign motorcycle manufacturers combined with increasing sophistication of market demand. Since the sector began to take a concentrated structure, the analysis starts by briefly discussing the overall structure of the industry and then proceeds to detailed analyses of a limited number of the largest assemblers and their key suppliers.

6.2.1 Meeting the Japanese Challenge: Two Contrasting Approaches

As the new stage of industrial development commenced, local assemblers were faced with fresh challenges. First, HVN's penetration of the middle-income market now posed a real threat as it actively invested in production capacity expansion after 2005 (Section 5.3.2). Second, the upward shift in consumers' preferences discussed in Section 5.3.1 put pressure on local assemblers to increase the quality of their products. Having experienced serious quality issues with Chinese motorcycles, Vietnamese consumers were no longer willing to accept low prices at the expense of poor quality.

Local assemblers responded to the new challenges with two distinct approaches.[84] One group of assemblers focussed on producing a larger variety of models carrying imitated

[84] This finding was initially derived from the author's in-depth analysis of a small number of assemblers (Fujita 2006) but it was corroborated by interviews with suppliers operating in the Vietnamese–Chinese chain, particularly C1 #2, #3; K1 #3; T3 #2; V16 #2; and V21 #1.

designs at low costs, targeting the low-income rural market that the Japanese manufacturers had not penetrated. Another group of assemblers prioritised the improvement of product quality, developing own product designs and/or brand names, even if this should be at the expense of higher prices.

The two contrasting approaches can be observed in the embedded cases of the five assemblers for which detailed data are available for Stage III (Table II-9). Assemblers A1 and A3 belong to the former category. They are similar in that they kept product and process parameters simple and standardised, specifying few requirements beyond price level. A number of suppliers explicitly noted that assemblers in this category – A1 in particular – specified limited quality requirement (C1 #2, #3; V16 #2; V21 #1). The low prices of their products are also an indication that their target was low-income consumers. As Table II-9 shows, the average price of these assemblers' products in 2007 was less than half that of the Wave Alpha, US$801.

These assemblers continued to capitalise on Japanese designs as de facto benchmarks. However, unlike the case in Stage II, these assemblers started to make minor (largely cosmetic) modifications to several key components. Alterations to plastic covers and frames, which affected the external appearance of the motorcycle, were of particular importance (interviews with assembler A4 #4; supplier C1 #2, #3).

The above approach to the modification of de facto standard models enabled these assemblers to achieve a remarkable expansion of product variety, as well as speed and flexibility in launching new models. This is most clearly observed in assemblers A1 and A3. Table II-8 shows that the number of new models registered by these assemblers increased rapidly after 2005. By this stage, assemblers exploited not only Honda's two most popular motorcycles but also a much larger range of Japanese models – including new ones launched after 2005 – as de facto standards for duplicative imitation (interviews with supplier C1 #2, #3). Moreover, they launched a large number of new products by mixing and matching components with minor modifications (interviews with suppliers C1 #3; K1 #2, #3). Supplier K1, which simultaneously traded with HVN and local assemblers, described the strength of this group of assemblers as the flexibility and speed with which they were able to adjust product strategy:

> [They] are sensitive to market information. They try to obtain information on Honda's future models using their connections with the Ministry of Industry, and replicate these products in advance. To cope with the regulations on intellectual property, they combine different types of components. Honda cannot change its product strategy quickly, but [local assemblers] can change [product strategy] within a week. (K1 #2)

Assemblers A5 and A6 belonged to the latter category of assemblers. Unlike those in the other group, notable changes were observed in their products. The complexity of product and process parameters increased as these assemblers attached priority to quality. Suppliers to these assemblers noted that – although by no means on the scale exacted by Japanese manufacturers – they were more demanding in terms of quality, for which they were willing sacrifice economy of price (interviews with C1 #2; T3 #2; V21 #1). Accordingly, the average prices of their products were higher than those of the assemblers in the former category (Table II-9). Product parameters also grew less standardised as these assemblers sought to develop their own designs and brands.[85] Assembler A6 in particular had adopted customised designs for some of its models by 2007, for the manufacture of which suppliers were provided with design drawings together with samples (interviews with assembler A6 #1 and A6's supplier, T3 #2).

[85] Institute for Industry Policy and Strategy (2007: 39) also notes A5 and A6 are among those assemblers that invest in own-product designs and brands.

Assembler A4 fell between the two categories, in that it did not opt to develop own-product designs or brands and kept product parameters standardised. However, the company did seek to increase the quality of its products, resulting in higher prices than those of assemblers A1 and A3 (interview with A4 #4).

In short, two discrete groups of local assemblers emerged in Stage III, each of which adopted a different product strategy. Yet, the question remains as to which of the two came to represent the dominant actor within the industry. This puzzle is addressed in the next subsection.

6.2.2 Consolidation of Assemblers and Rise of Supplier Capabilities

In Stage III, the local assembly sector of the Vietnamese motorcycle industry was substantially restructured, assemblers being consolidated into a small number of large companies. By 2006, the number of active local assemblers had been reduced to 28, roughly half that of 2000.[86] Accordingly, the market grew more compact, and it was those assemblers that concentrated on price-based competiveness (the first group discussed above) that captured the bulk of the sales share. As Table II-9 shows, the largest assembler (A1) accounted for 23% of the total turnover of local assemblers in 2006, and the four largest firms (inclusive of assemblers A1 and A3) together enjoyed a 50% share.[87] In contrast, assemblers that focussed on non-price-based competitiveness (the second group discussed above) accounted for a much smaller market share.

However, there was little indication that either group of assemblers had amassed new capabilities. Those in the second category developed their own products by mobilising

86 Based on a list of motorcycle assemblers operational in 2006 provided by the General Statistics Office.
87 Based on a list of motorcycle assemblers operational in 2006 provided by the General Statistics Office.

external capabilities rather than building their own internal capabilities: A5 collaborated with Chinese partners (questionnaire survey in 2007), while A6 outsourced product design to overseas companies (interview #1).

Consolidation progressed on the suppliers' side as well. As local content rules were relaxed in 2003, local assemblers as a whole began to depend increasingly on imported components (Table II-12), relying on local sourcing only when parts were available at competitive prices. Table II-11 classifies suppliers in the Vietnamese–Chinese chain according to their positions in Stage III. Of those interviewed by the author, several quickly expanded sales to local assemblers, the largest firms in particular such as A1 and A3 (V16, C1, C2, C3, and C4). At the same time, the remaining suppliers faced diminishing sales to local assemblers, and they either shifted to the Japanese chain or other industries.

Table II-12. Value of Imported Components per Vehicle Sold (Unit: US$)

	2000	2001	2002	2003	2004	2005
HVN	692	641	275	231	203	218
Local Assemblers	506	338	181	179	420	396

Source: The author, based on data provided in Institute for Industry Policy and Strategy (2007).

What is striking is the size of turnover and the number of customers the first group of suppliers served at this stage. Supplier C1 had two factories registered as independent companies, which in 2006 ranked as 6th and 38th respectively in terms of turnover of all operational motorcycle component manufacturers in Vietnam, including the largest Japanese suppliers that served 100% of HVN's growing orders. In 2007, this supplier sold over 860,000 units of plastic covers and frames (interview with C1 #1), which more or less accounts for the total number of motorcycles produced by local assemblers in that year (Figure II-1). Moreover, these suppliers simultaneously served 20 to 50 local assemblers in Stage III (Table II-11), which was in fact more than the aforementioned number of officially registered local assemblers in 2006.[88]

Suppliers expanding their sales to local assemblers are particularly notable for the extent to which they built design and manufacturing capabilities. Moreover, unlike suppliers under the Japanese model, the accretion of new capabilities in the Vietnamese–Chinese chain was achieved primarily through suppliers' *independent* volition rather than as the result of explicit demand from or assistance of lead firms. As the most prominent example, C1 had invested in generic manufacturing competencies in order to achieve reasonable quality, prompt delivery, and low prices, whilst mobilising the capability of the company's R&D centre in China to reverse-engineer existing component designs and conduct minor cosmetic modifications (interview #1). The ability to conduct large-scale manufacturing to reasonable quality standards was developed by importing equipment and machinery from China and mobilising Chinese engineers (ibid.). The huge production volume also enabled the company to exploit economies of scale.

Likewise, V16, a Vietnamese supplier of silencers, was one of the few local suppliers continuing to operate in the Vietnamese–Chinese chain in Stage III. This firm was the only local supplier subjected to in-depth analysis by this study that had acquired an *adaptive* or basic innovative level of new product introduction capability (Table II-10). Whereas it had replicated existing products in the 1990s, it subsequently gradually started to make cosmetic and functional modifications to standardised designs (interviews #1, #2). This was achieved through its own R&D efforts and attempts to engage with assemblers. The supplier independently established an R&D department, investing in design equipment, software, and testing and measuring equipment, as well as training its own design engineers (interview #1).

[88] This is likely to be because some assemblers had shifted their focus to other lines of business where they were officially registered, yet continued to produce motorcycles on a small scale.

In short, the local motorcycle assembly sector was consolidated into those assemblers that focussed on price-based competitiveness in standardised models with minor external modifications. Consolidation also progressed on the suppliers' side, which resulted in the rise of those with manufacturing and design competencies.

6.2.3 The Rise of Supplier-Driven Coordination

The result of the rapid consolidation of lead firms and suppliers amounted to de facto mutual dependence between large assemblers and large, competent suppliers. The results of questionnaire surveys conducted in 2007 show that assemblers A1, A3, A4, A5 and A6 developed relatively long-term relations with a limited number of key suppliers that extended for between three and six years, suggesting that the relations between lead firms and suppliers had stabilised.

However, this does not imply Japanese-type organisation in which lead firms and suppliers are locked into particular relations. Assemblers expressed strong preference to avoid dependence on specific suppliers. Table II-13 shows that all of five assemblers under study cited the optimum number of suppliers for each type of component as two to three in order that they should not be dependent on specific firms. Remarkably, no major differences were observed between the two groups of assemblers. Neither were suppliers locked into relations with specific customers, a finding that is clearly illustrated by the large number served by suppliers surviving to Stage III (Table II-11).

Thus far, it has become clear that the local motorcycle assembly sector came to be dominated by a small number of large assemblers producing low-priced, standardised models with minor external modifications. While their success is plausible given that they catered to the extreme low-end section of the Vietnamese market that even HVN's budget model had not penetrated, the question remains as to how they managed to resolve coordination issues around product and process parameters. First, the limits of de facto standardisation – as discussed at length in Section 6.1 – remained in place. These assemblers should have been able to achieve at least reasonable quality levels since their target consumers were no longer willing to accept low quality just because the products were cheap. Second, the assemblers were able to make minor modifications to original Japanese component designs, a factor that compounded coordination requirements. The question is therefore one of how firms met the necessary level of coordination.

Table II-13. Assemblers' Preferred Number of Suppliers of Each Component

	Number of suppliers*	Reason
A1	2–3	Competition based on quality and price is beneficial
A3	2–3	Allows the assembler to take the initiative.
A4	2–3	Allows suppliers to compete based on quality and price.
A5	2–3	Allows the selection of suppliers based on price, quality and delivery.
A6	2–3	Avoids passivity and defensiveness.

Note: * Assemblers were asked to choose between one, two to three, or more than three.
Source: The author's questionnaire survey conducted in 2007 in collaboration with the Vietnam Institute of Economics, Vietnam Academy of Social Science.

This question was explored via in-depth analyses of the embedded cases assemblers A1 and A3, and their largest suppliers. The findings suggest that it was the suppliers rather than the assemblers that took the lead in dealing with coordination issues. By dealing systematically with non-compatibility problems arising from de facto standardisation and making modifications to component designs on behalf of their customers, these suppliers became the key force driving the transformation of the Vietnamese–Chinese chain.

Such supplier-driven changes are demonstrated by the in-depth analysis of suppliers C1 and V16 discussed above. C1 rapidly expanded sales to local assemblers by utilising design competencies and generic large-scale manufacturing capacity to provide the complete, fine-tuned component modules that were most critical to the assemblers; incorporating minor cosmetic modifications, and processing them to reasonable quality, prompt delivery, and low cost standards. Although the supplier produced a large variety of motorcycle components, it focussed most sharply on plastic covers, frames and lights (interview #2). This is because local assemblers attached the highest importance to these component modules in terms of product differentiation, meaning that their manufacture called for exacting design work given that they essentially determined the external appearance of the whole vehicle.[89] Each year, C1 launched an average of four designs incorporating minor modifications to these most necessary modules (interview #1). The three types of component that comprised the modules were fine-tuned with each other in order to maximise the performance of the module as a whole. Moreover, unlike the ad hoc, ex post adjustments typically observed in Stage II, supplier C1 systematically adjusted the interfaces of these modules with adjacent components at the initial stages of contact with assemblers (interview #2).

V16 provides another case in point. Its main products, silencers, were critical to local assemblers because they affected both the product's performance and its external appearance. This supplier continued to operate in the Vietnamese–Chinese chain in Stage III as it made effective use of its design and manufacturing capabilities to conduct minor cosmetic and/or functional modifications to the existing designs of this important component on behalf of its customers, because "local assemblers did not have design drawings and did not know anything about technical parameters" (interview #1). Based on surveys of local assemblers, motorcycle dealers, and final consumers, V16 regularly

[89] Interviews with supplier C1 #3 and assembler A4 #4. Ge and Fujimoto (2005: 98–9) note that this was also the case in China.

launched new designs which reflected the latest market trends and policy requirements and carried the company's own brand name (interviews #1, #2).

In contrast, there was little indication that the sourcing practices of assemblers A1 and A3 were substantially different from those that had prevailed in Stage II, which suggested that the impetus for organisational innovation did not come from lead firms. Apart from the fact that their relations with key component suppliers had stabilised and been sustained over the long term, there was no evidence that the procedure for placing orders had changed in comparison to the previous stage as described in Section 6.1. Suppliers that continued to trade with either assembler A1 or A3 in Stage III, namely, C1, V16 and V21, noted that the manner in which these assemblers specified and monitored component quality and precision levels remained unchanged (interviews with C1 #2; V16 #2; V21 #1). None of these suppliers were provided active monitoring by assemblers A1 or A3, as noted by supplier C1:

> As for assemblers like A1 and A3, because the size of their orders is very large, they do not check the quality of the components carefully. Their complaints mostly concern wrong colours. (C1 #2)

The result of these supplier-driven changes was 'coordination from below', which addressed those coordination issues arising from the limitations of de facto standardisation without assemblers or suppliers being locked into particular relations or having to engage in intense communication. With the ability to conduct reverse engineering, design modification, and large-scale manufacturing, the two suppliers discussed in detail above together with several others formed a "shared supply base" (Sturgeon and Lee 2005) for local assemblers as a whole, including major assemblers such as A1 and A3 as well as other firms operating on a smaller scale.

Although the above features of this emerging industrial organisation apparently resembled a modular chain (Sturgeon 2002; Gereffi et al. 2005), the coordination pattern emerging in Stage III of the Vietnamese motorcycle industry should be distinguished from such a chain because: (1) de facto standardisation was partial in that it did not do away with coordination requirements; and (2) standardisation did not extend to the whole vehicle. Because of this partiality, suppliers C1 and V16 still had to adjust component interfaces for each of their customers, although they managed to reduce the time and cost of modifications by implementing them systematically.

Nevertheless, albeit partial, supplier-driven coordination was the form of organisational adaptation best suited to the market conditions and capability alignment prevailing in Vietnam at the time. For suppliers, exploiting de facto standardisation to serve numerous customers made economic sense because in Vietnam's fragmented market, pooling orders from multiple assemblers was the only way to achieve sufficient economies of scale (Fujita 2011). For assemblers who lacked both design and manufacturing competencies, relying on competent suppliers was the easiest and fastest route to solving the immediate problems of non-compatibility; increasing product variety by achieving cosmetic modifications to several key components; and exploiting the cost advantage of large-scale production.

6.3 Summary and Discussion

This section analysed the emergence and transformation of the Chinese model in Vietnam. In respect of the first sub-question concerning the trajectory of organisational transformation, the findings presented in this section did not render support to the argument of the empirical research to date, which has focussed on a small number of assemblers operational up to Stage II to argue that they started to develop long-term, trust-based relations with their suppliers.

Conversely, the foregoing analysis showed that in Stage III several powerful suppliers took the lead in addressing coordination needs on behalf of their customers without lead firms or suppliers having to engage in intense communication or being locked into particular relations. This suggests that even assuming a lead firm-driven shift towards trust-based relations had obtained among a certain group of assemblers in Stage II, it was still likely to be a transitory. The limited knowledge of products and production processes possessed by local assemblers also suggests that such networks even if they had existed were unlikely to have been sustainable. The research design adopted in this paper was critical in showing the overriding trend of organisational transformation in this sector of the Vietnamese motorcycle industry; that is, empirical research based on the integration of industry-level and firm-level data facilitated the analysis of changes in the operations of both lead firms and suppliers over an extended period of time.

With regard to the second sub-question concerning the determinants of organisational transformation, it was argued that the product characteristics emphasised in the existing literature are in themselves insufficient to explain the phenomenon. De facto standardisation of Japanese models and low quality requirements reveal why arm’s-length linkages prevailed in the early 2000s but do not account for the emergence of supplier-driven coordination in Stage III.

The empirical findings showed that the driver for change came primarily from the rise of supplier competencies. This was in sharp contrast to the Japanese chain, in which the lead firm actively sought to realign the capability structure to create conditions conducive to the effective functioning of its organisational adjustment. By independently accumulating complementary competencies in conducting minor design modifications to existing models and manufacturing them in large quantities to reasonable standards, a small number of suppliers – including those analysed in depth as embedded case studies – formed a shared supply base for large and small assemblers seeking to increase the product variety of low-priced, standardised models aimed at the low-income market still unexploited by HVN.

7. Conclusion

This paper began by highlighting the challenges that the newly emerging Chinese model of industrial organisation posed to the conventional Japanese model. What can we learn from the rivalry between these two models in a third country context? How does its analysis contribute to the literature on models and trajectories of industrial organisation? By integrating extensive primary and secondary data collected at different points in time, this paper sought to describe and explain the decade-long organisational transformation in the Vietnamese motorcycle industry resulting from the direct clash of two contrasting models of industrial organisation. This concluding section summarises the empirical findings corresponding to the two sub-questions, and discusses the contribution of this paper to the wider body of literature on industrial organisation.

First, this paper asked a ‘how’ question on the dynamic evolution of industrial organisation in the Vietnamese motorcycle industry: *How did the Japanese and Chinese organisational models evolve in Vietnam?* The literature suggests that these two models converged; however, the present study found that such convergence was short-lived. What seemed like important changes in both Japanese and Chinese models in the early 2000s were eventually abandoned, while more dynamic, long-lasting changes got underway at a later stage of industrial development. In the end, the Japanese model shifted from one variant to another variant of the same captive model of industrial organisation. The Chinese model essentially remained one of loosely coordinated organisation throughout the period of analysis; although it came to be characterised by several competent suppliers playing partial yet critical coordinating roles in later years. Fundamental differences between the two models continued to persist in the medium term.

Second, this study examined the reasons for these organisational changes; that is, *what factors drove the organisational transformation of the Vietnamese motorcycle industry?* The literature emphasises the nature of the product that respective lead firms manufactured. Yet, the longitudinal analysis in the present paper found that explaining short- and medium-term trajectories of organisational transformation required another variable – that of the changing capability alignment in the respective value chains.

The transformation of the Japanese model into an institutionalised competition variant can be explained in terms of changing capability alignment in *both* the lead firm and its suppliers, that is, lead firm acquisition of purchasing power and increasing supplier capabilities but not complementary competencies. It was HVN that took the lead in nurturing the necessary capabilities – not only its own but also those of its suppliers – although it took time and the dismantling of policy constraints before such initiatives started to produce the desired results. Conversely, the transformation of the Chinese model can be explained primarily in terms of the formation of supplier capabilities, that is, the rise of specialist suppliers with design modification and large-scale manufacturing competencies.

In addition to empirical findings specific to the Vietnamese motorcycle industry, this paper also makes an important contribution to the broader body of literature. First, by systematically tracing the long-term transformation of two industrial organisational models, this paper shed new light on the processes through which organisations evolve over time. The empirical findings showed that organisational transformation was far from a smooth and automatic process. In practice, such processes involved challenges, struggles and tensions. The results were diverse hybrids or intermediate forms of industrial organisation that did not necessarily correspond to the five most typical governance forms. The empirical findings indicate that the captive model – the conventional form of Japanese industrial organisation – can in practice be implemented as two distinct variants, each with strikingly different implications for competitiveness and supplier development. 'Coordination from below' in the Vietnamese–Chinese chain is another example of a hybrid form of organisation. Albeit partial, this provided effective means for local assemblers and suppliers to meet Japanese challenges under the conditions prevailing in Vietnam.

Second, this study systematically explained the trajectories of organisational change in terms of two elaborate and operational variables: the nature of product/process parameters and the alignment of relevant capabilities. While much of the previous theoretical and empirical research has focussed on chain governance in its most orthodox forms, these patterns emerge only where specific combinations of these two variables are present. Where models are transferred to different contexts or where they meet new competitive challenges, there may be many instances in which ideal sets of conditions for intended organisational adaptation are unavailable. It is indeed such misalignments of variables that created the aforementioned challenges, struggles and tensions.

Indeed, contrary to Gibbon et al.'s (2008) contention, the two variables did not transpire to be structural constraints to transactions. These variables were heavily influenced by the strategic actions of firms in the value chain, and it was in fact such actions of lead firms and/or suppliers aimed at realigning these variables – albeit with limitations – that drove industrial organisation to full or partial transformation. HVN made active attempts to realign the capability structure in order to create the necessary conditions for the effective functioning of the market forces it sought to introduce. In Vietnamese–Chinese chains, coordination needs arising from the partial nature of de facto standardisation were simply left unattended in the early years because none of the actors had the capacity to deal with them. These needs were eventually met by the rise of competent suppliers that had both the will and the capacity to play a partial yet critical role in implementing the requisite coordination.

Finally, the empirical findings of this study also provide important insights into the emerging rivalry between the Japanese and Chinese models of industrial organisation. In terms of its capacity to exploit the potential (unrealised) market demand and to capitalise on the existing alignment of relevant capabilities, the Vietnamese case demonstrates that the Chinese model initially proved more adaptable to developing country conditions. However, in the medium term, the Japanese model gained supremacy over the Chinese model as Japanese lead firms made certain – but not fundamental – adjustments to the nature of their products, while actively realigning the capability structure. Conversely, while the Chinese model lost supremacy in the medium term, it nevertheless continued to function in an adapted form as suppliers gained the complementary competencies required by local assemblers. The result of repeated rounds of organisational adaptation was enhanced organisational diversity. After a decade, the two models continued to exist side by side, both retaining the essential features of the original models yet incorporating important adjustment.

PAPER III. THE DYNAMICS OF LOCAL SUPPLIERS' CAPABILITY FORMATION IN THE VIETNAMESE MOTORCYCLE INDUSTRY

1. Introduction

A major challenge for developing countries seeking to build a competitive manufacturing sector lies in amassing a sizeable pool of competent suppliers of parts, components and accessories. Having a substantial domestic agglomeration of suppliers helps a developing country not only to increase the value added that accrues within the country but also attracts growing FDI, as agglomeration economies significantly influence location decisions of TNCs (UNCTAD 2001). However, satisfying demanding customers is not an easy task for firms in developing countries, and involves a process of continuous learning (Schmitz and Knorringa 2000; Schmitz 2006). Although GVC and TC research has provided critical insights into this process and its determinants, the following two interrelated research agendas remain underexplored in the existing literature.

First, the literature has failed to show how supplier learning evolves over time. To date, much of the empirical research on firm-level capability building has been based on short-term observation (Bell 2006), and this has particularly been the case with small-scale suppliers at the lower end of the technological trajectory. Indeed, this research has focussed primarily on showing the capability levels such firms reached at a particular point in time, or the learning progress they had made in the period immediately preceding a study. This has left largely unexplored the question of how developing country suppliers build capabilities over an extended period. Given that they typically undertake continuous learning in order to meet the demands of their customers, this is a serious omission.

Second, due to their failure to give balanced attention to the roles of key actors involved in supplier learning, the GVC and TC approaches have only reached partial understanding of the sources of such capability building. On the one hand, the GVC approach emphasises the roles of ‘lead firms’ that set and enforce the parameters for other actors operating in the value chain (Humphrey and Schmitz 2001). Much of the discussion has been directed at how this ‘chain governance’ provides upgrading opportunities for local firms (Humphrey and Schmitz 2004; Schmitz 2006); while the endogenous accumulation of suppliers’ internal resources has not been examined in depth (Morrison et al. 2008). On the other hand, the TC approach focuses on the ‘firm-internal’ accumulation of resources (Bell and Pavitt 1995), but has directed little attention to how this process is influenced by the nature of relations that suppliers develop with lead firms. It is in this light that Morrison et al. (2008) argue for the need to integrate the GVC and TC approaches in the study of mechanisms that link value chains with the learning and innovation of local firms. However, the fundamental questions of how this integration can actually be achieved and be applied in empirical research remain unexplored.

Vietnam’s motorcycle industry provides an excellent case for addressing these research gaps. First, the rapid development that this industry has undergone in a relatively short space of time makes it an ideal candidate for analysing processes of change. Launching the domestic production of motorcycles from scratch only in the late 1990s, Vietnam emerged as one of the world’s major motorcycle producers after China, India and Indonesia in only a decade (Paper II). The rapid growth of the industry prompted numerous local firms to enter into motorcycle component production and acquire basic production capabilities (Fujita 2007, 2011).

Second, the development of this industry was driven primarily by competition between two kinds of lead firm cultivating contrasting types of value chain (Paper II). The coexistence of two contrasting value chains makes this industry a particularly illuminating case for examining the roles of lead firms and suppliers in the capability building of the latter.

This paper uses the case of the Vietnamese motorcycle industry to address the two aforementioned underexplored research problems. Specifically, it addresses two empirical questions related to the dynamic evolution of supplier learning in the Vietnamese motorcycle industry. The first asks how supplier learning trajectories evolved over time. The focus is on the critical junctures in the process of capability building, which this paper refers to as 'learning events'.

> Question 1: *How did local suppliers' capability building evolve from the late 1990s? What functions and what levels of capability had they acquired by 2008? When did key learning events occur?*

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?*

Whilst these are empirical questions specific to the Vietnamese motorcycle industry, it is hoped that exploring them will go a long way to filling the two knowledge gaps in the literature on the trajectories and sources of capability building. Accordingly, this paper 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.

The remainder of the paper is organised as follows. Section 2 reviews the literature. Section 3 develops the conceptual framework and operationalises the key concepts. Section 4 discusses the methodology. Sections 5 to 7 present the empirical analysis. Section 5 addresses the first research question by tracking supplier learning trajectories using the event-based approach. Sections 6 and 7 turn the focus to the second research question. Section 6 outlines two contrasting models of supplier learning as they emerged in the early 2000s. Section 7 explains supplier learning trajectories in terms of adjustments that took place in the two learning models after 2005. The concluding section summarises the empirical findings and their contribution to the literature on supplier capability building.

2. Literature Review

This section reviews the existing literature related to the two main research questions and identifies research gaps. Sections 2.1 and 2.2 review the literature on the evolution of supplier learning trajectories and the sources of supplier learning respectively. Section 2.3 specifically reviews the empirical literature on the Vietnamese motorcycle industry in relation to these two issues.

2.1 Evolution of Supplier Learning Trajectories

Based on the evolutionary theory of technical change (Nelson and Winter 1982), the TC approach considers that technological changes are not generated simply by importing equipment embodying new technology but 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.

Numerous studies have elaborated different stages in the capability accumulation process and modelled them as sequential paths that firms are expected to follow.[90] 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, however, 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

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

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 in terms of small-scale developing country suppliers towards the bottom of the technological ladder. Previous empirical studies in this field have largely focussed 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 firms had 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 focussing 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, 2008b). 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 capability. Chitravas’ (2006) detailed analyses of learning mechanisms in 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 car makers, the launch of new products, or engaging 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 this suggests that one could arrive at very different interpretations depending on the timing of a study. This is corroborated by Bell (2006: 34), who discusses how two sets of empirical studies of 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 countries towards the bottom of the technological ladder. Therefore, longitudinal research is necessary to address this gap.

2.2 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: (1) *lead firms* are emphasised in the GVC approach (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). As previous research has found that public and private support organisations are still underdeveloped and have played limited roles in supporting innovation in Vietnam's motorcycle industry (Institute for Industry Policy and Strategy 2007), the key actors examined in the present study are lead firms and suppliers.

The vital role that lead firms play in shaping supplier learning is at the centre of the

GVC approach (Schmitz 2004, 2006). Central to this approach is the governance of the value chain, a concept that is employed to explore various patterns by which relationships between lead firms and suppliers are coordinated (Humphrey and Schmitz 2001; Schmitz 2004; Gereffi et al. 2005). Gereffi et al. (2005) classify the dominant patterns of governance into the following five types (in ascending order of explicit coordination): (1) market, (2) modular, (3) relational, (4) captive, and (5) hierarchical.

Much of the empirical research in this field has focussed on whether certain types of governance are associated with certain types of supplier ‘upgrading’, a concept closely related to innovation and capability building (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.[91] 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

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

(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 has been on R&D institutions, training organisations, machinery and input suppliers, or consultancy and information services, while explicit emphasis has not been put 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 developing country firms' learning and innovation: power relations around local firms; and the endogenous process of capability development. However, Morrison et al. (ibid.) do not elaborate how such integration could actually 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.

2.3 Local Suppliers' Capability Building in the Vietnamese Motorcycle Industry

The three-stage development of Vietnam's motorcycle industry since the late 1990s (Paper II, Table II-1) has been driven by repeated rounds of competition between Japanese and Vietnamese lead firms (Paper II). On the one hand, Japanese lead firms were global industry leaders producing high-quality models that carried lead firm proprietary designs. They developed 'Japanese chains' in which suppliers were subject to centralised control and extensive intervention from their lead firms. 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. However, the subsequent strengthening of import controls and local content rules by the Vietnamese government led these assemblers to expand local sourcing and in-house manufacturing of components, often in cooperation with Chinese companies. The value chains developed by these assemblers – referred to as 'Vietnamese–Chinese chains' – are characterised by arm's-length transactions with little explicit coordination.

The central concerns of this paper are two-fold: (1) how local suppliers' capability building trajectories evolved amidst repeated rounds of competition between two groups of lead firms; and (2) what knowledge sources were mobilised by local suppliers in building their capabilities. The emerging empirical research on this industry offers limited insight into these issues (Pham Truong Hoang and Shusa 2006; Pham Truong Hoang 2007; Nguyen Duc Tiep 2006, 2007; Tran Ngoc Ca 2009).

To start with, the majority of these studies suffer from the following limitations. First, with the exception of Pham Truong Hoang and Shusa (2006) and Pham Truong Hoang (2007), the existing empirical analyses only provide 'snapshots' of local suppliers' capabilities at given times. Second, most of these studies also suffer from a lack of analytical rigour. With the exception of Pham Truong Hoang (2007), none of the above authors adopt a systematic framework for classifying and assessing supplier capabilities. Moreover, virtually all of the aforementioned research including Pham Truong Hoang (2007) comprises case studies of a very limited number of suppliers without any clear explanation as to criteria for the selection of cases.

With regard to the first issue, Pham Truong Hoang (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, the author's formulation of empirical data suggests a trajectory that progressed steadily once suppliers had entered into the production networks of Japanese and/or local assemblers.[92]

A possible reason why the existing empirical literature pays limited attention to the evolution of supplier learning trajectories is that it focuses almost exclusively on Stage II of industrial development. 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 (Paper II). 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 (ibid.). 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 focussed on the role played by *one* of the two key actors: lead firms *or* suppliers. Pham Truong Hoang and Shusa (2006) and Pham Truong Hoang

[92] This is clearly shown in Figure 6.2 of Pham Truong Hoang (2007: 195).

(2007) describe learning in Japanese chains mainly as an outcome of knowledge transfer initiated by the lead firm. While Nguyen Duc Tiep (2006) and Tran Ngoc Ca (2009) discuss the determinants of learning from the supplier's perspective in a Japanese chain using the concepts of 'responsiveness' and 'readiness' respectively, notions that are neither clearly operationalised nor supported by hard empirical data. Meanwhile, Pham Truong Hoang (2007) and Tran Ngoc Ca (2009) describe supplier learning in Vietnamese–Chinese chains largely as a unilateral exercise. In any case, none of the existing studies explicitly discuss how sources of supplier learning change over time.

2.4 Summary

The foregoing review of the literature on suppliers' capability building in general and in the context of the Vietnamese motorcycle industry in particular identified two major research gaps. One 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 other research gap concerns the sources of supplier learning. Much of the existing literature has examined learning from either the supplier *or* the lead firm perspective. There have been few attempts to integrate the two perspectives and analyse the process of supplier learning along the lines suggested by Morrison et al. (2008). These are the knowledge gaps that the present study seeks to bridge.

3. Conceptual Framework and Operationalisation

This section presents the conceptual framework of the paper and operationalises the key concepts. Since analysing capability building trajectories requires a frame of reference to assess the nature and levels of capabilities at different points in time, this section 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.

3.1 Classification of Capability

For the purpose of analysing the evolution of 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:[93] the 'functions' they perform, and 'levels' reflecting "the depth or degrees of creative engagement with technology" (Bell 2007: 98).

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 (Suehiro 2008; Hayashi 1990); and the author's field research on motorcycle and component manufacturers in Japan, China, Thailand and Vietnam.

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[93] Another possible dimension for the classification of capability is by '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.

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 paper 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.[94] As opposed to activities typically undertaken by major developed country corporations such as market research, formulation of product concept, 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 to the original product designs to meet the requirements of the local market – the sorts of activities best categorised as new product introduction.

The latter functional category of production is divided into two subgroups: *equipment-related* capabilities and *production management* capabilities.[95] 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) ability to design and improve production processes; and (3) design and manufacture of dies and moulds.[96] 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).

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

[95] This distinction follows Sato and Fujita (2009), which draws on Suehiro (2008).

[96] 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 JETRO, SME Technical Assistance Center and JICA and held at Melia Hotel, Hanoi on 22 January 2007.

In respect of the classification of *levels*, this paper 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 chain. The idea of using such fine-tuned classifications as those adopted in some of the recent sector-specific empirical analyses[97] 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 a continuous learning process of 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).[98] 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 latecomer firms normally first import mature, standardised technology and

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

[98] 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".

subsequently move on to acquire more advanced technology (Kim 1997, 2004), knowledge-using capabilities are classified into two levels by degree of mastery: routine operation (*operational level*) and stable maintenance of continuous operation (*assimilative level*). 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 degree of innovativeness: making relatively minor short-term adaptations to the existing technology (*adaptive level*), and creating new technology for medium- to long-term utilisation (*innovative level*).

The above classification of capabilities results in the two-dimensional matrix presented in Table III-1. In the context of the Vietnamese motorcycle industry, the main focus is on how suppliers starting at the operational or pre-operational level mastered stable operation of the existing technology (equivalent of the assimilative level) and eventually acquired the ability to conduct basic innovation of the existing technology (i.e. adaptive level).

3.2 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 the existing activities in an improved manner.

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

Table III-1. Classification of Capabilities

Type of Capability	Level of Capability	New Product Introduction	Equipment-related (level of processing precision, process design, dies and moulds)	Production Management
Production Capability (Knowledge-using capability)	Operational	Replication of an existing/given product 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 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	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	The planning and designing of 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 Lall (1992); Bell and Pavitt (1995); Figueiredo (2008b); Kim (2004); Sato and Fujita (2009).

As suggested by the literature reviewed in Section 2.1, 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 lead firm requirements – which may or may not be communicated explicitly – that play this stimulating role.

In analysing supplier capability building trajectories, this paper 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 III-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, 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). It is assumed that an event takes place in the supplier's activities in one or more value chains.[99]

Figure III-1 exemplifies the capability building trajectory of a supplier in a given functional category of capability. The supplier experienced two major milestones (events A and B) 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).

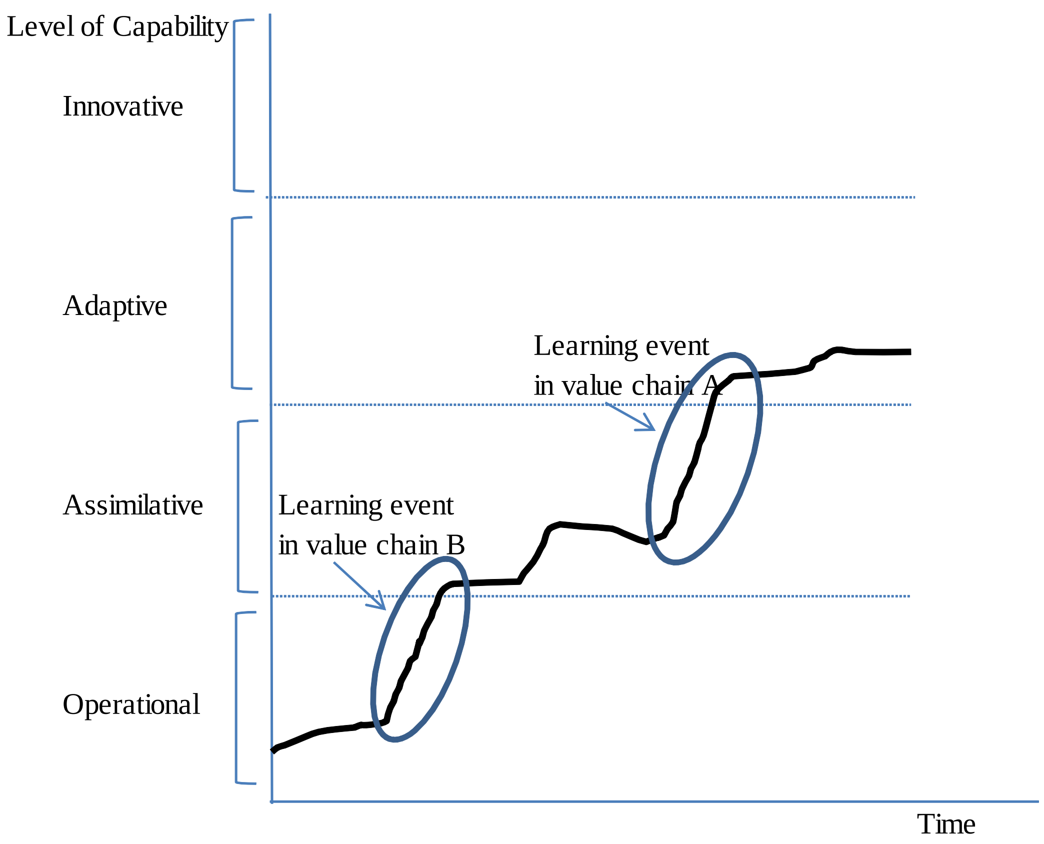
3.3 Sources of Supplier Learning

In order to develop a framework for analysing the sources of supplier learning, this paper 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 III-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 main stages in the lead firm–supplier transaction cycle: inducement, direct and indirect knowledge transfer, and monitoring.

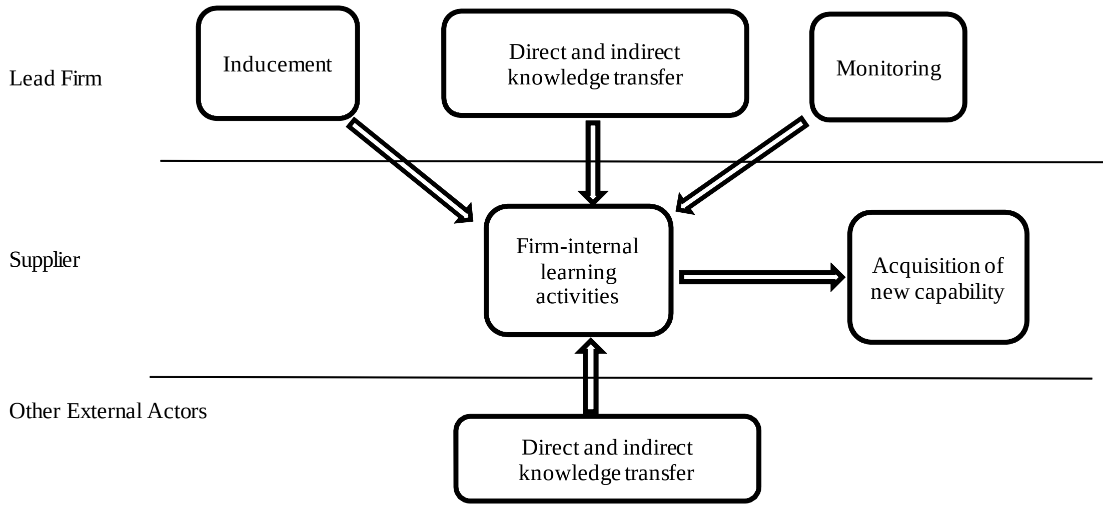
[99] It is also possible for learning to take place in the course of exploring a completely new market, in which case an event might not be associated with a specific value chain. However, such an occurrence was rarely observed among local motorcycle component suppliers in Vietnam. Unstable market and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

Figure III-1. Concept of Learning Events and Learning Trajectories



Source: The author.

Figure III-2. Model of Supplier Learning: Roles of Key Actors



Source: Fujita (2012: 116). Adapted from Schmitz (2006); Wong (1991, 1992); Mitsuhashi (2005); Ivarsson and Alvstam (2004, 2005); Ernst and Kim (2002); UNCTAD (2001).

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[100] 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).

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 activities (Bell and Pavitt 1995,

[100] Wong (1991) refers to this as 'spillover transfer'.

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, improvements in production procedures 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 2004; Malerba and Mani 2009). Intra-cluster sources may also constitute an important source of knowledge for small suppliers, such as the transfer of skilled labour among firms and the diffusion of know-how (Bell and Albu 1999).

4. Methodology

This section first introduces the overall methodological approach: retrospective case study. This is followed by discussion of the methods of selecting cases, and data collection and analysis.

4.1 Research Design: A Retrospective Case Study

This paper seeks to analyse motorcycle component supplier learning processes 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 in line with the conceptual framework presented in Section 3 that assumes learning trajectories to be heterogeneous.

4.2 Selection of Cases

While there is no ideal number of cases, it should be sufficiently large to enable the researcher to encompass a range of variation more or less representative of the sector (Eisenhardt 1989). Given the variety of factors assumed to influence supplier learning trajectories, in-depth examination of a very small number of suppliers (two to five), an approach adopted by most previous studies on the Vietnamese motorcycle industry (Pham Truong Hoang and Shusa 2006; Pham Truong Hoang 2007; Tran Ngoc Ca 2009), was considered to be inadequate. Rather, the author sought to cover a sufficiently large number of cases to shed light on the heterogeneity of learning trajectories among suppliers participating in different types of value chain 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: literal replication and theoretical replication (Patton 2002; Yin 2003; Eisenhardt 1989). 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 paper 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: first-tier suppliers in Japanese chains, second-tier suppliers in Japanese chains, and suppliers in Vietnamese–Chinese chains.

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 (i.e. state or private), timing of entry into a value chain, and types of components manufactured.[101]

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 2002, 2003, 2004, and/or 2005. 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)

[101] Ownership is significant because it often influences access to financial resources (Leung 2009). As discussed in detail in Section 7, a supplier’s membership of VEAM was also a key attribute in this respect.

became available; and (3) some suppliers previously interviewed either could not be contacted or refused to be interviewed.

Table III-2 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 5 suppliers that had initially participated in Vietnamese–Chinese chains but eventually entered a Japanese chain; and *Group C* consists of 5 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 III-2, that under the heading ‘year of business start-up’ may need elaboration. This ranged from 1959 to 2004, which means that the length of a given supplier’s operating 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 Vietnamese market-oriented reform 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

Table III-2. Suppliers Selected for Case Study

Group	Firm	Ownership	VEAM Member	Type of Component Processing	Number of Employees	Business start-up	Products/experience prior to entry into a motorcycle value chain	Value Chain Participation (1=1st tier; 2=2nd tier)							
								Stage I		Stage II			Stage III		
								J	Other	J	V–C	Other	J	V–C	Other
A	V1	State		Plastic	550	1972	Household products	1	1	1		1	1		1
	V2	State		Metal	1,350	1974	Bicycle components	1	1	1			1		
	V3	State		Metal	1,000	1974	Household products	1	1	1		1	1		
	V5	Private		Plastic	1,000	1988	Plastic packaging for export		1	1		1	1		1
	V6	Private		Assembly	500	1994	Wire harnesses for export to Japan		1	1		1	1		1
	V7	State	X	Metal	1,000	1968	Agricultural machinery and components		1	1		1	1		1
	V8	Private		Specialised	81	2004	Senior management and key engineers gained experience at a Japanese company	–		–			1		
	V9	State	X	Metal	1,100	1980	Diesel engines for domestic market		1	2		1	1		1
	V10	Private		Specialised	150	1988	Replacement components		1	2			2		1
	V11	Private		Plastic	182	1994	Household products and packaging		1	2			2		1
	V12	Private		Specialised	170	1999	Components of dies and moulds		1			1	2		1
B	V13	State	X	Metal	600	1974	Bearings for domestic market.		1		1	1	1		1
	V14	State	X	Metal	157	1970	Components for agricultural machinery		1		1	1	(1)*		1
	V15	Private		Metal	200	1986	Replacement components		1	2	1	1	2		1
	V16	Private		Metal	400	1981	Bicycle components		1	2	1	1	2	1	1
	V17	Private		Metal	150	2001	Trading motorcycles	–			1		2		1
C	V18	Private		Metal	150	1959	Bicycle components		1		1				1
	V19	Private		Metal	450	1987	Bicycle components		1		1				1
	V20	Private		Metal	170	1996	Replacement components		1		1			1	1
	V21	Private		Assembly	115	1988	Trading bicycles/motorcycles and components		1		1			1	
	V22	Private		Assembly	100	1999	Trading motorcycle components	–			1				1

Notes:

(1) 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 e.g. plating; assembly=suppliers producing components mainly as assembly processes without large investment in processing equipment.

(2) '–' denotes that the supplier was not established at the respective stage of industrial development.

(3) * 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.

Source: Fujita (2012: 119-120). Based on the author's interviews, complemented by company brochures, and websites.

specific Vietnamese context, this paper analyses capability building trajectories by the stages of industrial development since the mid-1990s outlined in Section 2 rather than by stages of suppliers' development.

4.3 Data Sources and 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 V6, V11, V12, V14, V18, V21 and V22 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 focussed on the collection of detailed data on each learning event.

In terms of 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.[102] Afterwards, the recordings were used to prepare transcriptions in Vietnamese.

[102] 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.

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.[103] 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.[104] If managers came up with 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 respect of more than one function. In cases of events associated with more than one lead firm, 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 to 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.

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

[104] 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 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 capability levels on the basis of the analytical framework.

(2) Interviews proceeded to questions concerning how the means of conducting new product introduction or production changed after the learning events 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 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.

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 with some cases 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, a 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 have otherwise 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.

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.[105]

The full list of interviews and interview schedule are provided in Appendices 1 and 2 respectively. Interviews cited in this paper are referred to by firm and interview codes as explained in Appendix 1.

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 events; types of value chain in which events took place; actors involved in events; and sources of knowledge mobilised in the process of events.

[105] JETRO (1996, 2001) are examples of such reports.

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.

5. Local Suppliers' Capability Building: Attainment and Trajectory

This section 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?

After a brief overview of learning events, the section analyses the functions and levels of capability acquired by suppliers. The section then looks at learning events in sequence and identifies the most critical junctures in decade-long learning trajectories.

5.1 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 V7, V8, V12, V17, V21 and V22. The reasons include a short history of operations after entry into a motorcycle value chain (V8 and V21); limited scope of activities (V8, V12, V17 and V22); and/or the fact that suppliers focussed on comparatively few major projects (V7). Some identified events were on-going as of 2008–09.[106] Of the 56 events, 44 occurred 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 sections 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 Section 5.2.

Table III-3 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 analysed in this paper.

[106] V9's third learning event – analysed in depth in Section 7.1.3 – is a typical example.

Table III-3. List of Learning Events

Supplier code/ Event #	Event Title	Stage of Industrial Development	Type of Value Chain		Type of Capability Acquired
			Main	Secondary	
V1-1	Improved processing and production management to obtain contract to supply simple plastic components to HVN and VMEP	I	HVN-1	Other	Eq/PM
V1-2	Developed and instituted company-wide management system for improved QCD performance and to obtain ISO 9001 certification	III	HVN-1	Other	PM
V1-3	Upgraded capacity to design and manufacture plastic moulds of higher precision; obtained HVN recognition as supplier of plastic moulds	III	HVN-1	Other	Eq
V2-1	Improved processing and production management for obtaining contract to supply chain cases to HVN	I	HVN-1	–	Eq/PM
V2-2	Improved processing and process design for increased product variety with higher precision levels for HVN	II	HVN-1	–	Eq/PM
V2-3	Instituted improved organisational arrangements for making constant improvements in process design to meet tighter HVN QCD requirements	III	HVN-1	–	Eq/PM
V3-1	Improved processing and production management to obtain contract to supply toolboxes to HVN	I	HVN-1	–	Eq/PM
V3-2	Improved processing and process design for increased product variety with higher precision levels for HVN	II	HVN-1	–	Eq/PM
V3-3	Improved production management and established high-precision processing lines at new factory to meet tighter QCD requirements	III	HVN-1	–	Eq/PM
V5-1	Improved processing and production management to obtain contract to supply simple plastic components to HVN	II	HVN-1	–	Eq/PM
V5-2	Set up operation to design and manufacture moulds for plastic components to be supplied to HVN	III	HVN-1	–	Eq/PM
V5-3	Conducted market research and developed new products (plastic toys) to export to Europe	III	Other	–	Prd
V6-1	Replicated sample of wire harness to supply to local car manufacturers	II	Other	–	Prd
V6-2	Set up operation to source subcomponents and assemble wire harnesses to be supplied to HVN	II	HVN-1	–	PM
V6-3	Improved management of second-tier suppliers to meet tighter HVN cost reduction targets and environmental standards	III	HVN-1	–	Eq/PM
V7-1	Improved processing and production management to obtain contract to supply sprockets to HVN	II	HVN-1	–	Eq/PM
V7-2	Established new high-precision forging process to supply core engine components to Japanese first-tier supplier to HVN	III	HVN-2	–	Eq/PM
V8-1	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
V8-2	Improved production management to meet large orders to tighter HVN lead time and delivery requirements	III	HVN-1	HVN-2	PM
V9-1	Improved production management practices in supplying subcomponents to local first-tier supplier to HVN	II	HVN-2	–	PM
V9-2	Improved processing to expand production of machinery components for export and domestic market	III	Other	–	Eq
V9-3	Established high-precision forging lines to supply core engine components to HVN	III	HVN-1	–	Eq/PM

Table III-3. Continued

Supplier code/ Event #	Event Title	Stage of Industrial Development	Type of Value Chain		Type of Capability Acquired
			Main	Secondary	
V10-1	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
V10-2	Acquired trivalent chromium plating technology to meet HVN tighter environmental standards	III	HVN-2	Other	Eq/PM
V10-3	Improved production management for new customers in electronics industry	III	Other	HVN-2	PM
V11-1	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
V11-2	Conducted reverse engineering to supply plastic containers to local customers	II	Other	–	Prd
V11-3	Improved production management to meet tighter QCD requirements and to obtain ISO 9001 certification	III	HVN-2	YVN-2	PM
V12-1	Improved processing and production management practices to supply subcomponents to first-tier Japanese suppliers to HVN and YVN	III	HVN-2	Other	Eq/PM
V12-2	Improved processing and production management to realise higher precision levels and shorter lead time required by customers	III	HVN-2	Other	Eq/PM
V13-1	Conducted reverse engineering and manufacture of stamped metal components to order for local assemblers	II	V-C	–	Prd
V13-2	Improved processing and production management practices to obtain contract to supply components to HVN	II	HVN-1	–	Eq/PM
V13-3	Improved production management to meet tighter HVN QCD requirements; recognised by HVN as one of top ten best-performing suppliers of 2007	III	HVN-1	–	Eq/PM
V14-1	Improved processing to produce engine components for local assemblers	II	V-C	–	Eq
V14-2	Improved production management in preparation to obtain approval of and supply components to HVN	III	HVN-1	–	PM
V14-3	Designed and manufactured moulds for components for agricultural machinery and other products	III	Other	–	Eq
V15-1	Conducted reverse engineering and manufacture of die-cast aluminium components to order for local assemblers	II	V-C	Other	Prd/Eq/PM
V15-2	Improved processing and production management practices; won contract to supply components to first-tier Japanese supplier to HVN	II	HVN-2	–	Eq/PM
V15-3	Improved production management and mould maintenance to meet tighter requirements of Japanese first-tier supplier to HVN	III	HVN-2	–	Eq/PM
V16-1	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
V16-2	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
V16-3	Set up mould design and manufacturing operations to explore new customers for motorcycle components	III	HVN-2	Other	Eq

Table III-3. Continued

Supplier code/ Event #	Event Title	Stage of Industrial Development	Type of Value Chain		Type of Capability Acquired
			Main	Secondary	
V17-1	Launched production of clutches to be supplied to local assemblers	II	V-C	–	Eq/PM
V17-2	Improved processing and production management to meet requirements of Japanese first-tier suppliers to HVN	III	HVN-2	–	Eq/PM
V18-1	Conducted reverse engineering and manufacture of stamped metal components to order for local assemblers	I	V-C	–	Prd/Eq/PM
V18-2	Improved processing and production management to produce motorcycle components to be supplied to VMEP	II	Other	–	Eq/PM
V18-3	Replicated samples and improved production management to export forklifts to new customer in Germany	III	Other	–	Prd
V19-1	Conducted reverse engineering and manufacture of an increasing variety of engine components to order for local assemblers	II	V-C	–	Prd/Eq/PM
V19-2	Improved product design capacity to develop a new motorcycle valve model and improved processing of them as replacement components for domestic market	II	Other	–	Prd/Eq
V19-3	Improved process design to achieve better quality and productivity of replacement components for the domestic market	III	Other	–	Eq
V20-1	Conducted reverse engineering and manufacture of silencers to order for local assemblers	II	V-C	–	Prd/Eq
V20-2	Improved reverse engineering and processing to meet requirements of local assemblers	III	V-C	–	Prd/Eq
V20-3	Improved production management to produce motorcycle components for VMEP	III	Other	–	Eq/PM
V21-1	Launched the assembly of shock absorbers for local assemblers	III	V-C	–	Prd/PM
V22-1	Launched the manufacture of motorcycle chains for local assemblers	II	V-C	–	Prd/PM
V22-2	Conducted market research and developed an increasing variety of replacement components for the domestic market	III	Other	–	Prd

Notes:
(1) 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 Yamaha Vietnam value chain; V–C = Vietnamese–Chinese chain.
(2) Types of capability are abbreviated as follows: Prd = new product introduction; Eq = equipment-related; PM = production management.
Source: The author’s interviews.

A closer look at the learning events reveals that the type of chain seems to be associated with the functional type of capability acquired. It turned out that a single event often resulted in the supplier's acquisition of capabilities in more than one function. 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 were 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: new product introduction (9 out of 11 events), equipment-related activities (7 events), and production management (6 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 III-4 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. At this stage, the sampled suppliers conducted routine operations in the domestic market (equivalent to the *operational* level) or had not yet commenced production.

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 (V1, V2, and V6) 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 (V5, V6, and V9) did not reach this stage with regard to either capability type.

The levels of learning attained by second-tier suppliers (V10–12 and V15–7) generally fell short of those of first-tier suppliers. None reached the adaptive level, and only one of the six second-tier suppliers (V12) reached the assimilative level for both equipment-related and production management capabilities.

Table III-4. Learning Attainment by Case Suppliers
(a) Learning in Japanese Chains

Supplier	Starting Level		Level of Most Advanced Activities		Number of Years in Chain
	Equipment-related	Production Management	Equipment-related	Production Management	
V1	Operational	Operational	Adaptive	Adaptive	14
V2	Operational	Operational	Adaptive	Assimilative	14
V3	Operational	Operational	Assimilative	Assimilative	14
V5	Operational	Operational	Assimilative	Operational	9
V6	Below operational	Operational	Operational	Adaptive	9
V7	Operational	Operational	Assimilative	Assimilative	9
V8	(n/a)	(n/a)	Assimilative	Assimilative	6
V9	Operational	Operational	Operational	Operational	8
V10	Operational	Operational	Assimilative	Operational	11
V11	Operational	Operational	Operational	Operational	9
V12	Operational	Operational	Assimilative	Assimilative	6
V13	Operational	Operational	Assimilative	Assimilative	7
V14	Operational	Operational	(No event)	Assimilative	5
V15	Operational	Operational	Operational	Operational	6
V16	Operational	Operational	Assimilative	Operational	12
V17	Operational	Operational	Operational	Operational	5

(b) Learning in Vietnamese–Chinese Chains

Supplier	Starting Level			Level of Most Advanced Activities			Number of Years in Chain
	New Product Introduction	Equipment-related	Production Manage-ment	New Product Introduction	Equipment-related	Production Manage-ment	
V13	Operational	Operational	Operational	Operational	(No event)	(No event)	4
V14	Operational	Operational	Operational	(No event)	Operational	(No event)	1
V15	Operational	Operational	Operational	Operational	Operational	Operational	4
V16	Operational	Operational	Operational	Adaptive	(No event)	(No event)	9
V17	(n/a)	(n/a)	(n/a)	(No event)	Operational	Operational	7
V18	Operational	Operational	Operational	Operational	Operational	Operational	10
V19	Operational	Operational	Operational	Operational	Operational	Operational	9
V20	Operational	Operational	Operational	Operational	Operational	(No event)	10
V21	(n/a)	(n/a)	(n/a)	Operational	(No event)	Operational	5
V22	(n/a)	(n/a)	(n/a)	Operational	(No event)	Operational	4

Note:

(1) '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.

(2) For V8, V17, V21 and V22, starting level could not be identified because their business start-up coincided with the entry into the respective value chain.

Source: The author's interviews.

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: V16 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/or 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 2008–09. 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.

5.2 Learning Trajectories: Identifying Discontinuity

This subsection 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. Figure III-3 maps the sequence of learning events experienced by the 21 case suppliers. Each event is numbered and shows the level and functional category of capability acquired by each supplier. The subsection begins by examining the 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).

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

Of the 30 learning events identified by Group A suppliers, 25 took place principally in activities in Japanese chains and the remaining 5 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.

Figure III-3. Supplier Learning Trajectories

(a) Suppliers in Group A

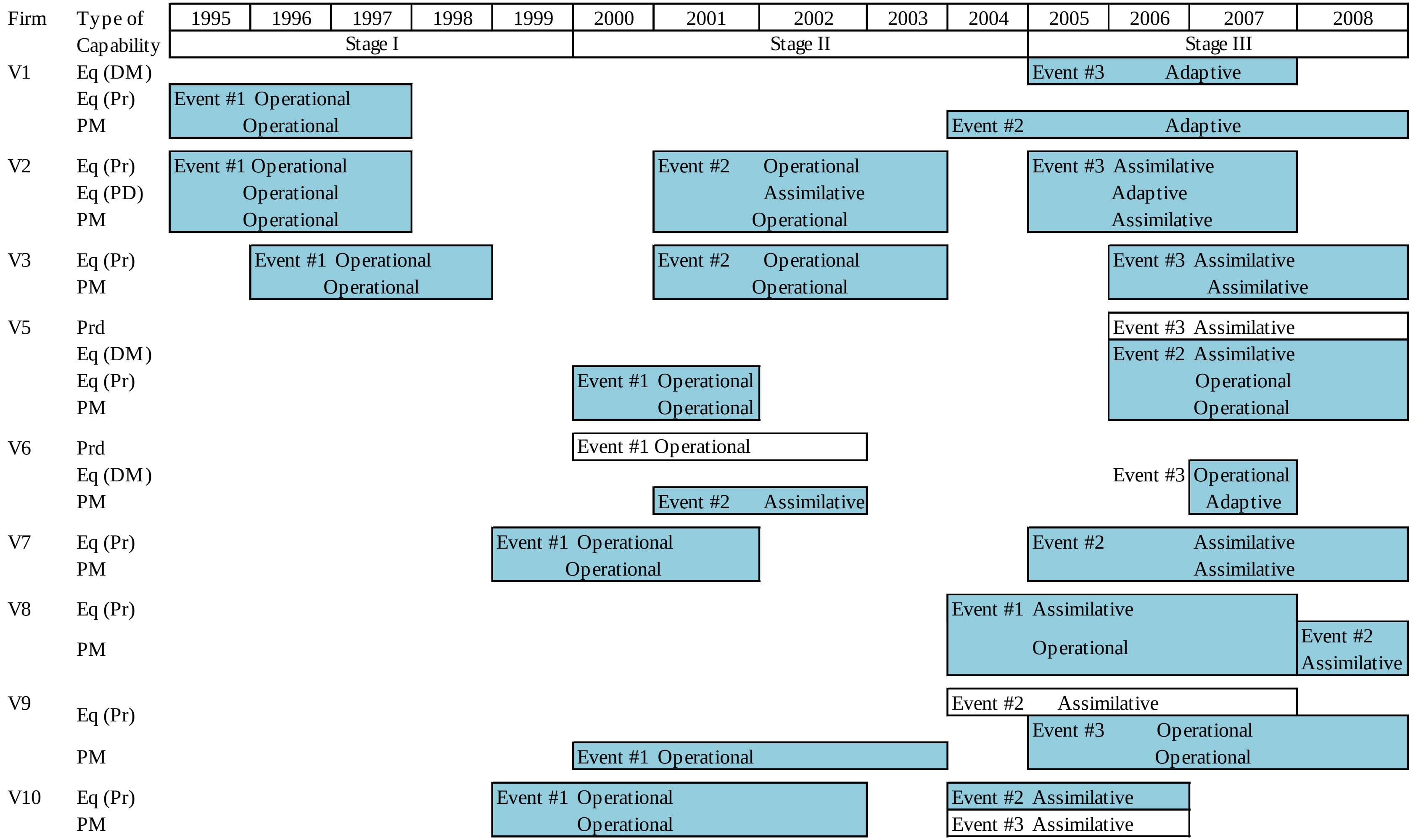
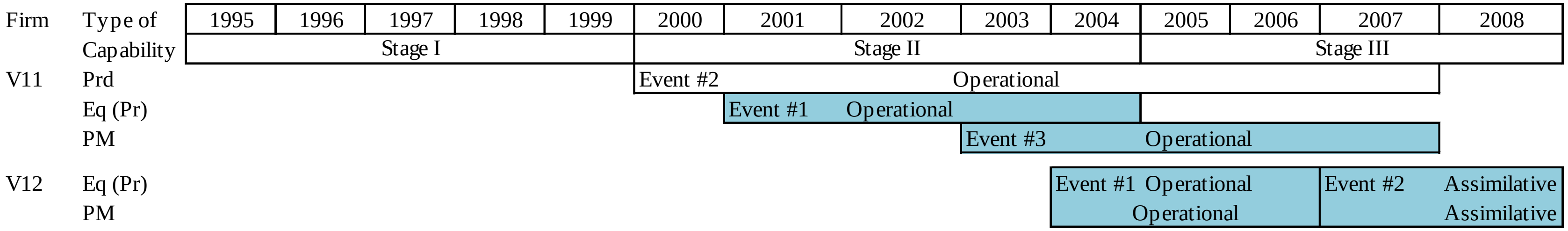


Figure III-3. (a) Suppliers in Group A (Continued)



(b) Suppliers in Group B

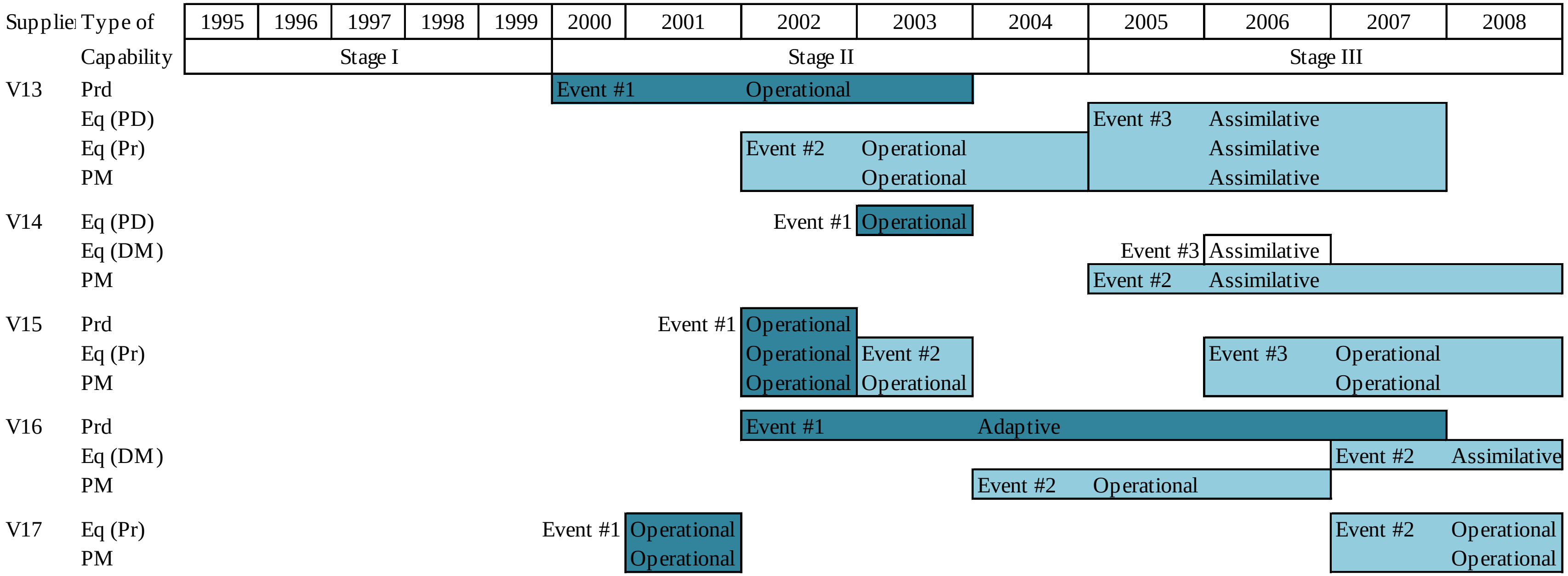


Figure III-3. Continued

(c) Suppliers in Group C

Supplie	Type of Capability	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
		Stage I					Stage II					Stage III			
V18	Prd			Event #1		Operational					Event #3	Operational			
	Eq (PD)					Operational									
	Eq (Pr)					Operational			Event #2	Operational					
	PM					Operational				Operational	Event #3	Operational			
V19	Prd					Event #1		Operational		Event #2	Adaptive				
	Eq (Pr)							Operational			Operational				
	Eq (PD)												Event #3	Adaptive	
	PM					Event #1		Operational							
V20	Prd						Event #1	Operational			Event #2	Operational			
								Operational				Operational			
	Eq (Pr)										Event #3	Operational			
	PM											Operational			
V21	Prd										Event #1	Operational			
	PM											Operational			
V22	Prd					Event #1		Operational				Event #2	Operational		
	PM							Operational							

Notes:

(1) 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.

(2) 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.

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 III-3(a) shows that instances of progress towards the assimilative level up to Stage II were limited to the process design dimension of V2's equipment-related capability and V6's production management capability. While the absence of learning events in some suppliers in earlier stages (e.g. supplier V1 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 to be 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 – which by definition is equivalent of the assimilative level – by 2006–8 (interview #5).

Stage III transpired to be a period of major leaps in capability level for several high-performing suppliers. V1, a first-tier supplier of plastic components, is a typical example. In 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, V1 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. V1 also implemented organisational improvement that enhanced its levels of production management in order to satisfy the increasingly challenging QCD performance targets set by HVN (Event #2).

Likewise, suppliers V2 and V6 also experienced critical learning events in Stage III; however, the functional types of capability in which 'leaps' took place differed across suppliers. V2 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, V6 focussed its learning on production management. In response to stringent cost reduction target 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.

Yet, for some suppliers, Stage III transpired to be a period of slower or even stalled learning. For example, V5 became a first-tier supplier of plastic components to HVN four years after V1. To begin with, V5 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 V5 lagged behind that of V1. As of Stage III, V5 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 V5'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, V3 improved its levels of precision and production management sufficiently to meet HVN's increasingly demanding requirements (Event #3). V8 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.

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

Figure III-3(b) shows the sequence of learning events that took place in the ten 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 higher levels of capability. Moreover, levels of capability acquired in Vietnamese–Chinese chains remained largely rudimentary.

With the exception of V16, 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. V16 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, V20 and V21 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 similar learning patterns 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. V13, V14, and V16 reached the assimilative level for equipment-related and/or production management capabilities, while V15 and V17 failed to progress beyond the operational level for these types of capability.

Only three suppliers originally in groups B and C – namely, V16, V20 and V21 – continued to operate in Vietnamese–Chinese chains into Stage III. Of these, V16 alone managed to attain an adaptive level of new product introduction capability. The most important learning event for V16 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, V16'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.[107]

The frequent launching of new models reflecting the latest market trends and policy requirements enabled V16 to maintain sales to local assemblers even into Stage III. Conversely, neither V20 nor V21 succeeded in improving their capabilities beyond the operational level. V20 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 V21, 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.

5.3 Summary

This section explored the 'how' question about supplier learning trajectories. It began

[107] Interview with V16 #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).

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 sampled firms, 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 attainment emphasised in the existing literature transpired 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 focussed 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, V16, 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.

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

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, sections 6 and 7 attempt to explain supplier learning trajectories in terms of the roles of key actors: lead firms and suppliers. In endeavouring to explain the fundamental differences in learning patterns between Japanese and Vietnamese–Chinese chains, Section 6 outlines two contrasting learning models in their original forms, as they emerged in stages I and II. This is done by engaging in aggregated analyses of 44 learning events in Japanese and Vietnamese–Chinese chains respectively.

6.1 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 III-5 shows the most important and second most important actors in the 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 respectively point to two contrasting models of 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 actors. Since the above discussion suggests that contrasts between the two models can be observed more clearly in stages I and II

Table III-5. Key Actors in Learning Events

(a) Learning events at the first tier of Japanese chain

Stage	Firm	Event #	Key Actors	
			Most Important	Second Most Important
I	V1	1	Supplier itself	Customers or customer-designated unit (HVN)
	V2	1	Supplier itself	Customers or customer-designated unit (HVN)
	V3	1	Supplier itself	Customers or customer-designated unit (HVN)
II	V2	2	Supplier itself	Customers or customer-designated unit (HVN)
	V3	2	Supplier itself	Customers or customer-designated unit (HVN)
	V5	1	Supplier itself	Customers or customer-designated unit (HVN)
	V6	2	Supplier itself	Customers or customer-designated unit (HVN)
	V7	1	Supplier itself	Customers or customer-designated unit (HVN)
	V13	2	Supplier itself	Customers or customer-designated unit (HVN)
III	V1	2	Supplier itself	None
	V1	3	Supplier itself	Customers or customer-designated unit (HVN)
	V2	3	Supplier itself	Customers or customer-designated unit (HVN)
	V3	3	Supplier itself	Customers or customer-designated unit (HVN)
	V5	2	Supplier itself	Other external actor (Vietnamese provider of software)
	V6	3	Supplier itself	Other external actor (related company)
	V8	2	Supplier itself	Other external actor (related company)
	V9	3	Supplier itself	Customers or customer-designated unit (Japanese partner designated by HVN)
	V13	3	Supplier itself	Customers or customer-designated unit (HVN)
	V14	2	Supplier itself	Customers or customer-designated unit (HVN)

(b) Learning events at the second tier of Japanese chain

Stage	Firm	Event #	Key Actors	
			Most Important	Second Most Important
II	V9	1	Supplier itself	Other external actor (Japanese aid organisation)
	V10	1	Supplier itself	Customers or customer-designated unit (Japanese first-tier suppliers)
	V11	1	Supplier itself	Customers or customer-designated unit (Japanese motorcycle manufacturers and their first-tier suppliers)
	V15	2	Supplier itself	Customers or customer-designated unit (Japanese first-tier supplier)
III	V7	2	Supplier itself	Customers or customer-designated unit (Japanese first-tier supplier and a partner designated by HVN)
	V8	1	Supplier itself	Customers or customer-designated unit (HVN)
	V10	2	Supplier itself	Customers or customer-designated unit (Japanese first-tier suppliers)
	V11	3	Supplier itself	Customers or customer-designated unit (Japanese motorcycle manufacturers and their first-tier suppliers)
	V12	1	Supplier itself	Customers or customer-designated unit (Japanese first-tier suppliers)
	V12	2	Supplier itself	Customers or customer-designated unit (Japanese first-tier suppliers)
	V15	3	Supplier itself	Customers or customer-designated unit (Japanese first-tier supplier)
	V16	2	Supplier itself	Other external actors (visited and observed factories in Japan)
	V16	3	Supplier itself	Other external actors (machinery providers)
	V17	2	Supplier itself	Other external actor (Japanese aid organisation)

(c) Learning Events in Vietnamese–Chinese Chain

Stage	Firm	Event #	Key Actors	
			Most Important	Second Most Important
I	V18	1	Supplier itself	None
II	V13	1	Supplier itself	None
	V14	1	Supplier itself	None
	V15	1	Supplier itself	None
	V17	1	Supplier itself	Other external actor (Chinese partner)
	V19	1	Supplier itself	Other external actors (visited and observed factories in Taiwan)
	V20	1	Supplier itself	None
	V22	1	Supplier itself	Other external actor (Russian partner)
III	V16	1	Supplier itself	Customers or customer-designated units (local assemblers)
	V20	2	Supplier itself	Customers or customer-designated units (local assemblers)
	V21	1	Supplier itself	Customers or customer-designated units (local assemblers)

Source: The author's interviews.

than in Stage III, the remainder of this section searches for similarities across learning events in the same types of value chain, with the aim of illuminating the key features of the original Japanese and Vietnamese–Chinese learning models respectively as they emerged in stages I and II.

6.2 Lead Firm-Driven Learning Model in Japanese Chains

Table III-6 shows the fieldwork results for 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 Section 3. Consistent with the discussion in Section 6.1, 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.

Table III-6. Sources of Learning in Learning Events

			Japanese Chain (first tier)				Japanese Chain (second tier)			Vietnamese–Chinese Chain			
Timing (stages at which learning events took place)			Total	I	II	III	Total	II	III	Total	I	II	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		Physical investment	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). Based on the author's interviews with suppliers.

6.2.1 The Lead Firm

Table III-6 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 in 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.

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.[108] Consequently, HVN's requirements of its suppliers centred on the 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 III-7 shows the types of capability 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. Although there is a criterion termed 'development', specific requirements suggest that suppliers were expected to produce and maintain dies and moulds, and 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 extended 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 "constructive 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 V3 pointed out in relation to its Event #1:

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[108] 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).

"[HVN] provide us with 'training' in the context of production…for instance, [in the form of] inspection and advice" (interview with V3 #1).

Table III-7. 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*
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: * 3S is a Japanese management system comprising: Seiri=orderliness; Seiton=neatness; and Seiso=cleanliness.
Source: Presentation made by HVN's director in charge of procurement at the Seminar on Vietnam-Japan Supporting Industry Business Promotion hosted by JETRO, SME Technical Assistance Center, and JICA and held at Melia Hotel, Hanoi on 22 January 2007.

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 V2 #1; V3 #1). These experts provided hands-on advice and training directly to managers in suppliers' factories (V3 #1). In instances of unexpected trouble in particular, lead firm experts were usually dispatched to assist. The general managers of V1 and V2 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 V1 #4 and V2 #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 V5, V7 and V13). In relation to its first learning event, V7'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 V7 #2).

As noted above, there was an exception. In relation to its first learning event, V6 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, V6 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).

6.2.2 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 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 V1 (as of the date of 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 V1 #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 V13 #1 on Event #2)

As shown in Table III-6, 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 V2 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 V2 #1)

Second, where physical investments were made, they tended to be small in scale. For example, V2 was only able to invest in a few second-hand Japanese lathes and Chinese stamping machines due to financial constraints (interview #1).

6.2.3 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, V7); production management training programmes organised by a Vietnamese organisation (Event #2, V3); and supplier employee visits to Taiwan, Thailand or China to observe factories in similar industries (Event #1, V5). 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 III-5). This suggests that these external sources played a complementary role rather than a critical role in supplier capability building.

6.3 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 Section 6.1, Table III-6 shows the critical role played by suppliers in Vietnamese–Chinese chains themselves. The following subsections discuss the roles of key actors in this learning model.

6.3.1 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; and 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, for which de facto standard designs were widely shared within the industry (Paper II), lead firms placed orders by merely stating required components without providing any samples, design drawings, or other specifications (interview with V19 #3). 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 V13 #1, V15 #2, V18 #1, V22 #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, but rather a reflection of lead firm inability to coordinate product parameters around de facto standard models (Paper II). Indeed, it should be borne in mind that ultimately, 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 (ibid.).

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 V13 #1;

V15 #2; V16 #1; V17 #1; V20 #2). Local assemblers in effect compensated for their lack of coordination capacity in an ad hoc fashion by demanding that suppliers make ex post adjustments (Paper II).

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 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.

6.3.2 The Supplier

Table III-6 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 focussed 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 V21 #1; V22 #1), or those that had previously only produced relatively simple items such as bicycle parts (interviews with V18 #1; V20 #1).

6.3.3 External Actors other than the Lead Firm

In some events, external sources of knowledge other than the lead firm complemented internal learning sources, particularly where suppliers only had limited internal resources. Two suppliers received direct technology transfer from abroad. In initiating component production, V17 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 V17’s factory throughout the period of the contract, which extended over seven years, to assist with machinery operation (interviews #1, #2). Similarly, V22 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, V15’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 are operated (interview #2). Likewise, V19’s general director repeatedly visited Taiwan to observe the type of machinery being used, process design techniques, and methods of production management (interview #2).

6.4 Summary

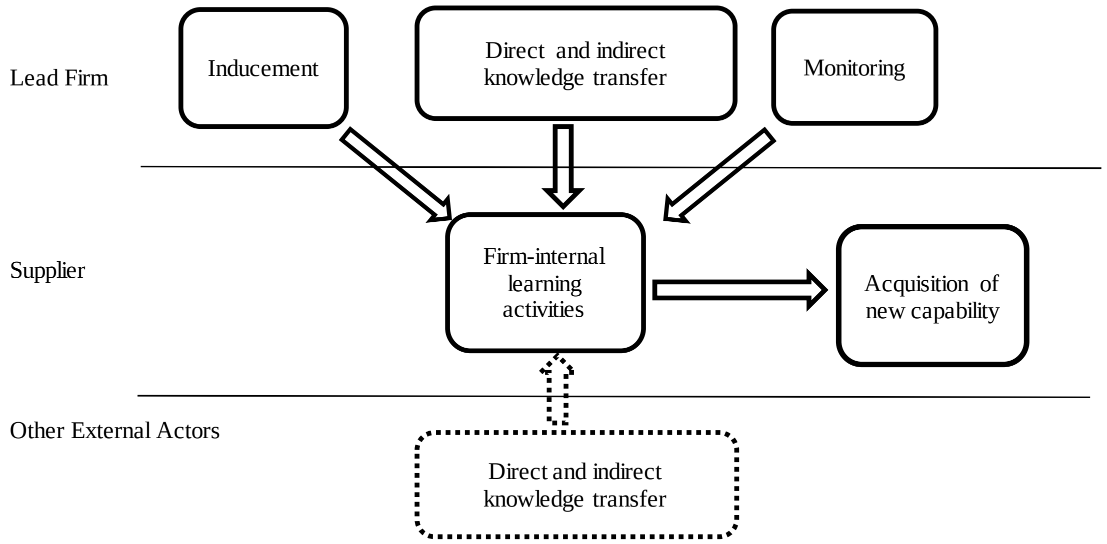
As a first step in analysing why supplier learning trajectories evolved in the ways identified in Section 5, this section conducted an aggregated analysis of learning events in terms of learning sources, which focussed on the roles of key actors – lead firms and suppliers. Following the replication logic underlying the case study, this section searched for similarities in sources across learning events that took place in the same types of value chain. 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 Figure III-4. 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 was 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 learning resources, very few of them sought to manoeuvre into independent or innovative learning activities in stage I to II.

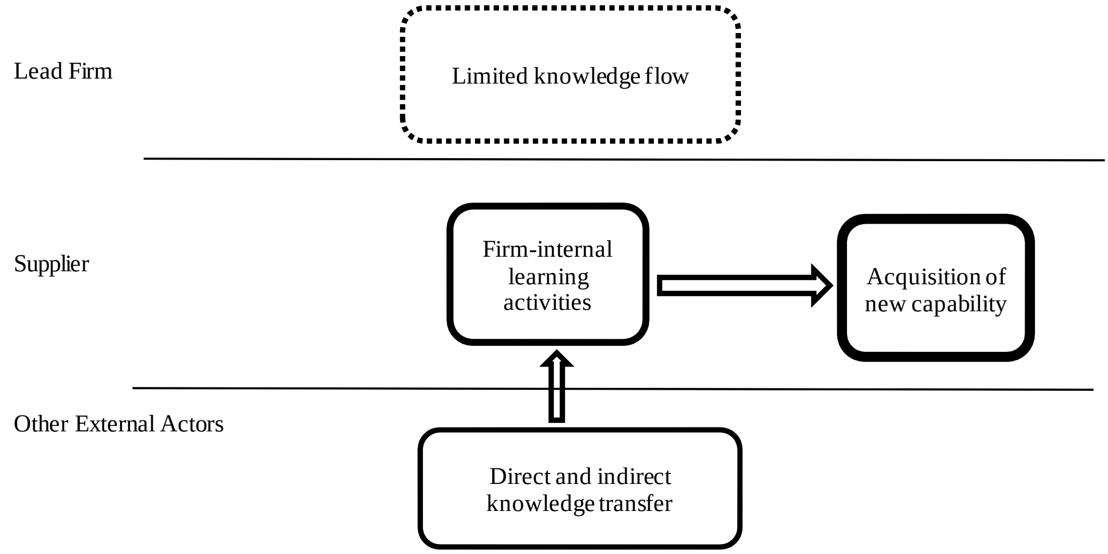
Conversely, the Vietnamese–Chinese learning model is based primarily on the supplier’s own initiative in the mobilisation of internal sources of knowledge. Under this model, knowledge flows between the lead firm and its suppliers were extremely limited and invariably not managed in a fashion conducive 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.

Figure III-4. Original Supplier Learning Models in the Vietnamese Motorcycle Industry (Stage I–Stage II)

(a) Japanese Learning Model



(b) Vietnamese–Chinese Learning Model



Source: The author.

7. Evolution of the Two Learning Models (2005–2008): In-depth Analyses of Selected Suppliers

This section continues to explore why supplier learning trajectories evolved in the ways they did. Having outlined the key features of the two contrasting learning models in their original forms, the focus turns to how they 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 section relies on an in-depth examination of a smaller number of particularly illuminating cases. Section 7.1 examines two distinct directions of change emerging in Japanese chains coordinated by HVN. Suppliers analysed in depth are V1, V2, V3 and V5 (Variant 1 of the Japanese model), and V7 and V9 (Variant 2 of the Japanese model). Section 7.2 switches the focus to changes in Vietnamese–Chinese chains. In so doing, it examines V16 and V18, two suppliers of stamped steel components that continued to operate in Vietnamese–Chinese chains up to Stage III yet with contrasting learning trajectories.

7.1 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 subsection 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 Section 6.2), 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.

7.1.1 Drivers for Change: Adjustments in Lead Firm Sourcing Practices

As discussed in Section 6, HVN played an extensive role in assisting the long-term development of its suppliers' production capabilities in stages I and II.[109] 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 in 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, which was priced at roughly one-third of its previous models. The other came in the form of the local content rules, which were announced 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 its requirements on suppliers was subject to the following limitations. First, HVN's purchasing power was limited due to the small scale of orders. Even though the new model had gained popularity among Vietnamese consumers, the

[109] Unless otherwise specified, the analysis in this subsection is based is based on Paper II.

company was constrained in the expansion of production due to a series of restrictive policies introduced by the Vietnamese government from 2002. Consequently, annual production only increased to some 400,000 units (Paper II, Figure II-2), which was barely sufficient for suppliers to achieve minimum economies of scale in the manufacture of those components that did not require capital-intensive production processes.

Second, suppliers faced little substantive competition. The limited availability of firms 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. Therefore, 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 within the value chain 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 (Paper II, Figure II-2), 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, including Japanese suppliers that had previously hesitated to invest in Vietnam. This meant that HVN could no longer spare its resources in nurturing new suppliers from scratch.

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. These 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 (interview with HVN #5).

Second, technical assistance was now offered selectively. Having obtained huge purchasing power and the capacity to switch suppliers, HVN began to prioritise the new policy of developing closer ties with those suppliers with which Honda had direct capital relations (Paper II). In addition to Japanese suppliers that were members of the Honda Group, such favoured suppliers included Honda's joint venture partner in Vietnam, VEAM. As a result, HVN shifted to "a focussed 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, particularly VEAM members. V7 was one of the first VEAM members to be selected as an HVN first-tier supplier in the early 2000s. With the new priority, V9 and V13 were added as first-tier suppliers in 2004–05. Finally, after four years of preparation, by early 2009, HVN had agreed in principle to source metal stamped components from V14 (interview with V14 #1).

7.1.2 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 Section 6.2. The present subsection focuses on an emerging variant of the Japanese learning model, which was characterised by the growing importance of suppliers' independent, innovative initiatives in the face of diminished direct knowledge transfer on 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 (V1 and V5), and two suppliers of various metal components (V2 and V3). These firms were selected because suppliers belonging to each set started to exhibit contrasting learning trajectories by this stage in spite of similar developments up to Stage II.

The analysis of learning events experienced by these suppliers up to the early 2000s (Events #1 and #2 in V2; Events #1 and #2 in V3; Events #1 and #2 in V1; Event #1 in V5) supports the original Japanese model. V1, V3, and V5 emphasised how frequent hands-on advice offered by Honda's experts helped them to overcome initial difficulties. V2 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 difficulty in solving by themselves (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.

V1 noted that it faced its biggest challenge in terms of production management in about 2004–05. 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, V2 pointed out that it was between 2005 and 2008 that the company transformed its equipment-related activities most extensively. Increasing orders for complex components[110] and challenging annual cost reduction targets imposed by HVN became the impetus for V2 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, lead firm roles in addition to specifications and monitoring were largely limited to checking and approving process design and factory layout, and the troubleshooting of problems that could not be solved by the suppliers themselves.

Last and most important, 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

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[110] In the late 1990s, V2 produced 15 or 16 types of simple component requiring little processing; however, by 2008, it was producing more than 300 types of component, including some that had to undergo 25 distinct processes (interview #2).

instructions provided by HVN. This is illustrated by Event #3 in V1. 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 it worked with.[111] 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 in the company into an integrated quality control system (interview with V1 #3).

Through organising study groups and discussions within and across departments, V1 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 V1 #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 V1 #4). This is in sharp contrast to V5, 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 in V2.[112] This supplier acquired the ability to design production processes for complex components and implement continuous improvement in such processes. To this end, V2 not only invested in human resources that is, the training of engineers, and physical equipment such as hot and cold

[111] HVN was V1'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 V1 #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.

[112] Unless otherwise mentioned, the discussion on this event is based on the interview with V2 #2.

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, V2 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 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 key resource to which process design engineers could refer when either initiating new products or improving existing ones.

Through these changes, V2 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 V3 and V5 fell short of those achieved by V2 and V1, primarily due to a 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. V5 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.

V5 acquired mould design and manufacturing capability via the quick route of investment in new machinery and equipment, and 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, V5 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 V1. Unlike V1, V5 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, V3, had made steady progress in internal resource accumulation in response to 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 V2. In terms of physical investment in new machinery and product lines, V3 was on a par with V2. However the main differences between the two suppliers lay in their respective degrees of independent innovative effort. Although V3 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.

7.1.3 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 Subsection 7.1.2 was observed for the majority of HVN's first-tier suppliers, the current type of adjustment was limited to two VEAM member company initiatives: V7's initiation of forging processes for connecting rods (Event #2), and V9's commencement of forging processes for crankshafts (Event #3).[113] 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 in about 2005,[114] 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 of 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 J11 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

[113] 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).

[114] 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 J11 #1).

divergence. Even though the two suppliers had the relevant technology, HVN was apparently more enthusiastic to outsource high-precision processing to V7 than V9. Indeed, HVN's procurement manager admitted that V7 had a more advanced level of technology at this stage (interview with HVN #4). Having supplied sprockets to the lead firm since 2001, V7 had made progress in improving equipment-related and production management capabilities (Event #1).

Conversely, V9 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 V7 (Event #1). HVN made the decision to outsource the high-precision processing of crankshafts to V9 "taking into consideration the interests of the joint venture partner, VEAM" (interview with HVN #4). Faced with large gaps in V9'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 V9, which opted to acquire the requisite technology independently (ibid.).

Due to the large gap in the capability levels of both V7 and V9, 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 V7 and V9.

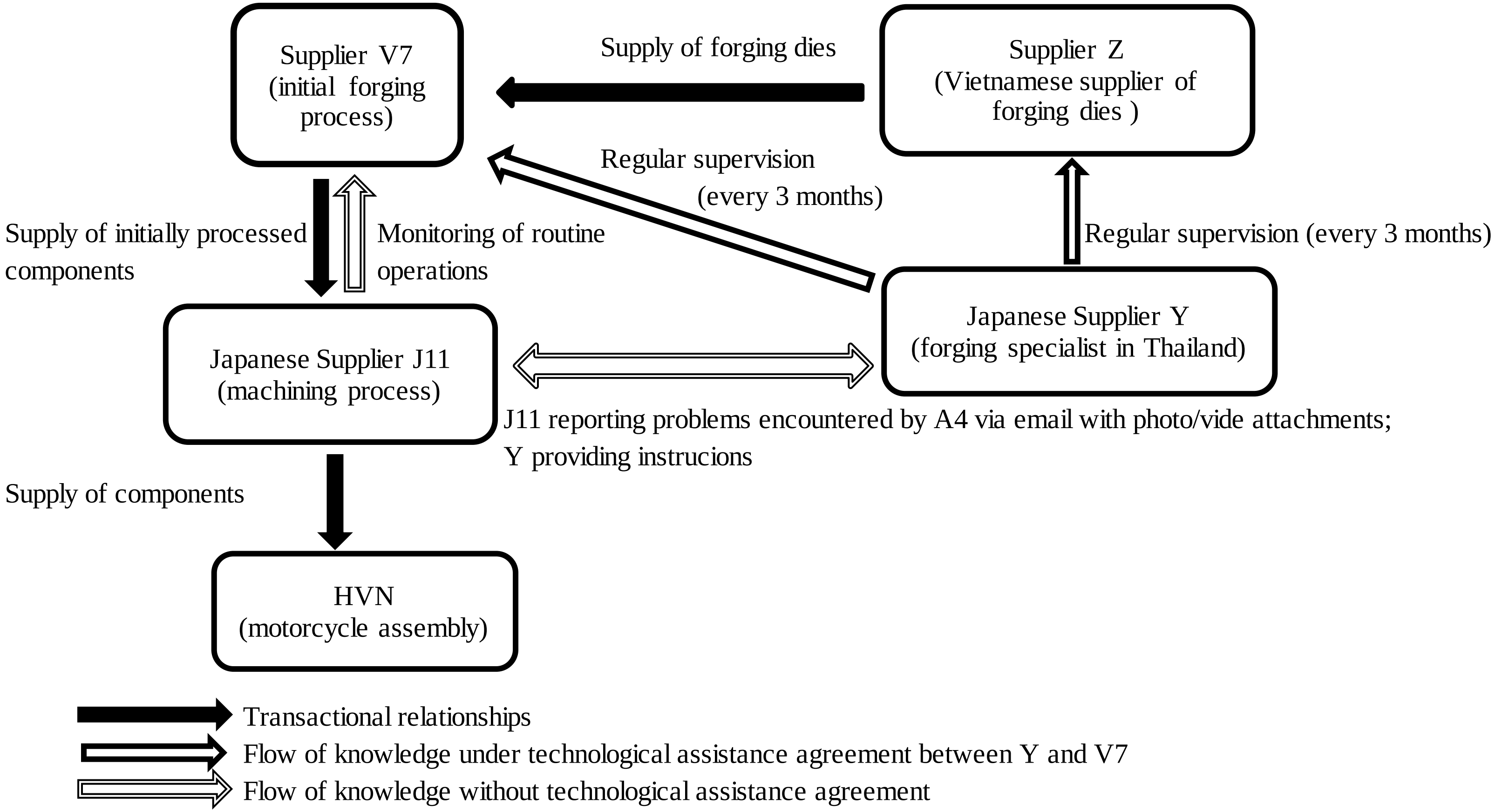
In the case of V9, the designated partner was a Japanese company with expertise in high-precision forging technology, designing and manufacturing dies, and the development of forging equipment and production systems. This company provided V9 with a comprehensive package of assistance including (1) drawings, dies, process designs, working standards, and quality control schemes; (2) specifications for the equipment to be installed; (3) an intensive training programme for V9's engineers and operators, including a 3-month course for 15 engineers at the company's headquarters in Japan; and (4) a full-time Japanese supervisor posted at V9's factory to monitor and supervise the daily operation of the new production lines (interview with V9 #1). The last element of the package deserves particular attention. V9'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 V7 involved more complex transactional relations and knowledge flows, as shown in Figure III-5. In addition to V7 itself, three other actors were involved: Japanese supplier J11 (a direct customer of V7 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 supplying connecting rods to Honda Thailand; entered into a technological assistance agreement with V7); and Vietnamese supplier Z (a manufacturer that supplied forging dies to V7).

Under the technological assistance agreement between Y and V7, experts from the former visited V7 and Z every three months to conduct regular checks and offer advice. Given the limited frequency of Y's visits, supplier J11 monitored V9's routine operations, acting as a mediator as necessary. Accordingly, supplier J11 reported problems in V7's operations via emails to Y with photographic and video attachments, and supervised V7 on the basis of recommendations received in reply. In other words, J11 took direct responsibility for V7's performance in relation to HVN, providing V7 with hands-on support in the absence of any formalised agreement or payment.

Under this arrangement, V7 was subject to far-reaching and active intervention from both J11 and Y. During the initial years of operation, J11 required V7 to provide situation reports on a daily basis (interview with J11 #1). J11 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 V9, 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.).

Figure III-5. Transactional Relationships and Knowledge Flows comprising Supplier V7's Learning Event #2



Source: The author, based on interviews with supplier V7 #2, #3; Japanese supplier J11 #1; and HVN #4, #5.

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 V7. Since the early 2000s, V7 had consistently engaged in internal training to upgrade levels of processing, maintenance of dies, and production management (interviews with V7 #1, #2). By 2008, the frequency and intensity of assistance from J11 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 J11 #1), a task that required thorough and sophisticated technical knowledge that very few if any Vietnamese firms had managed to achieve.

With reduced assistance, V7 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 V7 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 JJ11 #1). This suggests that production management still had room for improvement.

In the case of V9, 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 V9 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:

> We buy the components from V9 because we regard [V9's forging factory] as a Japanese factory. Without the [full-time Japanese] supervisor, the forging factory would soon be like V9's other old-fashioned factories [which manufactured products for other customers].
>
> (interview with HVN #5)

This suggests that V9's track record in sustaining the stable operation of its first forging line and in reaching HVN's QCD targets from 2006 to 2008 cannot be entirely attributed to capabilities specific to the supplier. As of 2008, the learning event was still on-going. Even though V9 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.

7.2 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 prevailed during stages I and II. This subsection investigates the transformation of this learning model via an in-depth comparative analysis of suppliers V16 and V18, as 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 (Paper II, Section 6.2). By this stage, the local assembly sector was dominated by a small number of large firms focussing 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 (ibid.).

The absence of a lead firm-initiated impetus for changing arm's-length relations was corroborated by suppliers V16 and V18. First, neither of them had main customers or local assemblers that placed regular orders over the long term. As of the time of the interview in 2008, supplier V16 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 V16 #1)

Second, there were no instances of lead firm *direct knowledge transfer* playing a key role in supplier learning in Stage III (Table III-6). 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 V16 nor V18 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, V16 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 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 V16 #2 on Event #1)

Given such limited lead firm engagement, any impetus for change came from the supplier. This is illustrated by V16's first learning event, which extended from Stage II to Stage III. Through this event, V16 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, V16 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 3 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 a marketing department that made systematic attempts to survey customer preferences by engaging in regular communication with local assemblers, motorcycle dealers, and final consumers (interview with V16 #1, #2). V16's attempts at engaging with its customers resulted in the following two-way knowledge flow: (1) lead firms transferred information on market demand to V16; (2) by pooling and analysing the market information gathered from various actors, V16 developed component prototypes; and (3) lead firms provided feedback on the prototypes (ibid.).

Here it should be emphasised that unlike suppliers in Japanese chains, V16 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, V16 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 chain. Thus, under volatile market conditions, V16 was able to save on product development costs and avoid the risk of becoming dependent on a particular lead firm.

By 2005–06, V16 was able to launch 3 to 4 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 new government policy which required the meeting of Euro 2 emission standards (ibid.). It was a combination of investment in physical and human resources, and the strategic pooling and use of knowledge flows with many lead firms that enabled V16 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, V18 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 parts – 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.).

V18 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, V18 suffered from a serious decline in sales. In 2006, it decided to cease the manufacture of motorcycle components for local assemblers and transfer to other products – although as of 2008, its endeavours in exploring new markets had met with limited success.[115]

7.3 Summary and Discussion

In an attempt to answer the question of why supplier learning trajectories evolved over time, this section examined adjustments that took place in the two original learning

[115] From 2003, V18 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).

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 Section 6 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 actors. Figure III-6 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 (Figure III-6a), 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 (Figure III-6b) 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 assistance from the companies designated by the lead firm, leaving little room for the former to manoeuvre. However, the comparative case study of V7 and V9 showed that suppliers' internal mobilisation of resources still influenced learning outcomes.

Figure III-6c 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, V16, took the lead in initiating a two-way knowledge flow with its customers in the course of its second learning event. Assemblers provided V16 with key inputs for product design – i.e. market information – while the supplier responded to lead firm requirements by initiating several prototypes incorporating its own suggestions and specifications. While the intensity of knowledge flow in this variant cannot be compared to that in Japanese chains, together with several other suppliers, V16 formed a "shared supply base" (Sturgeon and Lee 2005) from which to service local assemblers in general (Paper II).[116]

Not only did the formation of advanced capabilities enable V16 and other suppliers 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 huge

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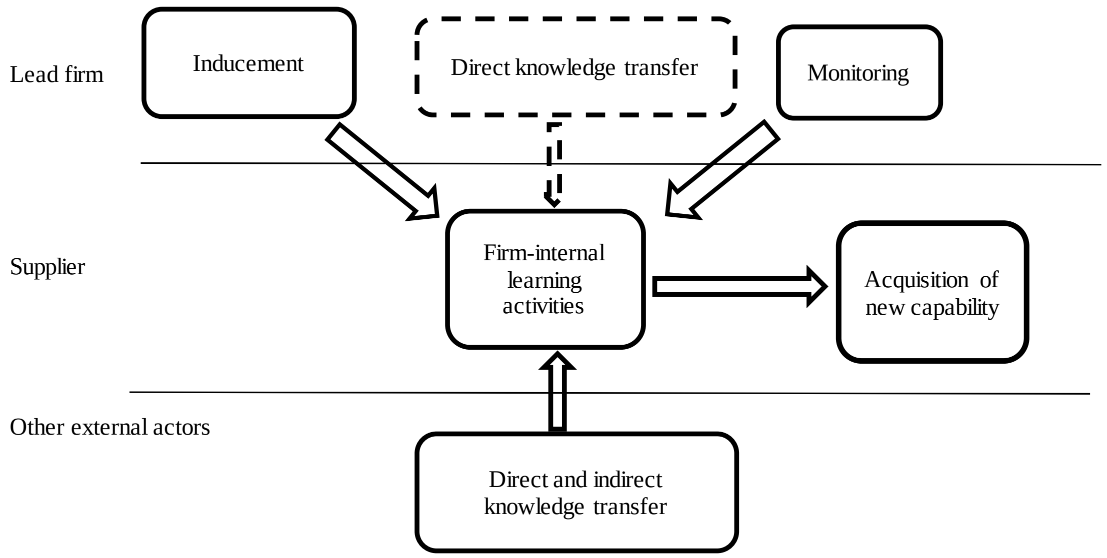
[116] This organisational pattern would seem to resemble that observed in industries where standards of compatibility give rise to modular networks (Sturgeon and Lee 2005); although the partiality of component standardisation in the Vietnamese motorcycle assembly sector means that emerging organisational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

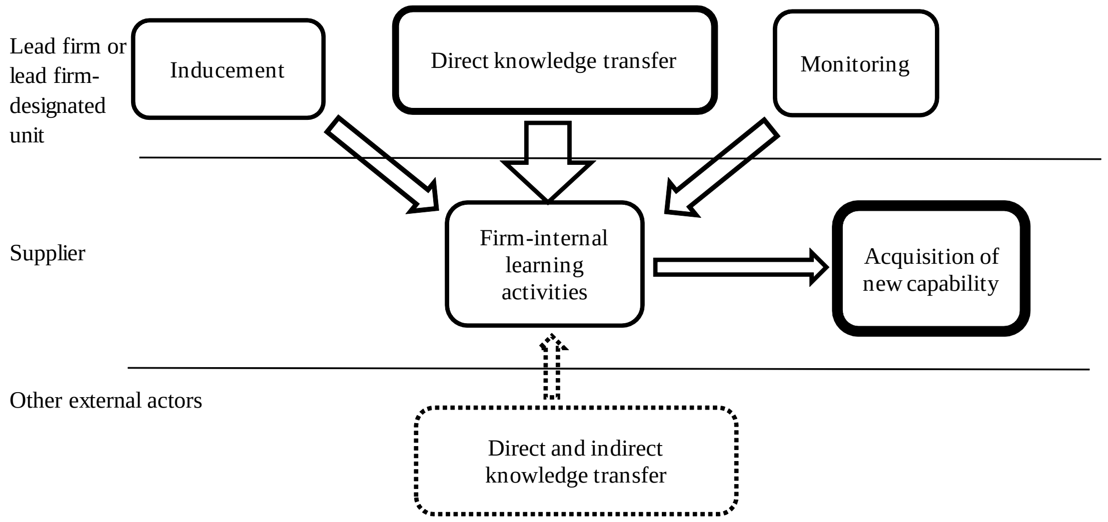
manufacturing economies of scale (Paper II).

Figure III-6. Adjustments to Learning Models (Stage III)

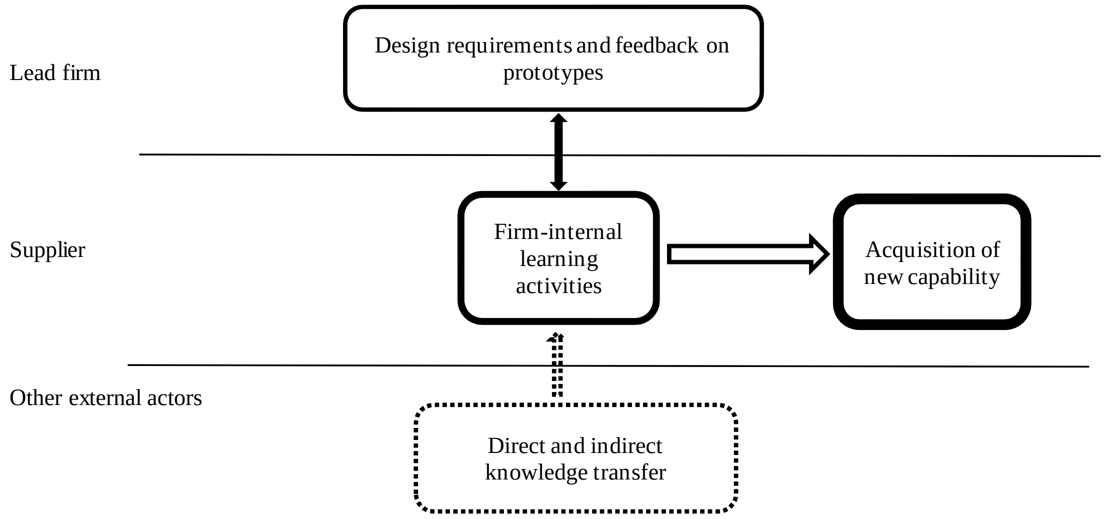
(a) Japanese Learning Model Variant 1



(b) Japanese Learning Model Variant 2



(c) Vietnamese–Chinese Learning Model Variant



Source: The author.

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 V16's relations with local assemblers were characterised by a *single* pattern of transactional governance. Nevertheless, given that value chains with contrasting governance patterns 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 to 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 (V13 and V14) had operated in Vietnamese–Chinese chain for extremely short periods. Even though V16 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 V16 #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).

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 thus 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.

8. Conclusion

This concluding section summarises the empirical findings corresponding to the two research questions introduced at the outset, and discusses the contribution of the paper to the wider body of literature on learning and innovation in developing country suppliers operating in a variety of value chains.

To reiterate, this paper began by enquiring: *How has local suppliers' capability building evolved since the late 1990s?* The existing empirical literature suggests that supplier learning is a steady and continuous process that progresses incrementally. However, my longitudinal analysis covering the period of a decade found that supplier learning was an evolutionary process involving major leaps, slow progress, and/or even halted learning at different points in time.

Regardless of the type of motorcycle production value chain suppliers participated in, the biggest leaps in capability level experienced by case suppliers were overwhelmingly concentrated in Stage III of industrial development – a period that is largely neglected in existing empirical analyses of the Vietnamese motorcycle industry. Yet, 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.

However, these results should be interpreted with caution. As cases were selected strategically, 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 (Papers II, IV), the cases of high performers analysed in Section 7 of the present paper 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.

The paper then enquired into why supplier learning trajectories evolved in the ways they did. The research question was: *What actor constellations and what knowledge flows led to critical learning events?* The literature emphasises constellations that focus on *either* of the two main actors: the lead firm as the key agent structuring learning opportunities in Japanese chains, or suppliers building capability independently in Vietnamese–Chinese chains. This paper 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.

Formulated as two distinct models of supplier learning and their adjustments over time, the findings showed that the changing roles played by both lead firms and suppliers 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 evolved into a two-way knowledge flow driven by attempts by suppliers to actively engage with a large number of their customers.

In summary, these empirical findings point to a much more dynamic picture 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. Such learning dynamics could only be gauged by means of the research design adopted in this paper, that is, longitudinal research covering a decade of rapid industrial development and consolidation; and which incorporated a sufficiently large number of cases to accommodate the increasing heterogeneity of learning trajectories across suppliers.

Apart from the above empirical contributions specific to the Vietnamese motorcycle industry, this paper also adds to the wider body of literature on firm-level capability building in the following ways. First, this study demonstrated the power of longitudinal research by showing that the timing of analysis has a profound impact on the judgement of capability building in small developing country suppliers. The existing literature is characterised by static analysis that associates each functional capability acquired with a certain type of value chain because research has 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 paper 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 paper 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 paper 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 observation.

Second, this paper 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 suppliers in shaping learning trajectories; and (2) an event-based methodology 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 key insight that emerges from this empirical longitudinal study is that suppliers are not just passive implementers of what lead firms demand; rather, through their own actions, suppliers may influence learning outcomes and/or even the sourcing strategies of lead firms. While lead firms may be more powerful, the dynamic is one of exerting mutual influence and mutual learning. Most importantly for developing countries, while lead firms have learned to continuously adjust their sourcing practices, some local suppliers have been on an even steeper learning curve, making huge advances in capability building.

PAPER IV. DOES CHINA'S ECONOMIC RISE HELP OR HINDER THE INDUSTRIAL DEVELOPMENT OF ITS NEIGHBOURS?

1. Introduction

There is growing interest in the effects of China's extraordinary industrial dynamism on its neighbours (Eichengreen 2006; Humphrey and Schmitz 2007). With its huge size, vast low-cost labour force, and deep industrial foundation, China has become a major producer of a wide range of manufactured goods (Yusuf et al. 2007) that is now moving towards the acquisition of innovation capabilities (Altenburg et al. 2008; Dahlman 2009). The impact of China's rapid economic growth is felt globally via international trade (Dimaranan et al. 2007). Thus, particularly amongst China's less developed neighbours trying to develop their own industries, one of the most pressing questions is: does China's economic rise help or hinder the industrial development of its neighbours?

The recent literature argues that the answer to the above question depends to a considerable extent on the status of the country (Eichengreen 2006; Humphrey and Schmitz 2007). According to these authors, Asia's more advanced nations benefit from the complementary effects of Chinese industrialisation. China's rise as a platform for labour-intensive international trade helps the industrial development of these countries because the exports of the former depend to a great extent on capital equipment and components sourced from such countries. Conversely, China's less developed neighbours suffer from the competitive effects of the other's growth. China's rise often hinders the industrial development of these countries as they specialise in labour-intensive industries in which China has come to play a dominant global role; while opportunities for exporting to China are limited in the main to unprocessed products.

This study acknowledges the above distinction as an important starting point, but attempts take the debate one step further. A critical element missing from the existing literature is the dynamics of change over time. To date, limited empirical research has shed light on how the impact of China's economic rise has shifted over time, and why it has done so. The present research paper seeks to fill these knowledge gaps, which it attempts by engaging in a longitudinal analysis of the Vietnamese motorcycle industry.

In the early 2000s, the industry was hit by massive imports of low-priced Chinese motorcycle components that imitated Japanese products, this so-called 'China shock' initially bringing about serious damage to the nascent local motorcycle production sector (Paper II). However, in the longer term, the competitive effects of this incident completely transformed the industry. Indeed, in 2005, a leading economist described the Vietnamese motorcycle sector as having "already achieved high degrees of scale merit, product quality and competitiveness" (Ohno 2005: 47) and "the only leading industry in Vietnam that can grow robustly without heavy reliance on exports" (ibid.: 48). Accordingly, the present paper examines the processes and mechanisms by which such severe competitive effects were transmuted into positive results.

Although the effects of the rise of Chinese manufacturing industries have been observed globally,[117] this paper focuses specifically on China's less developed neighbours. These countries depend heavily on imports from China[118] owing to their geographical proximity, some of them even sharing common borders with the former (Eichengreen et al. 2007). This means that nowhere else is the impact of Chinese trade felt more

[117] The literature analyses the impact of China's industrial development on Latin America (Moreira 2007; Alvarez and Claro 2009; Jenkins et al. 2009); Africa (Kaplinsky 2008; Kaplinsky and Morris 2009; Tegegne 2009); and South Asia (Sonobe and Otsuka 2010). Reference to this literature is made where relevant.

[118] Whereas the average level of dependence on Chinese imports for emerging and developing countries globally in 2010 was 9%, such a rate was 36%, 16%, 39% and 27% for Cambodia, Laos, Myanmar and Vietnam respectively (IMF 2011a).

strongly than in these countries.

The remainder of the paper is structured as follows. Section 2 reviews the existing literature and elaborates the research question. Section 3 discusses the research methodology. Section 4 presents the empirical analysis. Finally, the concluding section draws out the key insights derived from the study, and enumerates its limitations and areas for future research.

2. Literature Review

A growing literature has generated two contrasting views on how China's industrial dynamism affects industrial development of its neighbours. One view is that the rise of China helps industrial development of neighbouring countries. The focus of this stream of the literature is on the growing integration of East Asian economies propagated by regional production networks of TNCs from developed countries (Ando and Kimura 2003; Ng and Yeats 2003; Ando 2006). China has emerged as a major assembly centre for these regional production networks, but has so far depended largely on imported capital equipment, components, and technology (Gaulier et al. 2007). The proponents of this view contend that China's emergence as a major export platform benefits its neighbours as it has created opportunities for them to supply the necessary inputs for China's export production (Lall and Albaladejo 2004; Athukorala 2009).

The other view sees China's economic rise as a constraint to the industrial development of its neighbours because the impact of the former is largely competitive. Proponents of this view argue that China's huge production capacity combined with remarkable levels of price competitiveness exerts enormous economic pressure on firms in neighbouring countries in their home and/or third country export markets (Roland-Holst and Weiss 2004; Coxhead 2007).

Eichengreen (2006),[119] and Humphrey and Schmitz's (2007) attempts at synthesising these opposing views suggest a way of resolving the debate. By analysing trade data that differentiate trade in final and intermediate products,[120] these authors argue that the impact varies by country type. On the one hand, complementary effects are limited to more advanced neighbours that form integral elements of regional production networks as providers of the capital equipment, core components, and materials that China depends on. On the other hand, China's less developed neighbours are not positioned to gain from complementary effects because they are largely excluded from regional production networks. On the contrary, they suffer from cut-throat competition both at home and in export markets, as they specialise in labour-intensive industries in which China has attained such remarkable levels of competitiveness (Eichengreen 2006; Humphrey and Schmitz 2007).

Albeit helpful, the above synthesis still neglects a critical aspect of the impact of China's rise: the dynamics of change. Although to date, this element has not been a subject of empirical examination, the literature does suggest that China's impact may change over time. In terms of complementary effects, Lall and Albaladejo (2004: 1457) argue that China's impact may evolve as the country accumulates capabilities with regard to the production of the capital equipment, core components, and/or materials that it currently imports from its economically advanced neighbours.[121]

[119] Eichengreen et al. (2007) provide the trade data analysis on which this paper is based.
[120] The classification adopted differs by author but the underlying concept is the same. Athukorala (2009) employs a similar approach.
[121] Lall and Albaladejo (2004) do not offer a concrete answer as to whether or not this is a probable scenario. Athukorala (2009) also raises a related question concerning how long China's reliance on

There has been limited empirical research to date in respect of competitive effects. Nevertheless, several previous studies that have examined in general terms how competition with China has affected developing country producers provide useful insights. While there have been cases in which imports from China indeed displaced developing country producers (Alvarez and Claro 2009; Kaplinsky and Morris 2009), there have been other cases in which competition induced innovation responses amongst incumbent producers (Sonobe and Otsuka 2010). Tegegne (2009) found different responses even among producers in a single industry: small and medium shoe manufacturers in Ethiopia responded to Chinese imports by improving design, quality and response time, although micro enterprises reduced their production, labour force, and working hours. This means that the competitive effects of China may change depending on whether or not developing country producers strengthen their competitive edge vis-à-vis Chinese products.

In summary, we know from the existing literature that there are two contrasting views on the impact of China on its neighbours, one optimistic and the other pessimistic, and that the actual impact depends primarily on type of country and sector. The literature also suggests that such an impact may change as China and/or developing countries accumulate new capabilities and one group strengthens its competitive edge over the other. However, there has been limited empirical research on how China's impact on its neighbours has changed over time or why it does so. These are the knowledge gaps that this paper seeks to bridge.

As the existing literature suggests, the impact of China's economic rise vary considerably across sectors and countries. This paper focuses on the Vietnamese

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imported components can continue, concluding that such dependence will be sustained in the short to medium term, given the maintenance of China's comparative advantage in unskilled labour.

motorcycle industry as a sector that was affected heavily and early by massive imports from China. The research questions to be addressed are as follows:

Question 1: *How has China's impact on the Vietnamese motorcycle industry changed since the early 2000s?*

Question 2: *Why has China's impact changed in the ways it has?*

3. Methodology

Analysing how China's impact has changed over time poses a major methodological challenge. It cannot rely merely on the analysis of trade flows, as much of the research reviewed in the previous section has done. This is because it needs to understand what goes on inside firms and between firms in the countries affected.

To this end, this study focuses on two sets of value chains organised by lead firms competing for the Vietnamese market. One set of value chains – referred to as Vietnamese–Chinese chains – was organised by local Vietnamese motorcycle assemblers that were the key actors perpetrating the China shock. As the Vietnamese government had prohibited the imports of assembled vehicles, more than fifty of these firms entered into the assembly of imported Chinese motorcycle components in the early 2000s. Although the China shock only lasted a few years, quite a few of these assemblers continued to operate and eventually commenced the import-substitution production of low-priced motorcycles in Vietnam. This group is analysed both collectively and individually via the in-depth examination of six case assemblers (A1-A6) that were found to play significant roles at different points in time (Paper II).

The other set of value chains was organised by the Japanese motorcycle manufacturers that had dominated the Vietnamese market before the China shock. The study focuses primarily on HVN for two reasons. First, the company remained the single most dominant actor in the industry throughout the period of investigation (Paper II), which means that it had a major influence on the development of the sector. Second, HVN was most severely affected by the China shock and reacted with the most fundamental adjustments to its business model (Paper II), which makes the company particularly relevant in terms of the impact of the rise of China.

The analysis covers a period of a decade from the late 1990s. Whilst Papers II and III divided the historical development of the industry into three distinct stages, this paper further partitions the second stage into the period of the China shock and that of its immediate aftermath. This subdivision thus results in a four-stage classification as follows:

- Stage I (mid-1990s–1999): aims to show the status of the industry before the China shock
- Stage II(a) The China Shock (2000–2001): aims to show the actual events of the shock
- Stage II(b) The aftermath of the China Shock (2002–2004): aims to show the short-term consequences of the shock on the industry
- Stage III (2005–2009): aims to show how the impact of the shock changed the industry in the medium term

The study integrates industry-level and firm-level data. Industry-level data include published and unpublished statistics obtained from various organs of the Vietnamese government, and reports and research papers. Firm-level data comprise that on key actors in the two sets of value chains selected as in-depth case studies, which were obtained from repeated rounds of fieldwork conducted by the author in Vietnam and Thailand between 2001 and 2010. The comprehensive list of firms interviewed and surveyed is provided in Appendix 1. Interviews cited in this paper are referred to by firm and interview codes as explained in Appendix 1.

Details of the fieldwork and the full results of analyses of the dynamics of industrial organisation, and local suppliers' capability building using these data are compiled as Papers II and III respectively. The main task of the present paper is to synthesise the findings of these two studies, and complement them with additional data for the purpose of illuminating the processes and mechanisms linking China's economic rise and industrial development outcomes. The specific methods used to answer the two questions are as follows.

The first research question addresses the ways in which China's impact changed over time. This is explored by examining industrial development outcomes over the stages of industrial development specified above. Two sets of indicators are used to assess the extent to which Vietnam succeeded in developing competitive motorcycle assembly and component production industries. The first set of indicators is concerned with the market performance of Japanese and Vietnamese lead firms:

- Domestic market shares: This indicator shows the *relative* competitive performance of motorcycle manufacturers in the domestic market. However, its utilisation requires caution because, as we shall see, government regulations may occasionally distort market competition.
- Price level, product quality, and variety: The analysis of market performance indicators should determine the sources of lead firm competitiveness; they include

price level as well as the non-price indicators such as product quality and variety. Wherever possible, the performance of lead firms in Vietnam is compared with that of their regional competitors.

Since data collected at different times were not always based on the same set of quantitative measurements, the focus of this study was on the *direction* of change rather than the *degree* of change.

The second set of indicators focuses on the development of a domestic component supply base, which is analysed in this paper in terms of number of active suppliers, and the types and levels of capability[122] they acquired. Whilst large international 'follow-source' suppliers – i.e. those that pursue their customers' investment destinations – have emerged as key actors in developing countries (Humphrey 2000, 2003; Belderbos et al. 2000), local suppliers also have a critical role to play as agents of the host country's long-term industrial development, and should thus be distinguished from foreign-invested suppliers (Ivarsson and Alvstam 2004). Accordingly, nationality is an important consideration in analysing this study's data on suppliers.

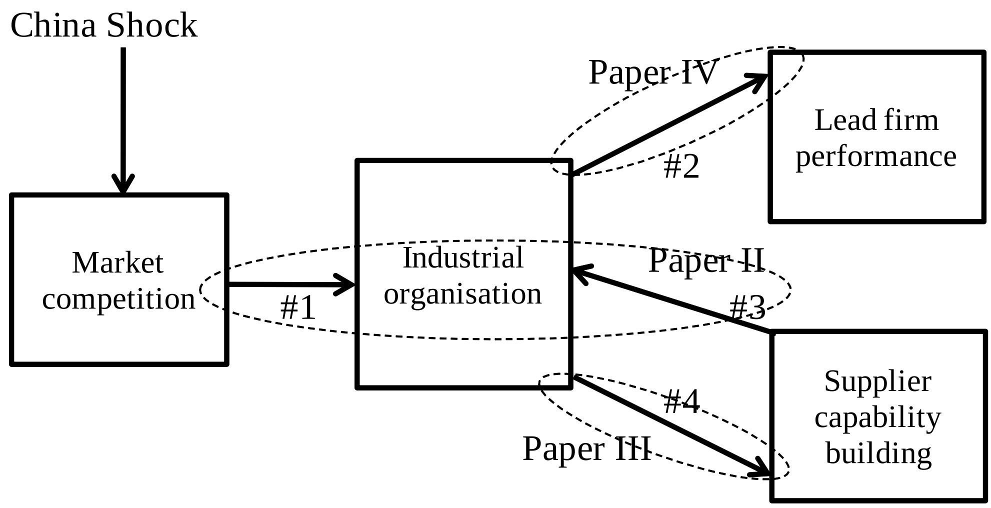
The second research question is concerned with why the Chinese impact changed in the way it did. In tracing the chains of causation linking the market competition triggered by the China shock and industrial development outcomes, this study introduces a mediating variable: industrial organisation. Much of the analysis involved in answering the second question involves integrating the findings of the two previous papers, which examined relations between four variables: market competition, industrial organisation, lead firm performance and supplier capability building. Figure IV-1 shows relations between the variables (indicated as arrows) and the sources of data on which the

[122] The classification of capabilities is discussed in Paper III.

analysis of the present paper is based.

Paper II provided findings on how industrial organisation was determined by market competition (arrow #1) and supplier capabilities (arrow #3). Paper III provided findings on how the building of supplier capabilities was influenced by the way in which lead firms coordinated relations with their suppliers (arrow #4). The present analysis of the relation between industrial organisation and lead firm performance (arrow #2) is based on additional data compiled for this paper using the aforementioned indicators.

Figure IV-1. Relations between Variables



Source: The author.

A critical point to note with regard to relations between variables is the cause and effect dynamic between industrial organisation and supplier capability building. That is, the building of supplier capabilities was not only an important development outcome in itself but also a key factor in influencing industrial organisation, or, more precisely, one of the prerequisites to the transformation of industrial organisation. As we shall see, the changing direction of causality between these two variables is central to explanation of the changing impact of the rise of China on the development of the Vietnamese motorcycle industry.

4. Findings on the Vietnamese Motorcycle Industry

This section presents the findings of the empirical research. It starts by discussing the status of the industry before the China shock. It then analyses what actually occurred during the shock, how its impact changed in both the short and medium terms, and why this impact changed over time. The section concludes by discussing future prospects for the industry.

4.1 Stage I: Before the China Shock

In the mid-1990s, the Vietnamese government launched an import substitution policy in respect of foreign-made motorcycles. Attracted by the growing market, the world's four major motorcycle manufacturers (Honda, Yamaha and Suzuki from Japan, and Sanyang from Taiwan) invested in Vietnam in the mid- to late 1990s.

At this stage, HVN was far from regionally competitive. Although Honda-brand products dominated the market, they largely constituted imports from Thailand and Japan (Paper II, Figure II-1); the fact that the Vietnamese government prohibited the importation of assembled vehicles in 1998[123] notwithstanding. HVN's products failed to compete against imported Honda-brand motorcycles because the company's made-in-Vietnam models were priced at roughly similar levels to Thai-made Honda-brand products (Table IV-1), which had high prestige with Vietnamese consumers (Nguyen Tran Que and Hoa Huu Lan 1998: 134).

[123] Prime Minister's Decision 11/1998/QD-TTg dated 23 January 1998.

Table IV-1. Regional Price Comparison of Honda Motorcycles

	Stage I	Stage II/China Shock	Stage III
HVN models	$2,100 (official price of the Super Dream in 1998)	$719 (official price of the Wave Alpha in 2002)	$1,564 (official price of the Click in 2008)
Honda-brand models made in Thailand	$2,300 (the Dream II imported from Thailand)*	$694 (official price of the Wave 100 in 2002)	$1,108 (official price of the Click in 2006)

Note: * Data on Honda-brand models made in Thailand in Stage I represent prices in Vietnam, not in Thailand.
Sources: *Oto-xe may (Automobiles and Motorcycles)*, August 2002: 39, January 2007: 100; Nguyen Duc Hien (2004: 234); Mizuno and Kitano (2000: 137); Mishima (2010: 216).

Moreover, the Vietnamese motorcycle component supply base was seriously underdeveloped. Apart from a limited number of foreign-invested suppliers that had followed Japanese and Taiwanese manufacturers to Vietnam, there were virtually no local specialised component suppliers at this stage (JETRO 1996; Chen and Jou 2002).

At this stage, HVN depended on a dozen Japanese and a handful of Vietnamese suppliers (Paper II, Table II-4). None of the latter had previous experience of manufacturing motorcycle components or serving global customers, but they gradually learned and acquired advanced production-related capabilities with generous technical assistance from HVN (Paper III).

In short, HVN was far from regionally competitive and the Vietnamese component supply base remained underdeveloped. However, none of the actors were compelled to adjust their strategies at this stage. After all, there were only a few players, all of whom manufactured products with largely similar attributes, that is, high-quality and expensive models transferred from other higher-income markets.

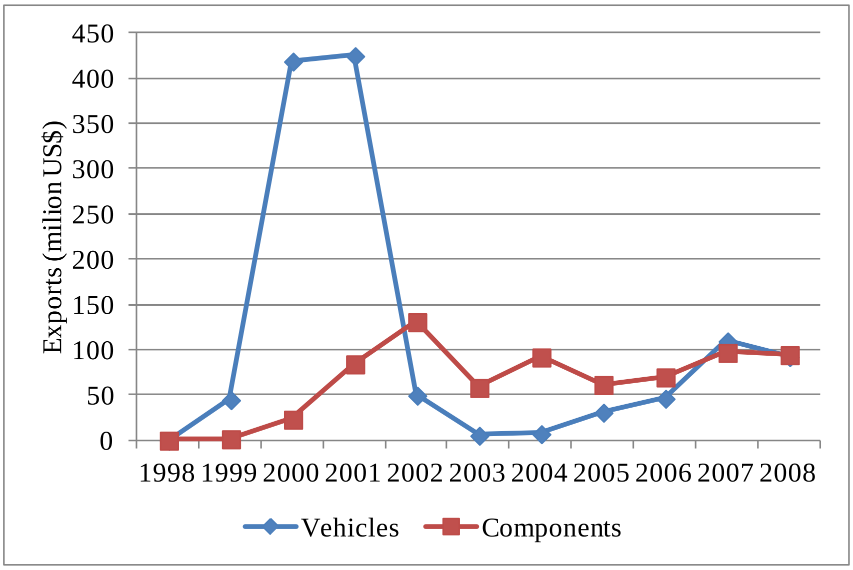
4.2 Stage II(a): The China Shock and its Immediate Consequences

On the basis of the above account, one would expect massive imports of low-priced

Chinese products to have had severe competitive effects on the Vietnamese motorcycle industry. Indeed, this is exactly what happened.

Figure IV-2 confirms the magnitude of the China shock, Chinese exports of motorcycles to Vietnam surging dramatically from 2000 to 2001. Similar to imported Honda-brand motorcycles in the late 1990s, these Chinese vehicles arrived in the form of knockdown component kits in order to circumvent the ban on the importation of assembled vehicles. Accordingly, more than fifty local Vietnamese firms were engaged in the assembly of Chinese component kits that were, in essence, copies or slightly modified imitations of a few popular Japanese base models (Paper II).

Figure IV-2. China's Exports of Motorcycles to Vietnam



Source: Global Trade Information Services, Inc. (2012).

Unsurprisingly, the China shock brought about a strong negative impact on the nascent Vietnamese motorcycle industry. With prices as low as half to one-third of domestically produced foreign-brand models,[124] Chinese motorcycles penetrated the medium- and low-income consumer markets that had remained unexploited by foreign motorcycle

[124] The average price of imported Chinese motorcycles was US$1,000–1,100 in 1999, but had fallen dramatically to US$500–600 by 2001 (Nguyen Duc Hien 2004: 236).

manufacturers. Having lost business to Chinese firms, all foreign manufacturers experienced a sharp drop in market share. Honda, in particular, faced its market share decline from 67% in 1998 (including 27% for HVN's domestically produced motorcycles and 40% for imported Honda-brand motorcycles) to 12% in 2001 (9% for the former and 3% for the latter) (Paper II, Figure II-1).

4.3 Stage II(b): The Short-Term Impact of the China Shock

The China shock caused severe damage to Vietnam's motorcycle production; however, this was not the end of the story. As discussed in Paper II, a number of important developments took place within a few years of the shock, the most prominent of which were HVN's launch of its new low-priced model in response to Chinese competition; and the initiation of import-substitution production of low-priced motorcycles by local assemblers in response to strengthened government regulations. The following subsections discuss how industrial development outcomes changed within a few years of the China shock.

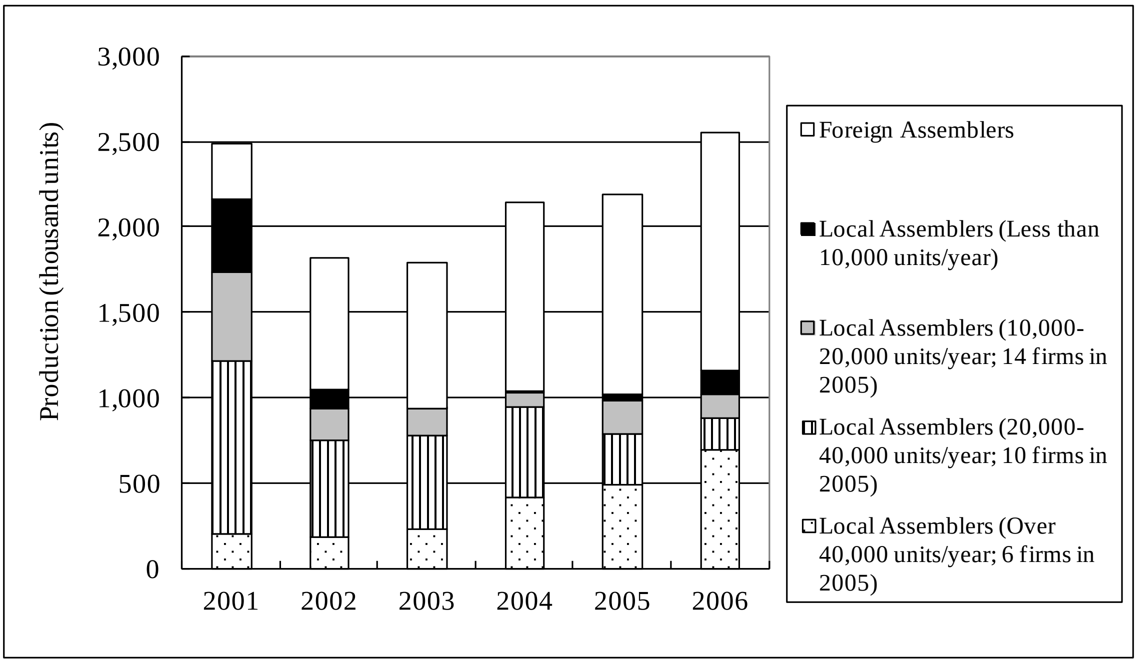
4.3.1 Market Performance of Major Lead Firms

The launch of the new Wave Alpha model helped Honda improve its market performance, shares rising from 12% in 2001 to 36% by 2004 (Paper II, Figure II-1). Unlike the 1990s, the 36% market share was now accounted for by HVN's domestically produced motorcycles, whilst the market shares of imported Honda-brand motorcycles had gone down to 0% (ibid.). This was achieved by remarkable improvement in HVN's price-based competiveness. The Wave Alpha was priced roughly one-third of its previous models and at a level broadly similar to an equivalent model launched in Thailand the same year (Table IV-1), whilst the vehicle's performance quality standards were only slightly modified – mostly downwards – to reflect the specific user conditions of Vietnam (Paper II; Amano and Shintaku 2010). However, further recovery was prevented as the company was unable to invest in additional production capacity. Consequently, HVN’s production increased substantially in 2002 but only modestly in the following two years (Paper II, Figure II-2).

In the meantime, the performance of local assemblers faltered, their combined market shares declining from 80% in 2001 to 30% in 2004 (Paper II, Figure II-1); suggesting that local assemblers *collectively* had lost out to HVN and other foreign motorcycle manufacturers. It naturally follows that local assemblers’ *individual* market shares were in an even more parlous condition, the 30% combined share of 2004 being achieved by numerous firms operating on a very small scale. For example, 60% of the motorcycles produced by local assemblers in 2004 were accounted for by those turning out 40,000 units or fewer (Figure IV-3).

However, such a decline in market share was not because local assemblers had lost their price-based competitiveness. On the contrary, the prices of their products were favourable even compared with those of Chinese imports. Table IV-2 shows the average prices of products for four of the six case assemblers for which data were available for the year 2004. Domestically, their vehicles were priced 25% to 55% lower than HVN’s low-priced model and at levels similar to the average unit price of China’s motorcycle exports. Rather, local assemblers lost their market share due to the low quality of their products. Their models failed to appeal to Vietnamese consumers who, after experiencing serious quality issues with Chinese motorcycles, increasingly opted for better-quality Japanese models (The Motorbike Joint Working Group 2007: 11).

Figure IV-3. Motorcycle Production of Local Assemblers by Scale of Production



Note: The number of assemblers producing less than 10,000 units per year in 2005 is not provided.
Source: The Motorbike Joint Working Group (2007: 27).

Table IV-2. Average Product Prices of Selected Local Assemblers (Unit: US$)

	A1	A2	A3	A4	A5	A6	Wave Alpha (HVN's low-priced model)	Average Unit Price of Motorcycles Exported by China
2004	365	451	n/a	439	622	n/a	819	374
2007	310	n/a	279	373	745	497	801	398

Source: Questionnaire surveys and interviews conducted by the author collaboration with the Vietnam Institute of Economics, Vietnam Academy of Social Science in 2004 and 2007.
The data on Chinese exports were calculated on the basis of data from Global Trade Information Services, Inc. (2012).

4.3.2 Development of Component Suppliers

The intense price-based competition triggered by the China shock combined with the strengthened enforcement of the local content rules compelled both HVN and local assemblers to explore low-cost component sources within Vietnam (Paper II). The result was a significant boost to the domestic component supply base as a whole.

On the one hand, important transformation was underway in HVN's value chains, as the launch of a low-priced model called for significant reduction in procurement costs. Since only limited numbers of Japanese suppliers had set up production in Vietnam, HVN inevitably found it necessary to mobilise non-Japanese suppliers (Paper II). As a result of an extensive search, provision of technical assistance, and capability building, HVN's portfolio of suppliers in Vietnam expanded from 16 in 1998 to 43 in 2004, local firms increasing from 5 to 13 over the same period (Paper II, Table II-4).

Another important development that took place within HVN's value chains was the emergence of second-tier component suppliers. Facing radical price reduction targets imposed by the lead firm upon the launching of the budget model, HVN's first-tier suppliers sought to replace imported subcomponents and materials with locally-sourced ones (Fujita 2007, 2011). Although the precise number of the resultant second-tier suppliers is unknown, Fujita (2007: 18) found that 6 of HVN's first-tier suppliers (3 Taiwanese, 1 Korean, and 2 Japanese) used an average of 27 second-tier suppliers in 2005, and that the single Korean firm traded with as many as 50 second-tier suppliers. Unlike first-tier suppliers, most of which were large SOEs, local second-tier suppliers included numerous private firms operating on a much smaller scale (Fujita 2011).

HVN's first- and second-tier suppliers not only increased in number but also improved their production-related capabilities. Progress was particularly remarkable amongst the former. First-tier suppliers started to progress from a rudimentary (*operational*) level of capability upon entry into an HVN chain, with some even reaching a more proficient (*assimilative*) level of capability in Stage II. Second-tier suppliers made more modest yet steady progress in improving their production-related capabilities (Paper III).

In the meantime, local assemblers steadily increased local sourcing in response to government policy requirements. Indeed, 29 of 45 assemblers operational in 2002–03 reached local content ratios of more than 40%[125] as they came to depend less on imported components. Local assemblers' dependence on imported components decreased significantly between 2000 and 2003 (Paper II, Table II-12).

This happened as a large number of suppliers entered Vietnamese–Chinese chains in response to high demand for standardised components without stringent quality requirements. Although precise figures are not available, a conservative estimate – made on the basis of official statistics – of the number of suppliers operating in such chains is 50 (Paper II, Section 6.1.2). This included (1) limited numbers of Taiwanese and Korean firms, most of which were specialist component suppliers already incorporated into the value chains of Japanese and/or Taiwanese motorcycle manufacturers; and (2) numerous local firms that had previously operated in related fields, for example, the production of motorcycle or bicycle spare parts (Fujita 2007; Paper II).

After entering a Vietnamese–Chinese chain, a local supplier acquired basic product introduction and production capabilities. In-depth analyses of sampled suppliers in such chains found that capabilities acquired were largely rudimentary (*operational* level), although they extended over a wide range of functions covering both product introduction and production (Paper III).

In summary, the local motorcycle industry started to show positive signs of recovery within a few years of the China shock. Lead firm competitiveness improved albeit subject to limitations; and the local component supply base grew, allowing ample space for Vietnamese firms to enter value chains and accumulate new capabilities.

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125 Based on a survey conducted by the National Economic University and Japan International Cooperation Agency (JICA) (Nguyen Duc Hien 2004: 259).

4.4 Stage III: Medium-Term Impact of the China Shock

Several years after the China shock, a new stage of industrial development began. The dismantling of interventionist policies that had repressed overall market growth and distorted competition generated significant development (Paper II). This was manifested as a major boost to the market as a whole; the rapid expansion of foreign motorcycle manufacturers, HVN in particular; and the struggle of local assemblers to respond to the penetration of HVN into the middle-income market. The following subsections discuss how industrial development outcomes changed as a result of such medium-term impact.

4.4.1 Market Performance of Major Lead Firms

In Stage III, HVN emerged as a dominant actor, accounting for roughly half of the Vietnamese motorcycle market in 2008 (Paper II, Figure II-1). This achievement was driven by the company's active attempts to seize the growing market by launching a variety of increasingly sophisticated models whilst achieving incremental quality improvement and cost reduction. From 2005 onwards, HVN launched a large number of new models (Paper II, Table II-8). The bulk of these were middle- to high-end vehicles featuring sophisticated designs, product performance, and/or quality, all of which combined to account for an ever more significant proportion of company sales.[126]

In terms of regional comparison, HVN's newly-launched models were priced 40% higher than similar models produced by Honda Thailand (Table IV-1). However, this anomaly was probably more due to the fact that the receding competitive threat of China in Vietnam meant that HVN was less compelled to implement an aggressive pricing

[126] As of 2004, the basic version of the Wave Alpha accounted for 70% of HVN's motorcycle sales. This proportion had dropped to 20% by 2007, when a greater proportion of HVN's sales was accounted for by high-end versions of the Wave Alpha as well as other higher-end models (interview with HVN #3).

strategy, rather than because HVN’s price competitiveness relative to Honda Thailand had deteriorated. On the contrary, the growing scale of HVN’s production, which even exceeded that of Honda Thailand in 2007 (Honda Motor Co, Ltd. 2010); the intense competition between suppliers; and the increasingly challenging performance targets that HVN imposed on suppliers (Papers II, III) suggest substantial improvements to overall productive performance at this stage.

The mounting dominance of foreign motorcycle manufacturers notwithstanding, local assemblers survived in the market because they improved their price- and non-price-based competitiveness, their collective market shares indeed rising from 30% in 2004 to 36% in 2005–06 (Paper II, Figure II-1). More importantly, local assemblers consolidated themselves into a small number of firms operating on a larger scale (Figure IV-3). For example, among those selected for in-depth case study, assemblers A1 and A3 sold a total of 300,000 and 95,000 units respectively in 2007 (Paper II, Table II-9), together accounting for approximately one-third of the total number of motorcycles sold by local assemblers that year.

In order to serve low-income consumers in rural areas that even HVN’s low-priced model had failed to penetrate, these assemblers further boosted their price-based competitiveness. Domestically, the products of assemblers A1 and A3 were priced at 39% and 35% respectively of HVN’s low-priced model; and regionally, the prices of their products in 2007 were even lower than the average unit price of Chinese exports (Table IV-2).

Moreover, A1 and A3 also increased the non-price dimensions of competitiveness. One of the striking features of these assemblers – as opposed to other local firms operating on a smaller scale – was the large variety of product designs they introduced (Paper II,

Table II-8). Although their models carried imitated Japanese designs and/or brands, a wide range of minor cosmetic modifications proved effective in penetrating the low-end consumer market (Paper II). There is also informal evidence to suggest that the quality of motorcycles produced by local assemblers had improved in comparison to the previous stage.[127]

4.4.2 Development of Component Suppliers

With a booming market and growing production volumes, Vietnam's component supply base experienced further development and consolidation. On the one hand, HVN further expanded local sourcing. Although the local content rules were abolished in 2003, and import tariffs on motorcycle components from ASEAN countries – including Thailand and Indonesia – on which HVN had been heavily dependent for supplies were reduced to 5% in 2006, HVN's local content ratio continued to increase, reaching 90% by 2007 (Paper II, Table II-4). Unlike the previous stage, this was achieved primarily by utilising foreign-invested suppliers and Japanese firms in particular (Paper II). Market growth combined with improvement in the overall investment environment[128] triggered the entry of numerous foreign suppliers (Paper II). As a result, local suppliers faced higher barriers to entry and intense competition.

Local assemblers adopted a somewhat different strategy. As the local content rules were abolished, local assemblers as a whole increased their dependence on imported components, reversing their previous move towards domestic sourcing. Following a

[127] In 2007, the general director of a Japanese supplier J6 pointed out that the performance tests of vehicles produced by local assemblers in Vietnam had found no substantial difference from genuine Honda-brand products when operated at normal speeds; although they were found to be much less reliable when operated at high speeds of 150 to 180km per hour (interview #2).

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

temporary decline from 2002 to 2003, their dependence on imported components increased after 2004 (Paper II, Table II-12). This suggests that local assemblers sought to exploit advanced component supply bases overseas.

However, within Vietnam, assemblers grew to depend on an emerging pool of highly competent suppliers equipped with the capability to reverse-engineer and implement cosmetic and functional modifications to Japanese component designs and to manufacture them in large scale to reasonable quality levels (Paper II). Of 22 Vietnamese, Taiwanese, Korean and Chinese suppliers in Vietnamese–Chinese chains interviewed by the author, four Chinese and one Vietnamese suppliers expanded their production by serving a considerable number of local assemblers (Paper II, Table II-11). Table IV-3 summarises their sales performance in 2007. In the meantime, faced with diminishing orders from local assemblers, many of the remaining suppliers transferred either to Japanese chains, where they operated mainly as second-tier suppliers, or to other industries (Paper II, Table II-11).

Table IV-3. Major Suppliers Serving Local Assemblers in Stage III

	Ownership	Component	Number of local assemblers served in 2007	Sales to local assemblers in 2007 (units sold and type of component)
C1	Chinese	Plastic covers, frames, lights, engines	43	860,000 (plastic covers and frames) 100,000 (engines)
C2	Chinese	Clutches, engine components	(n/a)	700,000 (clutches) 400,000 (engine components)
C3	Chinese	Frames	19	140,000 (frames)
C4	Chinese	Electric components	50	148,000 (ignition coils) 159,000 (starter relay) 160,000 (rectifiers)
V16	Vietnamese	Silencers	20	500,000 (silencers)

Note: Data on supplier V16 are for the year 2006.
Source: The author’s questionnaire surveys and interviews conducted in collaboration with the Vietnam Institute of Economics, Vietnam Academy of Social Sciences in 2007.

As local suppliers in both HVN and Vietnamese–Chinese chains faced intense competition in this stage, there were no longer a reserved space for them. Those in HVN chains had to compete with Japanese, Taiwanese and Korean suppliers; whilst those in Vietnamese–Chinese chains vied with Chinese suppliers. The result was a growing division between two groups of local suppliers: a handful of high performers that were rapidly accumulating capabilities and growing, and the rest, which lagged behind.

The former group included most of HVN's key first-tier suppliers and those firms that continued to receive large orders from local assemblers. These suppliers won orders for large proportions of the growing orders by HVN or local assemblers operating at large scales by acquiring increasingly sophisticated capabilities. The in-depth empirical analyses in Paper III found that seven of HVN's local first-tier suppliers and one in a Vietnamese–Chinese chain had reached *assimilative* or *adaptive* levels in the key capabilities required for their operations.[129] Whilst their numbers were limited, it is worth recalling the remarks of HVN's procurement manager, who stated that apart from a number of cases, its local first-tier suppliers were generally able to meet the company's requirements without the need for hands-on technical assistance by 2009 (Paper III); which by definition means that they had reached the assimilative level of production capability. This suggests that the above findings can be generalised to most of HVN's local first-tier suppliers, which numbered 18 as of 2007 (Table II-4).

The latter group included (1) those that stayed on as first-tier suppliers in Japanese or Vietnamese–Chinese chains but experienced declining orders as they failed to meet lead firm requirements; and (2) second-tier suppliers in Japanese chains that struggled to address the ever intensifying competition. These firms made relatively limited progress

[129] Suppliers V1, V2, V3, V7, V8, V12, V13 and V16.

in improving their capability levels (Paper III).

In summary, lead firm competitiveness was substantially boosted within several years of the China shock. In Stage III, HVN emerged as a dominant actor, but local assemblers continued to claim a market share by improving their price- and non-price-based competitiveness. The domestic component supply base continued to expand but, in a divergence from the previous stage, there emerged a growing rift between those suppliers that attained sophisticated capabilities and grew rapidly, and those that underperformed. Even though local suppliers were exposed to mounting competition, a few dozen of their number held on to positions in the former group by successfully acquiring production capabilities and even basic innovation capabilities.

4.5 Explaining the Changing Development Outcomes

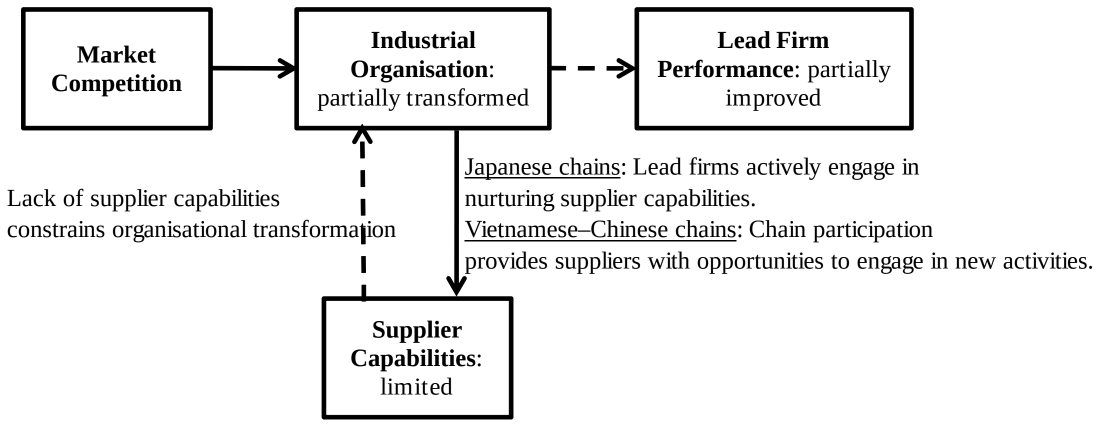
The foregoing discussion demonstrates that the impact of the China shock on the development of the Vietnamese motorcycle industry indeed changed substantially over time. What seemed at first to be severely negative effects eventually brought about remarkable improvements in the market performance and productive efficiency of major lead firms within the industry — developments that nobody could have imagined in the late 1990s. The country’s component supply base also developed remarkably, initially assisted by the entry of a large number of local suppliers, and subsequently driven by growing competition between foreign and local suppliers. Then, why did the impact of the shock change over time?

If we focus exclusively on the most immediate reaction to the shock, that is, HVN’s launch of its low-priced model, the answer is fairly straightforward: it can be explained in terms of HVN’s attempt to gain the competitive edge over Chinese imports – an argument corroborated by the existing literature on import competition reviewed in Section 2. However, the analyses in the ensuing subsections uncovered more extensive dynamics encompassing a wider range of actors, including local assemblers, suppliers of different nationalities, and the Vietnamese government, which cannot be reduced to the incumbent lead firm's response to the competitive effects of China. Explaining them requires a different perspective: industrial organisation.

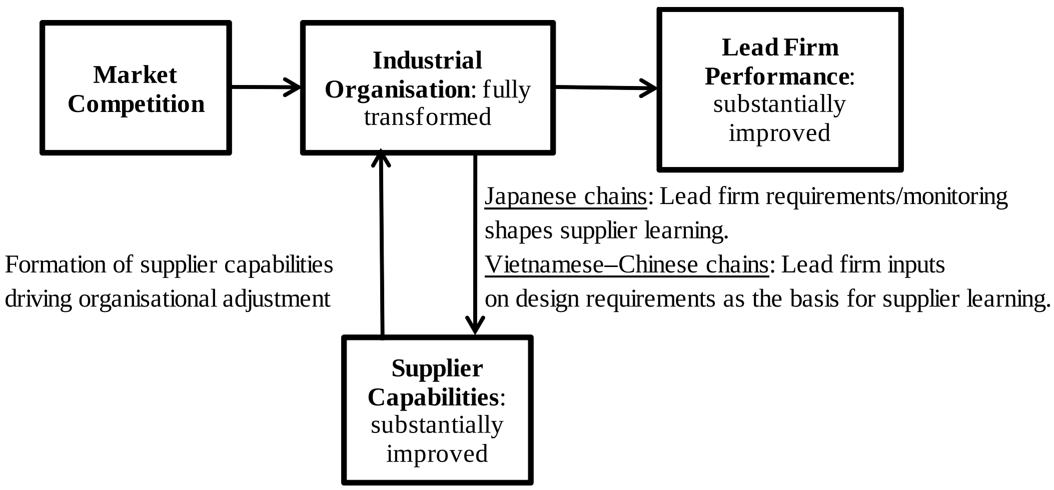
In the 1990s, the Chinese motorcycle industry rose to prominence due to its distinctive model of industrial organisation. Whereas the Japanese employed a *captive* organisational model to develop lead firm proprietary models and manufacture them to high quality standards for the sophisticated international market, the Chinese harnessed *market-based* organisation to achieve price-based competitiveness in producing copies or slightly modified imitations of Japanese motorcycles to meet the large demand for low-priced products in developing countries (Paper I). Vietnam was the first place outside China where the two models clashed and competed for supremacy. The transformation of the industry following the China shock can be explained in terms of the competition between the two organisational models.

Figure IV-4 shows the changing chains of causation linking market competition, industrial organisation, lead firm performance and the formation of supplier capabilities. In short, competition drove HVN and local assemblers to adjust their organisational models, which in turn influenced the two industrial development outcomes: lead firm performance and the formation of supplier capabilities. However, the directions of causal relations between the variables changed over time. It is this changing direction of causation between the variables that is vital to explaining the changing impact of China's rise.

Figure IV-4. Changing Chains of Causation in the Vietnamese Motorcycle Industry
(a) Stage II(b)



(b) Stage III



Source: The author.

In the immediate aftermath of the China shock, a combination of market competition and local content rules compelled both HVN and local assemblers to adjust industrial organisation so as to improve on their competitive performance. However, their attempts to adjust their respective organisational models only achieved partial progress at this stage because of the misalignment of relevant capabilities. Because the lack of supplier capabilities constrained the attempts of both HVN and local assemblers to make organisational adjustments, their market performance improved only partially.

Whilst HVN succeeded in achieving a radical one-off reduction in procurement costs, partial organisational transformation constrained sustainment of such a strategy. In Vietnamese–Chinese chains, the failure to attend the coordination needs surrounding de facto standard models ended up in local assemblers achieving low prices at the expense of low quality.

Nevertheless, lead firm endeavours to achieve the intended organisational transformation in the absence of foreign-invested suppliers created ample opportunities for local suppliers to enter value chains and acquire new capabilities. In HVN chains in particular, perceiving the lack of supplier capability as a constraint to the intended adjustment of its organisational model, the lead firm sought to nurture the required capabilities providing technical assistance. Suppliers in Vietnamese–Chinese chains were provided with the chance to engage in new activities and attain new capabilities – primarily as a result of their own efforts to mobilise internal or external resources.

In Stage III, further dynamics unfolded as the reverse causality came to operate; that is, the emergence of new supplier capabilities now increasingly drove the transformation of industrial organisation. The entry of Japanese and Taiwanese suppliers attracted by the growing market, as well as the improved capability levels of local suppliers, emerged as a key factor enabling HVN to take full advantage of 'institutionalised competition' to enforce challenging quality and price requirements on its suppliers. In the meantime, the emergence of Chinese and Vietnamese suppliers equipped with complementary competencies to conduct minor design modifications to existing models and to manufacture them in large quantities to reasonable standards gave rise to the 'coordination from below', which effectively addressed the coordination requirements surrounding de facto standard models in Vietnamese–Chinese chains.

As a consequence, HVN was now able to employ ‘institutionalised competition’ to impose challenging *quality and price* reduction targets on its suppliers, which enabled the company to meet the gradual sophistication of market demand and expand its market share. Nevertheless, several local assemblers managed to stay alongside the Japanese as organisational transformation enabled them to capitalise on the supplier-driven coordination to realise low prices, high product variety, and reasonable quality and thrive in the low-income segment of the Vietnamese motorcycle market that even HVN’s budget model had not penetrated.

Conversely, local suppliers were exposed to intense competition. Firms that continued to grow and upgrade were limited to those that had entered Japanese or Vietnamese–Chinese chains at the right time (i.e. Stage II, when competition between suppliers was not overly intense), and maintained their competitive edge vis-à-vis other suppliers in their respective chains by steadily building the capabilities required by lead firms. Accordingly, the few dozen suppliers that had taken full advantage of their participation in Japanese or Vietnamese–Chinese chains to acquire advanced capabilities emerged as core companies in the industry’s component supply base.

4.6 Looking to the Future

The Vietnamese motorcycle industry made significant headway within the decade covered by this study. Although the industry remains heavily protected, 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 has begun to turn.

Can Vietnam become regionally competitive in the Southeast Asian motorcycle industry? Although any answer to this question 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 2010, the three incumbent Japanese manufacturers (Honda, Yamaha and Suzuki) accounted for 76% of total motorcycle sales, while the share of local assemblers dropped to 8% (Industrial Research Institute 2011). Japanese motorcycle manufacturers continued to make large-scale investment in Vietnam[130] notwithstanding the government's announcement in 2008 of the reduction of tariffs on imports of motorcycles from ASEAN countries to 60% by 2013.[131]

Moreover, there are signs that the competitiveness of Vietnam's component manufacturing industry has also been significantly strengthened. In an interview at the beginning of 2010, the President of Honda's regional R&D base 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.

However, these new developments are giving rise to a new concern. While larger investment might make HVN even more efficient, its increasing dominance in the Vietnamese market could dissuade the company from making further efforts to improve its competitiveness. Given that the threat of local assemblers has weakened, the key question is whether there are alternative sources of competition strong enough to keep HVN's market dominance at bay. This is likely to depend on whether Yamaha – currently the second largest foreign motorcycle manufacturer operating in Vietnam –

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130 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).
131 Decision of the Ministry of Finance 36/2008/QD-TTg dated 12 June 2008.

and other foreign motorcycle manufacturers are able to seize the growing Vietnamese market, and how fast Vietnam can move towards the further reduction of import tariffs vis-à-vis other ASEAN countries and, perhaps more importantly, China.

5. Conclusion

This paper began by asking the question, does China's economic rise help or hinder the industrial development of its neighbours? The existing literature was found to be largely pessimistic about China's less developed neighbours that competed head-on with the former in domestic and third country markets. This paper challenged such a view by engaging in an in-depth longitudinal analysis of the Vietnamese motorcycle industry, which was hit by massive low-priced imports from China in the early 2000s. This concluding section summarises the contribution of the paper, discusses its limitations, and suggests issues for future research.

The key contributions of the paper are two-fold. First, it provides empirical evidence to show that the impact of China did change markedly over the decade. As expected, the China shock initially had a severe negative influence on the nascent domestic motorcycle industry. However, the detrimental effects were soon overcome and steadily turned into positive results. In the short term, domestic motorcycle production recovered as HVN significantly boosted its price-based competitiveness and the import-substitution production of low-priced motorcycles started to take root in Vietnam; but a series of interventionist government policy decisions imposed constraints on overall industrial development. However, this was also a period when ample space opened up for local suppliers – including small-scale private firms – to enter motorcycle production value chains and acquire new capabilities.

As policy constraints were removed in the medium term, the industry entered a qualitatively new development phase, with HVN emerging as an ever dominant actor. Yet, several very large local assemblers also clung on to their market share by catering to the lowest end of the market. The component supply base also continued to develop but this time, there was no longer a reserved space for local suppliers. As those of different nationalities competed intensely for orders, foreign-invested suppliers came to take on greater role in the country's component supply base. Nevertheless, a few dozen local suppliers continued to grow and upgrade by acquiring increasingly sophisticated capabilities, emerging as core companies in the component supply base.

The second contribution of this paper lies in its explanation of why the Chinese impact changed over time. The study reached beyond a narrow focus on the immediate response of incumbent firms to competitive effects – as was the case with the existing literature – and sought instead to explain how the impact of China's rise on industrial development outcomes changed in the medium term. The key to understanding these dynamics was the competition between two contrasting models of industrial organisation, that is, the Japanese model that prioritised quality, and the Chinese model that concentrated on price. The transformation of these two models was critical in explaining relations between market competition arising from the China shock, supplier capability building, and lead firm performance.

Faced with market competition, HVN and local assemblers sought to adjust their respective models of industrial organisation. However, such modification took time because intended changes were prevented from being made by initial inadequate supplier ability to support the sustained implementation of either organisational model. Nevertheless, in the medium term, a combination of policy change, attempts by lead firms to nurture supplier capabilities, and supplier's own learning initiatives paved the way for organisational adjustment that brought about remarkable changes in industrial development outcomes.

The overall conclusion of this paper is that assessing China's impact requires the tracing of changes over an extended period of time. What seem like negative effects on incumbent producers to start with might in the longer term be translated into a major boost to industrial development. However, such an outcome is clearly subject to strong entrepreneurship and the seizure of business opportunities by new entrants; the capacity on the parts of both incumbent firms and new entrants to invest in and build capabilities; and an environment (both domestic and international) that is conducive to strategic responses from all stakeholders.

Although this paper demonstrated that the time frame under study, the scope of coverage, and the depth of investigation each had a substantial influence on conclusions reached in terms of the dynamics of China's influence on its neighbours, the limitations of this research project should also be acknowledged. First, given that this study focussed on showing the *direction* of change and identifying critical junctures and mechanisms shaping the overall process of industrial development, further research is needed to explore the *degree* of change.

Much of the analytical work for this study involved the integration of principally qualitative data collected from lead firms and their suppliers at different points in time, which proved useful in illuminating the direction of medium-term change. However, data on local assemblers were generally limited in breadth and depth compared to those on HVN. With the exception of a few indicators such as market shares and prices, the consistent application of quantitative measurements to different stages of industrial development transpired to be unfeasible.

Indeed, data on suppliers' capability was limited to a purposefully selected sample of several firms, the analysis of which was designed to demonstrate the diversity of capability building trajectories, but did not indicate how prevalent emerging patterns were. To what extent did HVN's suppliers (of different nationalities) improve their productivity? How did such outcomes compare with the performance of suppliers serving local assemblers? Future research would require quantitative analyses of systematically sampled suppliers to address these questions, although such attempts are likely to be possible only over short periods of time.

Second, there are limitations in terms of the applicability of the overall findings to other contexts. The industrial dynamics that unfolded in the Vietnamese motorcycle industry had much to do with a combination of specific conditions, that is, (1) the presence of powerful TNCs that were strongly committed to seizing the emerging market and had the capacity to respond strategically to the Chinese challenge; (2) active entrepreneurship on the part of Vietnamese assemblers, without which *repeated* rounds of competition would not have taken place; and (3) a large pool of local and foreign-invested suppliers who actively exploited new transaction opportunities.

These conditions may not be present in many other industries or countries. Indeed, the emerging body of research on Chinese investment in Africa suggests that the absence of such conditions in this context has resulted in a situation in which Chinese investors either depend on imported inputs or develop enclaves in the host economies, both of which create limited spillover benefits for local firms (Broadman 2007; Gu 2009, 2011). However, there are cases in which Chinese imports have triggered innovative responses amongst local producers, for example, the electrical fittings industry in Pakistan

(Sonobe and Otsuka 2010) and the Ethiopian footwear industry (Tegegne 2009; Sonobe and Otsuka 2010). Therefore, similar lines of research might be useful to these and other sectors in order to shed light on whether the impact of China's growth on the development of local firms and industries has changed in the short and medium term.

Third and lastly, while this paper focussed on China's *competitive* impact, research is also needed on how and why China's *complementary* impact changes over time. To date, complementarity between China and its neighbours has grown as the former has needed inputs for export production. However, complementary effects might diminish over time as China acquires the requisite technological capacity to produce the parts and components it currently imports. Nevertheless, scope for exploiting complementarity may persist if the neighbours continue to improve on their technological edge.

Since complementary effects emerge from the regional production networks of TNCs extending to different countries in the region, research examining changes in such impact is most likely to benefit from applying the methodological approaches employed in the present study, that is, in-depth examination of key actors along the value chain; analysis of interaction between firms; and integration of firm-level and industry-level data. Although rarely adopted in research on China's impact on its neighbours, these are useful tools for analysing the complex interactive processes of market change, strategic response, capability building, and industrial development.

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APPENDIX 1 LIST OF FIRMS, INTERVIEWS, AND SURVEYS

1. Interviews in Japan (Paper I)

Firms	Code	Interview details
Honda Kumamoto Factory	#1	Managers of Operation Management Department and Motorcycle Factory Management Block; and Block Leader, Overseas Assistance Block, Motorcycle Factory on 27 July 2004 (includes factory visit).
Supplier JJ1	#1	President and four managers in charge of production, quality, and administration on 28 July 2004 (includes factory visit).
Supplier JJ2	#1	Director, Materials Department; Director, Technological Department; and Factory Manager on 26 July 2004 (includes factory visit).
Supplier JJ3	#1	Manager of Administration Department on 27 July 2004 (includes factory visit).

2. Interviews in Thailand (Papers II, III, and IV)

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.

3. Interviews in Vietnam

(1) Honda Vietnam (HVN) (Papers II, III, and IV)

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/Chief Financial Officer 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.

(2) Vietnamese Assemblers (Papers II, III, and IV)

Firms	Interviews		Surveys
	Code	Details	
A1	#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).	
A2	#1	Former procurement manager (2002-2004) at a café in Tokyo on 24 February 2009.	–
	#2	Former procurement manager (2002-2004) at the Institute of Developing Economies, Chiba on 27 February 2009.	
A3	#1	Officer of Administrative Department on 23 November 2007 (includes factory visit).	2007

A4	#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.	
A5	–	(Requests for interviews were rejected in 2004 and 2007.)	2004/ 2007
A6	#1	General Director and Deputy General Director on 26 November 2007 (includes factory visit).	2007

(3) Vietnamese Suppliers (Papers II, III and IV)

Firm	Code	Interview details	Paper*	
			II	III
V1	#1	Director of Planning Department on 17 October 2003.	X	X
	#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).		
V2	#1	President/General Director and Deputy manager of Personnel Department on 5 September 2008 (includes factory visit).	X	X
	#2	Director of Technical Department at the factory on 19 November 2008 (includes factory visit).		
V3	#1	General Director on 17 September 2008 (includes factory visit).	X	X
	#2	Deputy Manager of Technical Department on 20 November 2008.		
V4	#1	Vice General Director on 23 August 2002 (includes factory visit).	X	
	#2	Vice General Director on 3 September 2008 (includes factory visit).		
V5	#1	General Director on 16 October 2003 (includes factory visit).	X	X
	#2	General Director and Director of Technology Department on 9 March 2009 (includes factory visit).		
V6	#1	General Director on 17 November 2009.	X	X
V7	#1	Director of Production and Director of Finance on 25 September 2004 (includes factory visit).	X	X
	#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 at VEAM's office in Hanoi 13 January 2010.		
V8	#1	General Director at the company's factory on 20 November 2008.	X	X
	#2	General Director at the company's factory on 5 March 2009 (includes factory visit).		
V9	#1	Deputy General Director on 16 September 2008 (includes factory visit).	X	X
	#2	Manager of Engineering Department on 21 November 2008 (includes factory visit).		
	#3	General Director at the VEAM's office in Hanoi on 13 January 2010.		
V10	#1	Managing Director on 28 July 2005 (includes factory visit).		X
	#2	President on 15 November 2008 (includes factory visit).		

V11	#1	General Director and Director on 9 September 2008 (includes factory visit).		X
V12	#1	Manager of Finance and Deputy Manager of Sales on 12 March 2009 (includes factory visit).		X
V13	#1	Deputy General Director on 16 September 2008 (includes factory visit).	X	X
	#2	Managers of Technical Department, Equipment Department, Manager of Quality Control Department, and Technical Department No.2 on 21 November 2008 (includes factory visit).		
V14	#1	Director and Manager of Technology Department at the company's factory in Ho Chi Minh City on 13 March 2009 (include factory visit).	X	X
V15	#1	General Director at the company's factory in Hanoi on 3 August 2005 (includes factory visit).	X	X
	#2	General Director at the company's factory in Hanoi on 5 September 2008 (includes factory visit).		
V16	#1	General Director on 24 November 2008.	X	X
	#2	General Director on 5 March 2009 (includes factory visit).		
V17	#1	General Director and Director of Sales Department on 12 September 2008 (includes factory visit).	X	X
	#2	General Director and Manager of Accounting Department on 22 November 2008 (includes factory visit).		
V18	#1	Director on 4 September 2008 (include factory visit).	X	X
V19	#1	General Director on 2 August 2005 (includes factory visit).	X	X
	#2	General Director on 8 September 2008 (includes factory visit).		
	#3	General Director on 10 March 2009.		
V20	#1	General Director on 15 September 2008 (includes factory visit).	X	X
	#2	General Director on 10 March 2009.		
V21	#1	General Director on 4 March 2009.	X	X
V22	#1	Managing Director and Factory Director on 14 March 2009 (includes factory visit).	X	X
V23	#1	Deputy Director on 25 September 2004 (includes factory visit).	X	

(Note) * This column shows papers in which data on the respective supplier is used for analysis. Paper IV synthesises the findings of Papers II and III. V10, 11 and 12 are second-tier suppliers in HVN chain and therefore beyond the scope of the analysis of Paper II. V4 and V23 could not be accessed for in-depth interviews on capability building trajectories for Paper III.

(4) Japanese Suppliers (Paper II)

Firms	Code	Interview details
J1	#1	General Director on 1 August 2005 (includes factory visit).
J2	#1	General Director on 23 August 2002 (includes factory visit).
	#2	General Director on 26 November 2007 (includes factory visit).
J3	#1	General Director on 20 September 2004 (includes factory visit).
	#2	General Director on 19 November 2007.
	#3	General Director on 18 September 2008 (includes factory visit).
J4	#1	General Director on 22 May 2003.
J5	#1	General Director and Factory Manager on 11 November 2003 (includes factory visit).

J6	#1	General Director on 20 November 2004 (includes factory visit).
	#2	General Director, Director and Manager of Purchasing Department on 20 November 2007 (includes factory visit).
J7	#1	General Director on 4 September 2002.
J8	#1	General Director on 27 July 2001 (includes factory visit).
J9	#1	General Director on 26 November 2007 (includes factory visit).
J10	#1	General Director on 17 September 2008 (includes factory visit).
J11	#1	General Director on 15 January 2010 (includes factory visit).

(5) Chinese Suppliers (Papers II and IV)

Firm	Interviews		Surveys
	Code	Details	
C1	#1	General Director on 23 November 2007 (includes factory visit).	–
	#2	Manager of Sales Department at a café in Hanoi on 2 March 2009.	
	#3	Manager of Sales Department at a café in Hanoi on 11 March 2009.	
C2	–	–	2004/2007
C3	–	–	2004/2007
C4	–	–	2004/2007
C5	–	–	2004

(6) Taiwanese suppliers (Paper II)

Firm	Code	Interview details
T1	#1	Japanese Technical Advisor on 26 July 2005 (includes factory visit).
	#2	Deputy General Director on 28 November 2007.
T2	#1	Sales and Import Assistant Manager on 27 November 2007.
T3	#1	General Director on 3 August 2005.
	#2	General Director on 6 March 2009 (includes factory visit).
T4	#1	Deputy General Director and Manager of Sales Department on 27 November 2007.
T5	#1	Deputy General Director on 29 July 2005.
T6	#1	Director of Finance Department on 10 September 2004 (includes factory visit).
T7	#1	Deputy General Director on 28 July 2005 (includes factory visit).

(7) Korean Supplier (Paper II)

Firm	Code	Interview codes and details
K1	#1	Chief of Financial Department on 10 September 2004.
	#2	General Director on 29 November 2007.
	#3	General Director on 13 March 2009.

(8) Industry Experts

Organisations	Code	Interview details
Vietnam Association of Bicycles and Motorcycles (Vinacycle)	#1	Specialist on 23 September 2004.
	#2	Chairman and Chief of Administrative Office on 21 November 2007.
	#3	Chief of Administrative Office on 15 January 2010.

(9) Motorcycle Retailers (Paper II)

Organisations	Interviews
Hanoi	Several motorcycle retailers on Hue Street, Hanoi interviewed on 27 August 2002.
	Several motorcycle retailers on Hue Street, Hanoi interviewed on 13 January 2010.
Long An Province	Several motorcycle retailers in Tan An, Long An on 25 July 2005.
Ho Chi Minh City	Several motorcycle retailers in Ho Chi Minh City on 11-12 September 2004.

APPENDIX 2 INTERVIEW SCHEDULE FOR LOCAL SUPPLIERS

Date:____________________________

Company Name:____

Address:____

Phone Number:____

Interviewee (name, title & department, length & experience of working for the firm):

____

I. Basic Information about the Firm

1. When was the firm established? Who were the founders, and how was the firm established?

____

2. What is the company's legal status? Who owns the firm? _________________________

____

3. Production Facilities/Factories: Please describe the firm's production facilities/factories

Address (IZ)	Year Constructed	Land Area	Items produced	Production capacity

4. Number of Employees

		Current (2008)	2003	2000
Administration				
Production of Motorcycle Parts	Engineers			
	Supervisors			
	Operators			
	Others			
Designing & Manufacturing Mold				
Other production…………………..				
Other sections ……………………………				
Research & Development				

5. Trend of Sales: What is the trend of the firm's performance (sales and profits) over the past 10 years? What is the current structure of sales in terms of products? How have the firm's main products changed over the past 10 years?

	2007	2002	2000
Total sales (mil. VND)			
Of which (%):			
Motorcycle components	…………	…………...	…….………
for: Japanese assemblers:____________________	……………	……………	…….………

Foreign suppliers: ________________________	……………	...…………	…………..…
Vietnamese assemblers: __________________	……………	…...………	…………...
Others: _________________________________	……………	……...……	…………….
Replacement Parts	…………….	……….... …	……………..
Other products & services	……………..	…………...	……………..

6. Production processes: Which production processes does the firm undertake? Please write the year in which the firm started to undertake the production process in the parenthesis?

(1) Engine Assembly ( ); (2) Die-casting ( ); (3) Machining ( );
(4) Cutting ( ); (5) Stamping ( ); (6) Welding ( );
(7) Forging ( ); (8) Plating ( ); (9) Heat Treatment ( );
(10) Plastic injection moulding ( ); (11) Painting ( ); (12) Others _____( )

Do you design/produce moulds in-house?

Yes [Type of moulds:______________ Year started: _________________] No

7. Product structure

	Names of products	Year Started	Names of Main Customers	In case of Japanese assemblers: Which models?
Motorcycle parts				
Products other than motorcycle parts				

8. Please summarise the firm's business overall strategy over the past 10 years (e.g., focus in terms of products, customers, and investment).

____

II. <u>Key Customers of Motorcycle Components and Value Chains Governance</u>

9. Name of Customer ____

10. How has the relationship with this customer developed? Please describe the process, referring to different phases if necessary.

____

11. How difficult would it be for this firm if the relationship stopped tomorrow?

____

12. For this customer, is the firm the only supplier of the type of the components you supply?

____

13. Please describe the process through which this customer chooses components suppliers for new models and signs contracts with them.

____

14. How are product specifications defined by the customer, and how are they given to you? Does the customer provide specifications other than product specifications, such as specifications on materials, machinery and equipment, or production process to be used?

___

15. How often, via what channels, and how intensively do you communicate with this customer?

___

16. How often did the staff of this customer visit your firm (at different phases)? What did they do at your firm?

___

17. What does the customer provide you apart from the opportunity to sell (e.g., financial assistance, machinery and equipment, technical assistance)?

___

18. How often and regarding what issues do you consult with this customer? How do they help you?

___

19. What does this customer demand most from you? What is the most important factor in sustaining relationship with this customer?

___

20. How are the prices decided? Are they reviewed regularly? How?

___

21. Have you ever made any investments specifically for this customer (e.g., factory, machinery and equipment, human resources, and dies and moulds)? What motivated you to make the investments? Had the customer given you assurances of the future contracts, orders, or relationships?

___

III. Identification of the Most Important Learning Incidents

Since the firm started to produce motorcycle components, when did the methods of introducing new products, engaging in equipment-related activities, or conducting production management change the most? What was the firm able to do as a result of these incidents? [Identify up to three most important learning events, using the Capability Matrix (Table III-1) to assess the degree of improvement in capability levels.]

Event 1:___

Event 2:___

Event 3:___

Event 4:___

IV. Details of Learning Incidents

22. Name of Event ___

23. Start & End dates ___

24. Who took the lead of this event in this firm? What was his/her role? Who else were involved? What were their respective roles? What was your role?

___

25. Was the event related to the following dimensions? What was the firm able to do as a result, and how was it different from what the firm had previously been able to do?
(1) Product development/design

____

Evaluate the firm's new product introduction capability at this stage:_________________

(2) Organisation of production

____

Evaluate the firm's production process capability at this stage:___________________________

(3) Levels of precision; design and improvement of production processes; maintenance and manufacturing of dies, moulds, tools and jigs

____

Evaluate the firm's equipment capability at this stage:__________________________________

____

26. Did you do any of the following prior to or during the event?

☐Investment in machinery/equipment

☐Recruiting new staff ☐Trainings staff

☐Other efforts ____

____

27. Are any external parties involved in the event, such as suppliers of components and materials, subcontractors, suppliers of machinery/equipment, design drawings, dies/moulds, competitors, consultants, advisors, related companies, banks, universities or research institutes, government or international organisations, donors, or industrial associations? Please describe how they were involved.

____

28. What types of problems or challenges arose during the process, and how were they resolved?

____

29. Of various actors involved in the event, who played the two most important actors? Please evaluate their importance in terms of percentage of efforts involved.

Most important actor:____________________________________

Second most important actor:______________________________

30. How was the new knowledge utilised for the firm's business? How important was it for the firm in differentiating itself from the competitors?

____

31. Was this learning incident subsequently followed by further improvements in new method of product introduction, maintaining, equipment-related activities, or organising production processes? [Try to identify the chains of learning incidents/ process.]

____

* Repeat the sections in IV. for the number of learning incidents identified.

APPENDIX 3 QUESTIONNAIRE FOR SURVEY OF LOCAL ASSEMBLERS

Vietnam Institute of Economics
Vietnam Academy of Social Science

Questionnaire for Motorcycle Assemblers

The purpose of this survey is to better understand the current situation of motorcycle industry in Vietnam. Information of your company will be treated as strictly confidential and the information you provide will be used for research only. Neither you nor your company's name will be used in any document prepared based on this survey.

Part I: General Questions
(Questions to be answered by the Manager of the Administrative Section)

Date of Interview: ___________________________
Interviewee's Name: ___________________________
Interviewee's Title & Department: ___________________________________
Contact Phone Number: ______________________________
Interviewer's Name: ___________________________

1. Company's General Information
1.1 Company information
Company Name ___________________________
Name for international transaction ________
Establishment year _________ Registered Capital _______________mil. dong
Address ____
Phone number ___________________________ Fax number ________________________

1.2. Legal status of company (mark x in appropriate cell)

	At establishment	At present
a) Central SOE		
b) Local SOE		
c) Belonging to social organization		
d) Cooperative		
e) Share holding company		
f) Limited liability company		
g) Collective company		
h) Private company		
i) Joint venture		
j) Foreign invested company (100%)		
k) Other (specified):		

1.3. If legal status of company has changed, please indicate the year of completion:_____
1.4. If a foreign invested firm, please fill in:
Name of mother company _____________________________ Country _______________

1.5 Please indicate the details of your factories (including motorcycles and others).

Address	Items produced	Production capacity (units/year)	Operating since (year)

1.6 Please indicate the details of your company's subsidiaries in or outside of Vietnam, if any.

Name of company	Address (district, province)	Activities	Operational Status (Please tick X)		
			Not yet operating	Operating	Stopped operating

1.7 Please let us know some information on Management Board

Job title	Nationality	Age	Male/ Female	Education (codes under the table)	Working for company since (year)	In this position since (year)

(Graduate/Post-graduate = 1, College/technical school = 2, High school = 3, Technical worker = 4, secondary school = 5, other = 6

1.8 Please list all the business associations your company belongs to.

____

1.9 Employment

A. How many workers were employed on average in the past two years?

	2006 (persons)	2007(persons)
Admnistrative Section		
Motorcycle Section		
Other manufactring section: Please specify …………………		
Other Sections (e.g., services)		
Total		

B. Average wage for engineers: _____________ dongs/month

C. Average wage for workers:_____________ dongs/month

2. Finance and Overall Performance

Enterprise's Income in 2007: ________________________ dongs

Structure of income:

	2006	2007
Sales: motorcycles	%	%
Sales: motorcycle parts	%	%
Sales: other manufactured products	%	%
Income from service	%	%
Other source of income	%	%
Total	100%	100%

2.2 Outsourcing ratio

What are the shares of (A) materials, (b) components and parts, and (C) payment to subcontractors in your total production cost?

	2007
(A) Materias	%
(B) Components and parts	%
(C) Payment to Subcontractors	%
(A)+(B)+(C): Outsourcing Ratio	%

2.3 Evaluation of Overall Performance

What has happened to your company during 5 years from 2003 to 2007? Please circle "+" if it increased, "-" if it neither increased nor decreased, or "-" if it decreased.

Output of motorcycles (Volume)	−− − = + ++	Unit price of your company's motorcycles	−− − = + ++
Sales of motorcycles (Value)	−− − = + ++	Variety of your company's motorcycles	−− − = + ++
Net profits from motorcycle sales	−− − = + ++	Ratio of Net Profits to Sales from motorcycle business	−− − = + ++

Thank you very much for your cooperation!!

Part II: Questions on Product Development, Production and Sourcing
(Questions to be answered by Manager Responsible for Technology and Production)

Date of Interview: _________________________
Interviewee's Name: _________________________
Interviewee's Title & Department: ________________________________
Contact Phone Number: ____________________________
Interviewer's Name: _________________________

1. Production

1.1 Which production processes does your company undertake? (Please circle all the numbers that are appropriate.)
1.Motorcycle Assembly; 2.Engine Assembly; 3.Diecasting; 4.Machining; 5.Cutting;
6.Pressing/Stamping; 7.Welding; 8.Forging; 9.Plating; 10.Heat Treatment; 11.Grinding
12.Plastic injection moulding; 13. Painting; 14.Others ____________________________

1.2 Production Level: motorcycles, parts and others

Do you produce the following products? Please write the names of products.		Year starting production	Do you export this product?	Actual production (2006)	Actual production (2007)
Motorcycles	Motorcycles ☐Yes ☐No		☐Yes ☐No		
	Scooters ☐Yes ☐No		☐Yes ☐No		
Parts (Fill in names of parts)			☐Yes ☐No		
			☐Yes ☐No		
			☐Yes ☐No		
Other products			☐Yes ☐No		
			☐Yes ☐No		

1.3 If you produce motorcycle components, do you sell them to other firms?
☐ No (i.e., all components are used for assembly in our factory only).
☐ Yes. We sell approximately _____ % of the components we produce to other firms.

2. Products and Product Development

2.1 Please fill in the number of motorcycle models your company launched in each year.

Year	2003	2004	2005	2006	2007
Number of new models launched					
Production (units)					

2.2 How many models do you currently produce?_________________ models
2.3 What is the average retail price of your products now?_________________ dongs
2.4 Please let us know your product development process.
A. Do you develop new products by copying and modifying the existing models of other companies,

or by developing a new model from scratch?
☐We copy and modify existing models.→ Please go to Question B.
☐We develop a new model from scratch.→ Please go to Question C.

B. Whch specific components do you mainly modify?

____

- Who designs the modified components? (Please tick the appropriate box.)
☐ Your company → Please go to Question D.
☐ The supplier → Please go to Question C.
☐ Your company cooperates with the supplier. → Please go to Question C.
☐ Others ___________________

- Who prepares the mold for the modified components? (Please tick the appropriate box.)
☐Your company; ☐The supplier
☐Your company buys from another company.
☐The supplier buys from another company.

C. Do you make requests to the supplier regarding how the components should be improved?
☐ Yes. ☐ No. We completely leave the design to the supplier.

What do you provide the supplier when you order the components? (Please tick the appropriate boxes.)
☐Sample ☐Drawing ☐Mold ☐Requests about appearance
☐Documents on technical specifications ☐Khác ___________________________

How many times on average do you exchange ideas with the supplier in the process of developing a certain model?
☐None (Your company accepts the component as designed by the supplier.)
☐Once (Your company gives comments on the sample once.)
☐Twice ☐Three times or more

How has the frequency of interaction with suppliers changed during the past 5 years?
☐Increased ☐Has not changed ☐Decreased

D. How do you collect information about market demand for your product development (from what sources, by which method, and how often)?

____

____

2.5 On average, how long does it take for your company to develop a new model (from start of planning to launching of the new product)? ______________ weeks / months

How has the period of product development changed compared to 2-3 years ago?
☐Has become longer ☐Has not changed ☐Has become shorter

3. Sourcing & Relationship with Suppliers

3.1 Please list the types of components and parts that you manufacture in-house.

____

Approximately how many percent do these components and parts account for in the total value of the motorcycles? ___________%

3.2 Currently how many suppliers (in Vietnam or abroad) do you use in total?

Total number of suppliers:____________

Of which: Suppliers in Vietnam:_________ Suppliers abroad:____________

Approximately how many of them did you start transaction with in the last one year? ________

In the last two years? _________________

3.3 Between 2003 and 2007, how has your company's sourcing of components changed? Please indicate "++" if the share (in terms of value) increased substantially, "+" if it increased, "=" if it neither increased nor decreased, "-" if it decreased, and "--" if it decreased substantially.

In-house production of components	-- - = + ++
Sourcing from Vietnamese firms	-- - = + ++
Sourcing from Taiwanese firms in Vietnam	-- - = + ++
Sourcing from Chinese firms in Vietnam	-- - = + ++
Imports: Which countries?________________________	-- - = + ++

3.4 The following are questions about the relationship with the suppliers of **parts that are specifically designed for each of your models** (see your answer to **Question 2.4B**). Please answer the questions about your relationship with suppliers of the **most important component in this category**. Name of component:___________________________

A. <u>Currently</u> how many suppliers do you source this component from? _______

How many suppliers have you ordered this component from over the <u>past two years</u>?

____

B. What is the share of the largest supplier in the total value of procurement for this component? _________ % The share of the three largest suppliers? ________ %

C. What are the nationalities of the three largest suppliers? (Please tick appropriate boxes.)

	Vietnamese firms	Chinese firms in Vietnam	Taiwanese firms in Vietnam	Firms abroad (Pls specify the country.)
The largest supplier				
The 2nd largest supplier				
The 3rd lagest supplier				

D. How long have you had transactions with the largest supplier? ______years/ months

With the second largest supplier?_______năm / tháng

E. If your largest supplier suddenly stops supplying components to your company for some reason, is it easy for your company to find alternative suppliers? ☐Yes ☐No

F. Is there a written contract with the largest supplier? ☐Yes ☐No

If yes, for how long?_______________

Does the contract specify the following? (Please tick only if applicable.)

☐Price ☐Quantity of order

G. On average, how frequently do you place orders to the largest supplier?
___________ time(s) a day / week / month (Please circle the appropriate unit.)

H. On average, how frequently do you receive deliveries from the largest supplier?
___________ time(s) a day / week / month (Please circle the appropriate unit.)

I. Do you inspect the quality of the incoming parts from the largest supplier?
☐We inspect all. ☐We inspect only a portion. ☐No inspection.

In case you conduct inspection, by what method?
☐By sight ☐ By testing machine ☐Other _______________________

J. What do you do if you find quality problems with the components after they were delivered from the largest supplier?
☐We inform the supplier what is wrong with the product and ask them to fix the problem.
☐We ask the supplier to replace them with products of satisfactory quality, but do not report to them about the details of the problem.
☐We discard the defect components, and order from another supplier.
☐We have not had any cases like that.
☐Others____

K. Do you provide your largest supplier with the following assistance? (Please tick as many as applicable.)
☐Advance payment ☐Share the cost for mold production (____ % of the total cost)
☐Share the cost of investment in machinery/equipment (____ % of the total cost)
☐Technological assistance (e.g., quality control or production process)
☐Training ☐Consultancy ☐Others ____________________

L. How often do the staffs of your company visit the largest supplier?________________

M. How often do the staffs of the largest supplier visit your company?_______________

3.5 The following (A to H) are questions about your relationship with the suppliers of general parts that are used in common for your models.

A. On average, how many suppliers do you use for each type of components?
☐One ☐Two to three ☐Four or more

Why is it advantageous for you to have one/two to three/many suppliers for each component, as you just answered?
____

B. Do you switch suppliers of general parts often? Under what occasions do you switch suppliers?__

C. When you place an order, how do you specify the components? If you have different answers for different types of parts, please tick all the boxes and specify the examples of parts for each answer.
☐Just by the type of the component (e.g., “clutch”) Type of parts:___________________
☐The types of models (e.g., “Wave” type): Types of parts__________________________

☐Other method. Please specify.____

D. If your supplier suddenly stops supplying components to your company for some reason, is it easy for your company to find alternative suppliers? If there are any types of components for which it is difficult to find an alternative supplier other than your current supplier(s), please specify the names of the parts.____

E. Is there a written contract with your suppliers? ☐Yes ☐No
If yes, for how long?_______________
Does the contract specify the following? (Please tick only if applicable.)
☐Price ☐Quantity of order

F. Do you inspect the quality of the incoming parts from the suppliers? If it depends on the type of parts, please tick all applicable asnwers and write examples of the types of parts after each answer.

☐ We inspect all:____
☐ We inspect only a portion.____
☐ No inspection.____

In case you conduct inspection, by what method?

☐By eyes ☐ By testing machine ☐Other _____________________

G. What do you do if you find quality problems with the components after they were delivered from the suppliers?
☐We inform the supplier what is wrong with the product and ask them to fix the problem.
☐We ask the supplier to replace them with products of satisfactory quality, but do not report to them about the details of the problem.
☐We discard the defect components, and order from another supplier.
☐We have not had any cases like that.
☐Others____

H. Do you provide your suppliers with the following assistance? (Please tick as many as applicable.)
☐Advance payment ☐Share the cost for mould production (____ % of the total cost)
☐Share the cost of investment in machinery/equipment (____ % of the total cost)
☐Technological assistance (e.g., quality control or production process)
☐Training ☐Consultancy ☐Others ____________________

The following (I to N) are questions specifically about your relationship with the suppliers of the general components that are most important to ensure the quality of your products.
Name of component:________________________

I. What is the share of the largest supplier in the total value of procurement for this component? _________ % The share of the three largest suppliers? ________ %

J. How long have you had transactions with the largest supplier? ______years/ months
With the second largest supplier?______years/ months

K. On average, how frequently do you place orders to the largest supplier?
___________ time(s) a day / week / month (Please circle the appropriate unit.)

L. On average, how frequently do you receive deliveries from the largest supplier?
___________ time(s) a day / week / month (Please circle the appropriate unit.)

M. How often do the staffs of your company visit the largest supplier?________________

N. How often do the staffs of the largest supplier visit your company?_______________

4. Source of Technology and Knowledge

If you have ever collaborated with, or received assistance from any foreign partners on designing or production of motorcycles or parts, please answer the following questions.

4.1. How many partners have you had? ________

4.2 What are the nationalities of the partners? (Please tick as many as applicable.)
☐Chinese ☐Taiwanese ☐Korean ☐Japanese ☐Others
Nationality of the main partner (in case of multiple partners) _____________________

4.3 Length of relationship with the main partner. _____________

4.4 Form of collaboration or assistance
☐Joint Venture ☐Technology Licensing Agreement
☐Purchase of Machinery or Equipment ☐Purchase of Mold ☐Others ______________

4.5 How did the main partner assist your company? Please tick as many as applicable.
☐Dispatch of engineers and/or staffs for training.
How many engineers and/or staffs were dispatched?___________
How long did they stay at your company?_______________
☐Provision of molds: For which components?______________
☐Provision of design drawings: For which components?______________
☐Provision of machinery or equipment: Type of machinery:_______________________
☐Others.____

5. Future Prospects

Please comment on the future prospects of the motorcycle business of your company.
____
____

Thank you very much for your cooperation!!