Evolution and external impact of MNE subsidiaries in emerging economies

Case study evidence from German MNEs in China and India

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Summary

The aim of this dissertation is to enhance transparency of the drivers and mechanisms underlying the evolution of subsidiaries of multinational enterprises (MNE) in emerging economies as well as of the associated impact on the host environment.

Acknowledging the dual role of MNE subsidiaries in augmenting the MNE's competitive advantage on the one hand and in inducing economic development in the host environment on the other hand, the dissertation applies a multidisciplinary approach and draws on both International Business/Strategic Management and Economic Geography literature. While both literature streams can contribute insightful concepts and empirical evidence to the analysis of MNE subsidiaries, they fall short of fully explaining their evolution and external impact. *International Business/Strategic Management* literature needs to develop a deeper understanding of the interplay of MNE subsidiaries and their host environment, in particular with regard to the role of *space* and *place* as well as the role of relations to external actors for the development of subsidiary-specific advantages. Moreover, in the light of the dynamic development of large emerging economies such as China and India, the particularities of these locations for MNE subsidiaries need to be given more research attention. *Economic Geography* can provide a complementary spatial and relational perspective to the analysis of MNE subsidiaries. However, it needs to pay more attention to the configurations and relations on the micro-level of the subsidiary and in the global MNE network influencing the behavior of MNE subsidiaries in the national and regional host environment.

In order to enrich these two literature streams with regard to the microfoundations of MNE subsidiary evolution and external impact in emerging economies, this dissertation applies an in-depth, qualitative approach drawing on case studies of six subsidiaries of German MNEs in China and India. In the first empirical part, it presents evidence for the evolution of the researched subsidiaries and analyzes the underlying drivers and mechanisms in the MNE-internal and -external environment. The analysis generates empirical insights in particular with regard to the role of MNE strategy and organization, the dual-embeddedness of subsidiaries in MNE-internal and -external relations, as well as *space* and *place* for the evolution of MNE subsidiaries. In the second empirical part, the dissertation investigates the external impact of MNE subsidiaries on actors in the host environment and reveals the conditions on the level of the subsidiary, the MNE, and actors in the host environment mediating this impact.

Keywords: Emerging Economies, Multinational Enterprises, Subsidiary Evolution

Zusammenfassung

Ziel dieser Dissertation ist es, Transparenz über die treibenden Kräfte und Mechanismen zu generieren, die die Entwicklung von Tochtergesellschaften multinationaler Unternehmen (MNU) in Schwellenländern und deren Auswirkung auf die Gastumgebung beeinflussen.

Um der komplexen Rolle der MNU Tochtergesellschaft als Förderer des Wettbewerbsvorteils des MNU einerseits und Förderer der wirtschaftlichen Entwicklung der Gastumgebung andererseits gerecht zu werden, verfolgt die Dissertation einen multidisziplinären Ansatz und greift auf Literatur der Managementforschung sowie der Wirtschaftsgeographie zurück. Beide Forschungsfelder können einen wertvollen Beitrag zur Analyse von MNU Tochtergesellschaften leisten, vermögen es jedoch nicht, deren Entwicklungspfade und externe Auswirkungen vollständig zu erklären. Die *Managementforschung* muss ein tiefergehendes Verständnis für das Zusammenspiel von Tochtergesellschaft und Gastumgebung entwickeln, insbesondere im Hinblick auf räumliche und relationale Aspekte in der Generierung von spezifischen strategischen Vorteilen der Tochtergesellschaft. Angesichts der dynamischen Entwicklung großer Schwellenländer wie China und Indien muss den Besonderheiten dieser Standorte für MNUs zudem mehr Forschungsinteresse zuteilwerden. Die *wirtschaftsgeographische* Literatur bietet eine komplementäre räumliche und relationale Perspektive auf MNU Tochtergesellschaften. Sie muss jedoch mehr Aufmerksamkeit auf die Konfigurationen und Beziehungen auf der Mikroebene der Tochtergesellschaft sowie im globalen MNU Netzwerk richten, die das Verhalten von Tochtergesellschaften in der nationalen und regionalen Gastumgebung beeinflussen.

Um diese beiden Forschungsfelder im Hinblick auf die Entwicklungspfade und externen Auswirkungen von MNU Tochtergesellschaften in Schwellenländern zu ergänzen, wendet diese Dissertation ein qualitatives Forschungsdesign an und entwickelt Fallstudien über sechs Tochtergesellschaften deutscher MNUs in China und Indien. Im ersten empirischen Teil werden Beobachtungen zur Evolution der untersuchten Tochtergesellschaften präsentiert und treibende Kräfte hinter dieser Entwicklung untersucht. Die Analyse generiert empirische Erkenntnisse insbesondere im Hinblick auf die Rolle von MNU Strategie und Organisation, die Einbettung von Tochtergesellschaften in MNU-interne und externe Beziehungen und die Rolle von "space" und "place" (Raum und Ort) für die Evolution von MNU Tochtergesellschaften. Im zweiten empirischen Teil werden die externen Auswirkungen von MNU Tochtergesellschaften auf Akteure der Gastumgebung (insbesondere Lieferanten) diskutiert und Faktoren, die diese Wirkung beeinflussen, untersucht.

Schlagworte: Schwellenländer, Multinationale Unternehmen, Subsidiary Evolution

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Abbreviations

BRIC	Brazil, Russia, India, and Chinas
BU	Business Unit
CDM	Clean Development Mechanism
CEO	Chief Executive Officer
eMobility	Electric Mobility
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
HQ	Headquarters
HR	Human Resources
IB	International Business
ICT	Information and Communication Technologies
IP	Intellectual Property
ITI	Industrial Training Institutes (India)
JV	Joint Venture
LED	Light-Emitting Diode
MNC	Multinational Corporation (interchangeable with MNE)
MNE	Multinational Enterprise
NCR	National Capital Region (India)
NEG	New Economic Geography
OEM	Original Equipment Manufacturer
OLI	Ownership-Location-Internalization
PRD	Pearl River Delta
R&D	Research and Development
SIP	Suzhou Industrial Park (China)
SMT	Surface-Mount Technology
SSL	Solid-State Lighting
Trans.	Translated (interview quotes)
US$	United States Dollar
WTO	World Trade Organization
YRD	Yangtze River Delta

Part A: Introduction

1 Introduction

1.1 Problem statement and research questions

The relevance of Multinational Enterprises (MNE) and their subsidiaries has increased continuously in recent decades with the globalization of markets and firms. In 2010, MNEs accounted for more than a quarter of global GDP and a third of global exports (UNCTAD 2011a). And MNEs are getting even more global: their average share of revenue generated beyond the home market rose from 35 percent in 2005 to around 40 percent by 2010 (UNCTAD 2011a). This recent development was closely related to the dynamic rise of large emerging economies (e.g. China and India), which has motivated MNEs to further internationalize their activities in order to capture markets, efficiencies as well as localized resources and knowledge sources in these locations (MEYER et al. 2011). This trend was reinforced recently by the global financial and economic crisis and the relatively fast recovery of the emerging economies. Consequently, some of the world's largest MNEs today generate a third or more of their operating income in emerging economies (UNCTAD 2011a).

With this growth in MNE activity, the relevance of MNE subsidiaries for the world economy has increased. In 2010, MNE subsidiaries have accounted for about one-third of global exports and one-tenth of global GDP (UNCTAD 2011a). While most of this value is still generated by subsidiaries in the developed world, recent years have seen a decisive shift to the emerging economies and – above all – to the so-called BRIC-countries.[1] In fact, *greenfield* foreign direct investment (FDI) of the world's 100 largest MNEs in emerging economies have increased by 23 percent from 2008 to 2010, compared to a mere four percent increase in the developed economies (UNCTAD 2011a).

The acceleration of MNE activity in emerging economies has consequences for both the MNE-internal network and the external (host) environment. For MNE management, the geographic shift of business activity towards the emerging economies creates opportunities for revenue growth and global efficiencies as well as access to new knowledge and capabilities to augment the MNE's competitive advantage. At the same time, however, MNE management faces a range of strategic and organizational challenges related to the increasing differentiation in their internal and external network (MEYER et al. 2011). For national and

[1] Brazil, Russia, India, and China.

regional policy in emerging economies, the acceleration of MNE activity generates opportunities for an MNE-led upgrading of domestic firms and innovation systems by offering access to extra-territorial knowledge and technology as well as global value chains. At the same time, policy makers must manage the risk of adverse effects associated with MNE activity in emerging economies (REVILLA DIEZ and BERGER 2005, GIROUD 2007, BEUGELSDIJK et al. 2008).

The ability and willingness of MNE subsidiaries to contribute to their MNE-internal and -external environment is not constant, but evolves over time. While some subsidiaries create unique capabilities and evolve into centers of excellence in the MNE and nuclei for upgrading and economic development in the host environment, other subsidiaries stagnate or cease to exist. It is therefore of strong interest for research, policy makers as well as MNE management to gain an in-depth understanding of how MNE subsidiaries in dynamic emerging economies evolve over time and interact with their host environment.

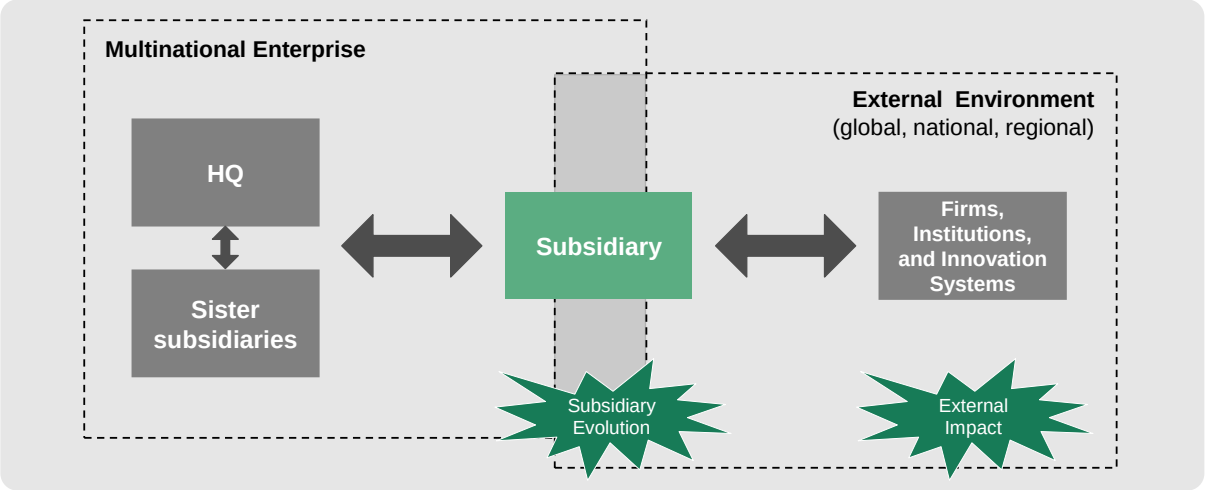

Figure 1: The dual embeddedness of MNE subsidiaries

Source: Figure provided by author.

The evolution and external impact of MNE subsidiaries is related to processes and relations in the interface of the MNE-internal and -external environment. Consequently, this dissertation applies a multi-disciplinary conceptual approach drawing on insights from International Business (IB)/Strategic Management as well as Economic Geography.

Since the 1990s, IB/Strategy literature has increasingly focused on the role of subsidiaries in augmenting the MNE's competitive advantage and has argued that the source of a subsidiary's strategic assets might rest in the differentiated nature of its host environment (BARTLETT and GHOSHAL 1989, GHOSHAL and NOHRIA 1997). However, this literature has left open

many questions as far as processes on the subsidiary level are concerned – especially with regard to the interface of the subsidiary and the host environment (MCCANN and MUDAMBI 2005, ANDERSSON et al. 2007, ASMUSSEN et al. 2009).

Economic Geography, the second pillar of this dissertation, can provide a complementary perspective on the MNE subsidiary as an actor in a particular national and regional host environment. It is concerned with agglomeration economies, national and regional innovation systems, and mechanisms of localized knowledge generation and distribution (MARSHALL 1920, KRUGMAN 1991, COOKE 2001, REVILLA DIEZ 2002, MALMBERG and MASKELL 2006). However, this literature has left open many questions as far as location strategies, activities, and linkages on the micro-level of the MNE and the subsidiary are concerned (MCCANN and MUDAMBI 2005, BEUGELSDIJK et al. 2010).

These observations suggest that both literature streams could benefit from in-depth research on the temporal, relational, and spatial dynamics of the interplay of MNE subsidiaries and the MNE-internal and -external environment – in particular in dynamic emerging economies. This dissertation will therefore address the following questions:

How and why do MNE subsidiaries in emerging economies evolve over time?

- How can 'subsidiary evolution' be conceptualized and measured?
- Which theoretical explanations and empirical evidence for subsidiary evolution can the International Business/Strategic Management literature on the MNE provide? What can other literature streams contribute to explain subsidiary evolution, in particular with regard to the embeddedness of MNE subsidiaries in space and place?
- How do subsidiaries of developed-country-MNEs evolve over time in dynamic emerging economies such as China and India?
- What are the drivers of subsidiary evolution in emerging economy environments such as China and India? Which mechanisms on the subsidiary-level and in interaction with the MNE-internal and -external environment facilitate this evolution, in particular with regard to configurations and relations on the regional level?
- How can qualitative research assess the 'relative importance' of explanatory constructs identified in case studies? What can be inferred from MNE subsidiaries in emerging economies such as China and India about the 'relative importance' of particular configurations and relations in the subsidiary-endogenous, internal, and external environment for the evolution of MNE subsidiaries over time?

How and why do MNE subsidiaries impact their host environment?

- Which literature streams offer theoretical explanations for the impact of MNE subsidiaries on their host environment? What empirical evidence is available?
- How does the presence (and evolution) of MNE subsidiaries in emerging economies such as China and India impact individual actors in their host environment?

- Which conditions on the level of the subsidiary and the MNE as well as of policy, innovations systems, and individual firms in the host environment mediate this impact? In particular, what is the role of relations and geographic proximity for the spillover of knowledge and technology to domestic firms?

What does the experience of MNE subsidiaries in China and India imply for policy and MNE management?

- How can national and regional policy makers induce the upgrading of MNE subsidiaries? How can policy makers encourage the generation of spillover potential by MNE subsidiaries and its effective absorption by domestic firms?
- How can MNEs respond to underdeveloped upstream industries, labor markets, and institutional environments in emerging economies such as China and India? How can MNEs access and utilize localized advantages in such environments?

1.2 Dissertation outline

The remainder of this introductory chapter (*chapter one*) presents theoretical perspectives on the researched phenomenon, provides a detailed account of the research design, and introduces the case study companies and host environments. *Part B* of this dissertation takes the perspective of the MNE subsidiary and investigates the trajectories and drivers of its evolution over time. *Chapter two* presents evidence for subsidiary evolution in the case studies. Building on these findings, *chapter three* analyzes the drivers and mechanisms in the MNE-internal environment on the level of the subsidiary, in vertical relations with the HQ, and in horizontal relations with sister subsidiaries. *Chapter four* complements this analysis with a discussion of drivers and mechanisms in the external (host) environment. And *chapter five* concludes the discussion on subsidiary evolution with an assessment of causal evolution trajectories in the case studies. *Part C* (*Chapter six*) takes the perspective of the host environment and presents evidence for external impact from MNE subsidiaries on domestic firms and institutions as well as the mediating conditions for such spillovers. *Part D* (*chapter seven*) concludes this dissertation with a summary of key findings, a discussion of limitations and areas for further research, and implications for MNE management and policy makers.

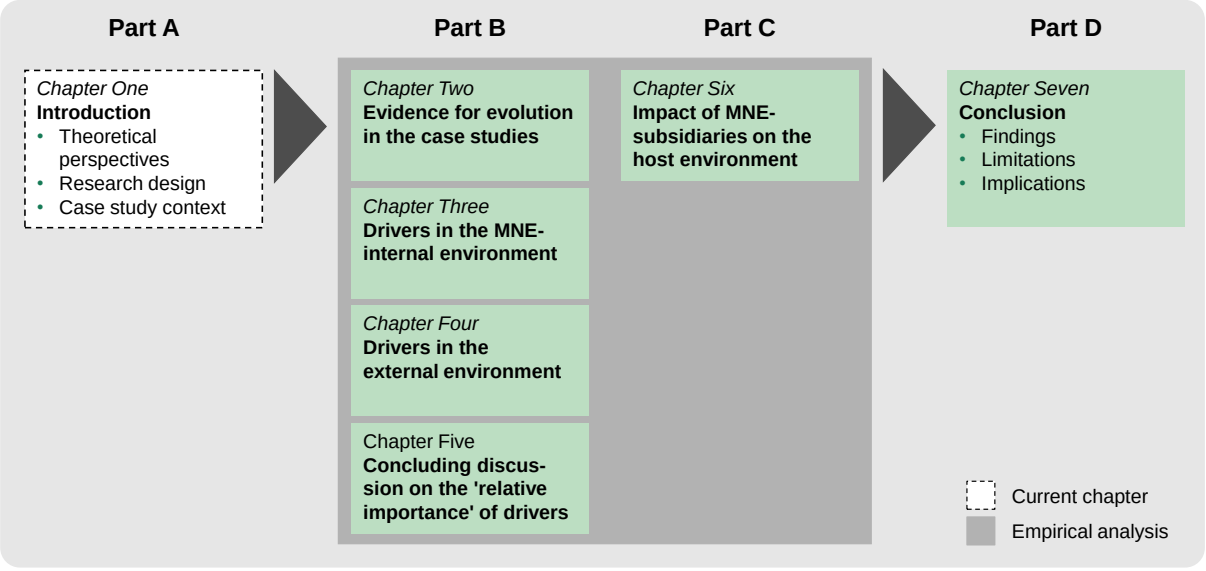

Figure 2: Dissertation outline

Source: Figure provided by author.

1.3 Theoretical perspectives

The dual embeddedness of MNE subsidiaries in the MNE-internal and -external environment calls for a multi-disciplinary approach. Drawing on insights from International Business (IB)/Strategic Management and Economic Geography, the following section will present theoretical perspectives on the MNE, the subsidiary as well as their interplay with the national and regional host environment.

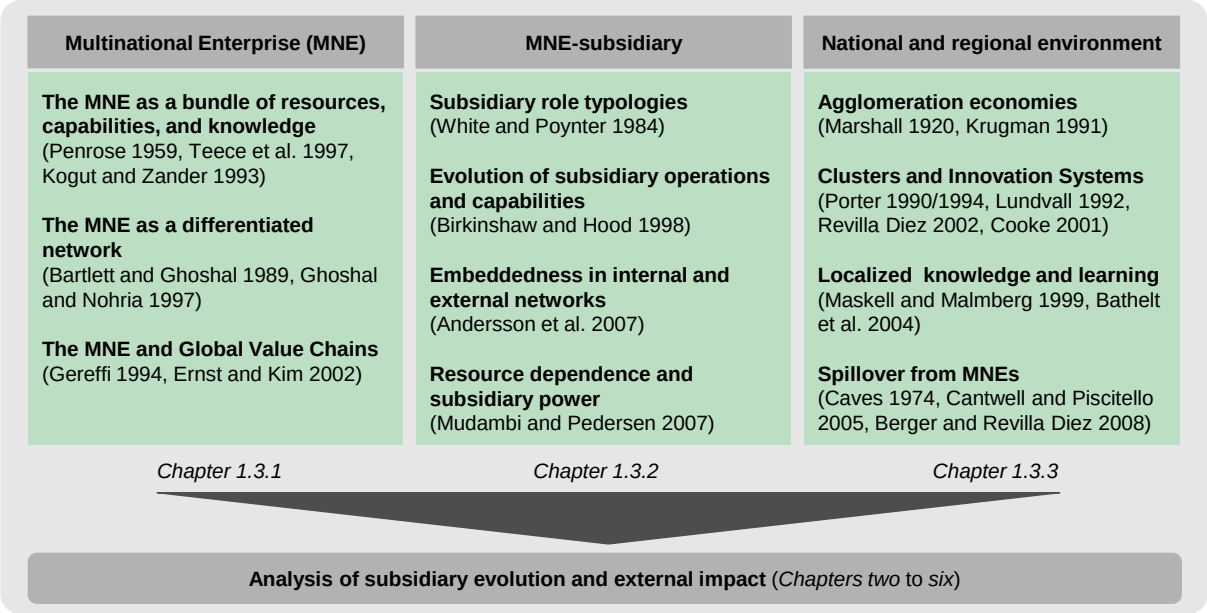

Figure 3: Guiding theoretical perspectives

Source: Figure provided by author.

1.3.1 The Multinational Enterprise

The internationalization of the business firm is at the center of a variety of theoretical approaches in International Business (IB)/Strategic Management. Early approaches to the MNE (*internationalization theories*) were concerned with the determinants of firm internationalization (VERNON 1966, STOPFORD and WELLS 1972). A particularly influential concept was the product-life-cycle approach of VERNON (1966). These early approaches were complemented by works on transaction cost economics and the internalization of market failure in cross-border transactions, which were to become the dominating paradigm in IB research (COASE 1937, WILLIAMSON 1971, BUCKLEY and CASSON 1976). Building on insights of transaction cost and internalization as well as on other emerging theoretical concepts on monopolistic advantage and market imperfections

(e.g. on the work of HYMER (1976), DUNNING (1977, 1981, 2001) developed an integrative framework – the eclectic paradigm or OLI – to explain multinational business activity and organizational forms. The OLI framework suggests that the MNE is driven by *ownership advantages* (firm-specific advantages related to the resources and size of the firm), *location advantages* (related to the factor endowment of the host environment), and *internalization advantages* (internalizing market failure by forming internal markets).

Besides the dominant paradigm of transaction cost economics, a competence perspective on the MNE has proliferated in IB/Strategy. At the core of this perspective is the resource-based theory of the firm which views the firm as a bundle of resources which constitute the foundation of its competitive advantage (PENROSE 1959, WERNERFELT 1984). The dynamic capabilities view goes beyond resource endowment and highlights the firm's ability "*[…] to integrate, build, and reconfigure internal and external competences to address rapidly changing environments*" as the source of its competitive advantage (TEEECE et al. 1997: 516). The knowledge-based view of the firm provides a complementary perspective on firm advantage with a focus on learning and knowledge (KOGUT and ZANDER 1993). In particular the latter two perspectives view the competitive advantage of firms as not being limited to endogenous factors, but as a result of combining firm-internal and -external knowledge and capabilities.

Throughout the literature on the MNE, the issue of knowledge accumulation and learning has received considerable attention in recent decades (DANTAS et al. 2007). The conceptualization of firm learning evolved from a mere focus on technology acquisition to an understanding of learning as a cumulative process of acquiring knowledge and capabilities and recombining them with existing knowledge and capabilities in order to build more innovative levels of technological capabilities over time (KOGUT and ZANDER 1993, DANTAS et al. 2007). Furthermore, it was increasingly acknowledged that learning does not happen automatically from experience, but "*[…] can only be achieved through purposeful efforts and explicit investments by the firm, e.g. through learning by hiring, training, and searching*" (DANTAS et al. 2007: 20).

With the focus on competences and firm learning as sources of competitive advantage in the literature and observations of increasingly globalizing firms and emerging flexible organizational forms, the conceptualization of the MNE has evolved towards networks models. A particularly influential approach is the concept of the MNE as inter-organizational network of differentiated yet coordinated units that both compete and collaborate with each other (BARTLETT and GHOSHAL 1989, GHOSHAL and NOHRIA 1997). Understanding

the MNE as a *differentiated network* marks a shift from home-base- and ethnocentric towards a polycentric organizational model of the MNE. It suggests that the competitive advantage of an MNE might rest in its ability to access (often location-bound) resources and capabilities of geographically dispersed subsidiaries and its ability re-combine them with the MNE's existing knowledge base (GHOSHAL and NOHRIA 1997).

The conceptualization of the MNE as a differentiated and interactive network reflects a shift in FDI motives in recent decades: *traditional* resource- and market-seeking motives are increasingly complemented – but not replaced – by efficiency- and strategic-asset-seeking FDI. MNE strategy might therefore shift from exploiting ownership advantages to augmenting these advantages through a global network of subsidiaries (DUNNING 2001). In the context of knowledge-intensive R&D activities, KUEMMERLE (1999) observes a trend in MNE strategy from home-base exploiting towards home-base augmenting strategies aiming at fostering the MNEs knowledge base (KUEMMERLE 1999).

More recent literature on *Business Networks* develops the network concept of the MNE further and encourages researchers to take the analysis beyond narrow hierarchical boundaries and to focus more attention to a firm's linkages to external partners (FORSGREN et al. 2005, ANDERSSON et al. 2007). This literature suggests that MNEs do not merely react in a passive way to the external environment, but might in fact be embedded in a network of external linkages for learning and knowledge exchange. Understanding external relations as part of the overall MNE network blurs the boundaries between the *internal* and *external* environment which dominate the conceptualization of the MNE in most of IB/Strategy.

Literature on *Global Value Chains* and *Production Networks* also focuses the analysis of the MNE beyond hierarchical boundaries. It focuses on vertically and geographically disintegrated chains of value-add steps which might span across multiple organizations (GEREFFI 1994, ERNST and KIM 2002, IVARSSON and ALVSTAM 2010). According to ERNST and KIM (2002), "*most studies [on differentiated networks] have focused too narrowly on the perspective of the network flagship […]. We need research that explores as well implications for network suppliers, especially lower-tier suppliers from developing countries*" (ERNST and KIM 2002: 1418). Building on earlier works on regional economic development in relation to extra-regional processes (DICKEN 1976) as well as on the concept of the firm as a value chain (PORTER 1985), this literature focuses on linkages of global lead firms to domestic firms, and the learning and upgrading opportunities for firms and regions associated therewith. On the micro level of the domestic firm, it analyzes how linkages to global value chains might offer access to global markets and learning. Successful firms might

follow an upgrading trajectory towards becoming an *original equipment, design, or brand manufacturer* in their own right (YEUNG 2007, GEREFFI and FREDERICK 2010). With regard to the macro-level of developing countries, the literature analyzes opportunities for export-led economic development, and how industries might achieve strategic positions in global value chains (GEREFFI et al. 2005, YEUNG 2006).

Literature in the Strategic Management tradition has long been concerned with organizational and strategic responses of firms to challenges in a globalizing business world. An influential strategic framework is the *Integration-Responsiveness (I-R)* framework (PRAHALAD and DOZ 1987, BARTLETT and GHOSHAL 1989). It builds on the assumption that the pressure to achieve MNE-wide efficiency in R&D, manufacturing, and sourcing requires *global integration* of operations, while differentiated customers, distribution channels, resource bases, and host governments might require *responsiveness* to the host environment (PRAHALAD and DOZ 1987).[2] Based on these considerations, the I-R framework generates a typology of generic MNE strategies (BARTLETT and GHOSHAL 1989).[3] The *transnational* strategy, which combines global integration and local responsiveness, is generally associated with highest economic returns for the MNE, but also with the greatest challenges for MNE and subsidiary management (LUO 2003). While the I-R framework is still frequently applied by practitioners as a useful tool to categorize and guide MNE strategy, scholars have raised concerns in recent years regarding its simple dichotomy (MEYER et al. 2011, RUGMAN et al. 2011). As many MNEs are today increasingly complex aggregations of a large number of subsidiaries (even multiple ones per host country), MNEs must manage the *multiple embeddedness* of their organization in a number of differentiated contexts. However, the existing literature on the MNE does not yet provide a comprehensive theoretical framework of the MNE incorporating these complexities (MEYER et al. 2011).

1.3.2 The MNE subsidiary

According to the early internationalization concepts (see e.g. VERNON 1966) and the OLI framework of DUNNING (1977), ownership-specific advantages are mainly developed in the MNE HQ and are exploited by subsidiaries in the respective host countries (BIRKINSHAW and HOOD 1998). In the light of increasingly global, dynamic, and complex environments in recent decades, however, it became apparent that these advantages might also be created by

[2] Since its initial publication, the I-R framework has undergone numerous modifications. What remains unclear from these frameworks, however, is to what extend the pressure to integrate or be responsive is to be ascribed to the external industry environment and to what extend it is actually owed to management choice (DEVINNEY 2000).

[3] International (low I, low R), multi-domestic (low I, high R), global (high I, low R), and transnational (high I, high I).

the subsidiaries themselves (BIRKINSHAW and HOOD 1998, DUNNING 2001). The very advantage of the MNE might therefore be its ability to access and combine unique capabilities of its geographically dispersed subsidiaries. Consequently, recent conceptualizations of the MNE view it increasingly as a network of "*[…] loosely coupled entities, rather than a hierarchical monolith*" (BIRKINSHAW and HOOD 1998: 778), in which each entity (potentially) contributes to the MNE's knowledge and capability pool. This growing awareness of the uniqueness of subsidiaries and their critical role for the MNEs competitiveness has encouraged researchers to shift attention from the MNE to the level of the subsidiary and to understanding the roles played by subsidiaries and the reasons for variations between them (BIRKINSHAW and HOOD 1998, RUGMAN 2011).

A variety of subsidiary typologies emerged to reflect these differentiated roles and responsibilities of MNE subsidiaries. The *classic* typology of WHITE and POYNTER (1984) focuses on the product scope, geographic scope, and value-add scope of subsidiary operations. Based on these criteria, five subsidiary roles are distinguished: *Marketing Satellite*, *Miniature Replica*, *Rationalized Manufacturer*, *Product Specialist*, and *Strategic Independent Unit*. This typology has been applied successfully in several empirical studies (see e.g. DELANY 1998, DOERRENBAECHER and GAMMELGAARD 2006). Other typologies were developed by D'CRUZ (1986), BARTLETT and GHOSHAL (1989), JARILLO and MARTINEZ (1990), TAGGART (1997), MARIN and GIULIANI (2007), and FUCHS and WINTER (2009), each focusing on different aspects of a subsidiary's capabilities, operations, or MNE-internal role.

These typologies describe the different roles subsidiaries may take on, but they do not answer the question *how* and *why* subsidiaries change their roles over time (BIRKINSHAW and HOOD 1998). A new stream of literature in Strategic Management has emerged in the 1990s to fill this gap with a dynamic view on the evolution of subsidiary roles. In this literature, the term *evolution* is preferred to the terms *upgrading* or *development* in order to also capture events of subsidiary decline or downgrading, a phenomenon not uncommon in the competitive MNE-internal and -external market place (BIRKINSHAW and HOOD 1998). The term evolution is used in rather broad terms as a synonym for change, irrespective of whether this change has been driven by an evolutionary development (e.g. in terms of changing routines as in NELSON and WINTER 1982) or by an external shock. While most studies on subsidiary evolution do not explicitly integrate concepts and terminology of

evolutionary theories, concepts such as path dependence nevertheless play an important role in some studies (see e.g. BARKEMA and DROGENDIJK 2007).[4]

Research under the umbrella of subsidiary evolution frames the phenomenon in different ways: while some studies focus more on the capability side and investigate the development of *innovative competencies* (FUCHS and WINTER 2009) or *innovative capabilities* (KOKKO and KRAVTSOVA 2008) by subsidiaries, other studies focus on actual operations on the ground and investigate changes in the number of functional activities covered or in the variety of products produced, geographic markets served, and value-add performed (BENITO et al. 2003, DAVIS and MEYER 2004, BIRKINSHAW et al. 2005, DOERRENBAECHER and GAMMELGAARD 2006, EGERAAT and BREATHNACH 2008). In their seminal 1998 paper, BIRKINSHAW and HOOD (1998) combine the focus on capabilities and operations, and understand subsidiary evolution as a change of a subsidiary's operations (i.e. the *charter* or mandate of a subsidiary) and the enhancement or depletion of its capabilities. The idea is that these two changes do not necessarily run in parallel, giving way for different evolution trajectories along which either capabilities follow operations or vice versa.

In the traditional IB/Strategy paradigm, changes to subsidiary roles were viewed as being primarily driven by assignment of the MNE HQ (see e.g. VERNON 1966). More recent literature applies a subsidiary-level view and broadens the scope of the analysis in order to incorporate (potential) subsidiary-endogenous and external drivers of subsidiary evolution (BIRKINSHAW and HOOD 1998, FROST et al. 2002). This reflects the observation that MNE subsidiaries face *isomorphic pressures* from both within the MNE and the external environment, and that they might in fact be actors in their own right, influencing their destiny through their actions (MARIN and GIULIANI 2007). The conceptual frameworks of subsidiary evolution in this literature vary with respect to how subsidiary evolution is conceptualized and which factors in which environment are regarded as potential drivers.

In their seminal 1998 paper, BIRKINSHAW and HOOD (1998) identify evolution drivers in three environments: the MNE headquarters (HQ), the subsidiary, and the external environment. They understand evolution as a function of *HQ push* to up- or downgrade the subsidiary's operations, the subsidiary's choice to upgrade its capabilities and *pull* new mandates from the HQ, and *environmental determinism* influencing the activities of the MNE. The relevance of these drivers in any given case depends on a range of contextual factors in the internal (e.g. decentralization of decision-making) and external environment (e.g. strategic

[4] An exception is YAMIN (1999), where the evolution of subsidiary capabilities is explicitly linked to path dependent mechanisms in a subsidiary's history.

importance of the host market), as well as on subsidiary-endogenous factors (e.g. initiative of subsidiary management). TAVARES (2001) extends this conceptual framework with a multi-level perspective on the MNE-internal and -external environment. The analysis of the MNE-internal environment is no longer restricted to the HQ-subsidiary dyad (vertical linkages), but also includes linkages to sister subsidiaries (horizontal linkages). Furthermore, different geographic levels of the external environment are disentangled and potential interrelations between the three environments highlighted (TAVARES 2001).

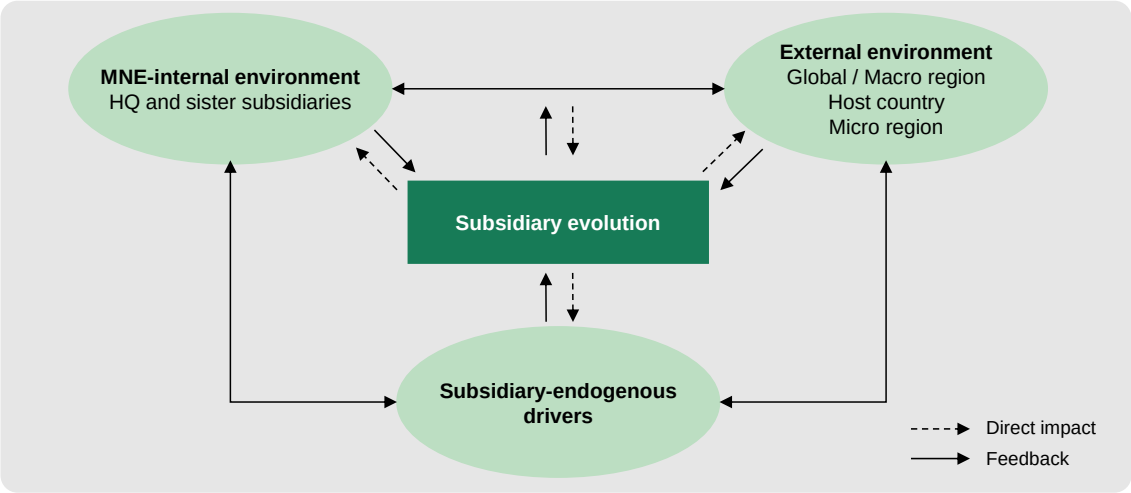

Figure 4: Framework of subsidiary evolution by TAVARES (2001)

Source: Figure provided by author. Modification of TAVARES (2001:143).

The innovative element in the approaches of BIRKINSHAW and HOOD (1998) and TAVARES (2001) is the acknowledgement of a subsidiary-driven evolution path. Underlying such an evolution path are concepts of dynamic capabilities and cumulative learning of the firm, which might take place not only in the HQ, but also in subsidiaries – even in peripheral locations. The evolution of subsidiary roles could therefore be the result of a path dependent process of generating and accumulating capabilities on the subsidiary level (BIRKINSHAW and HOOD 1998). The idea of subsidiary-specific advantages is closely related to the concept of dynamics capabilities, which is concerned with a firm's ability to combine specific internal and external competences to respond to changing environments (TEEECE et al. 1997). With its *incomplete template* of HQ resources and routines and its location in a unique geographical setting, a subsidiary might over time develop capabilities which are unique to the MNE. This unique capability profile is *sticky* in the sense that its tacit and contextual character makes it difficult to transfer. Developing such a unique capability profile can help the subsidiary to attract new resources and mandates from its HQ and thereby to expand its operational scope

(BIRKINSHAW and HOOD 1998). Owed to the path dependent nature of such a capability-driven evolution, the legacy of a subsidiary in the host environment related to its mode of entry might play an important role for its evolution over time (YAMIN 1999).

While BIRKINSHAW and HOOD (1998) and TAVARES (2001) view the external environment mainly as context configurations to which the MNE and its subsidiaries react in a rather passive way (*environmental determinism*), more recent contributions focus explicitly on the role of a subsidiary's linkages to the host environment for the evolution of its capabilities and operations (e.g. DROGENDIJK 2005, ANDERSSON et al. 2007, PHENE and ALMEIDA 2008). In this literature, the absorption of knowledge from external partners is found to support the generation of unique capabilities by a subsidiary, which might enable the subsidiary to proactively upgrade its operations and to bargain in with the MNE for resources and mandates (ANDERSSON et al. 2007, PHENE and ALMEIDA 2008).

The literature on subsidiary evolution pays particular attention to HQ-subsidiary knowledge flows, power, and bargaining processes which precede and/or accompany subsidiary evolution (BIRKINSHAW and HOOD 1998, MUDAMBI and PEDERSEN 2007, GARCIA-PONT et al. 2009). *Resource dependence theory* provides a helpful perspective in this regard (PFEFFER and SALANCIK 1977). From this perspective, the control of strategic resources and capabilities by a subsidiary constitutes a form of power in the MNE. Strategic assets increase the dependence of other MNE units on the subsidiary and therefore strengthen its bargaining power in MNE-internal negotiations for resources and mandates (MUDAMBI and PEDERSEN 2007). In other words, a subsidiary with strategic assets might own its decision rights. The MNE HQs must therefore apply *soft* control mechanisms (versus *hard*, hierarchical ones) to encourage the accumulation of strategic asset by the subsidiary while at the same time ensuring sufficient levels of integration of the subsidiary into the MNE (MUDAMBI and PEDERSEN 2007). Strong dependence on a particular subsidiary is likely to translate into close HQ attention and monitoring, which might reduce the subsidiary's freedom to pursue initiatives to drive its own evolution. In contrast, if the dependence of the MNE on the subsidiary is low (e.g. in the case of peripheral subsidiaries with unattractive markets and capabilities), the subsidiary might enjoy higher levels of freedom to engage in (semi-) autonomous upgrading activities and to drive its evolution.

1.3.3 The national and regional host environment

The interaction of the MNE subsidiary with its host environment can be analyzed from different angles. International Business (IB)/Strategic Management looks at challenges and opportunities in the MNE's external environment as determinants of MNE strategy, organization, and competitive advantage. Economic Geography, in contrast, takes a spatial view at economic, social, and institutional characteristics of a particular environment, with the MNE subsidiary as one of many actors embedded in this environment.

In early models of firm internationalization in IB/Strategy literature, the location of an MNE's international operations was central to the discussion. This is illustrates by the product lifecycle concept of VERNON (1966) and the *Ownership-Location-Internalization* paradigm of DUNNING (1977), which integrate location advantages of the host country in the theory of the MNE. In the following decades, however, the interest in location and geography in IB/Strategy declined, and scholars focused predominantly on MNE-internal challenges of organizing cross-border operations (CANTWELL 2009).

The 1990s saw a revival of interest in location and geography in IB/Strategy. This was owed to the observation that MNE activity has become increasingly knowledge-driven and globally interconnected in the sense that the MNE's ownership advantages rely on the interaction of specialized activities is particular locations (DUNNING 1998). This gave rise to *modern* conceptualizations of the MNE as *differentiated networks*, in which the location of geographically dispersed units is recognized as a source of the MNE's competitive advantage (BARTLETT and GHOSHAL 1989, GHOSHAL and NOHRIA 1997). The relation of the (differentiated) MNE and location is twofold: on the one hand the MNE can be seen as a geographically footloose network of transnational knowledge generation. On the other hand, it is increasingly recognized in the literature that the source of the MNE's differentiated knowledge might be location-bound in the sense that it relies on localized learning and knowledge exchange processes (HEIDENREICH and MATTES 2010). This reflects the paradox between the apparent *death of distance* (and the geographic disintegration of MNE's value chains) and the importance of localized cluster dynamics (CAIRNCROSS 1997, BRESCHI and MALERBA 2001, CANTWELL 2009).

Despite the revival of interest in location and geography, most IB/Strategy literature has maintained "*[…] a relatively underdeveloped view of geographic space*" (BEUGELSDIJK et al. 2010: 487) and has limited the analysis to the host country level, thereby ignoring the particularities of the sub-national level (BEUGELSDIJK et al. 2010, RUGMAN et al. 2011).

A pioneer of a more differentiated view on space and place in IB/Strategy was PORTER (1990, 1994), who inspired a rich body of literature on industrial clustering by highlighting that while the *death of distance* might apply to standardized inputs, the generation of knowledge and innovation relies critically on geographic proximity on the national and sub-national level. While PORTER (1994) focuses mainly on the role of cluster dynamics in enhancing the competitiveness and innovativeness of firms within the cluster, other scholars (see e.g. GHEMAWAT 2001) focus on the combination of such localized assets in the global MNE's knowledge portfolio and the augmenting of the MNE's competitive advantage. The latter perspective was inspired by the observation that MNEs are increasingly embedded in localized innovation infrastructures and engage in high-value-add activities also outside their home county (CANTWELL 2009). However, how exactly MNE subsidiaries interact with location-bound assets still remains an under-researched contingency in IB/Strategy. ANDERSSON et al. (2007), for example, observes that "*[…] only limited consideration has been given to obtaining a more precise determination of how the local environment can constitute a power base for the subsidiar*y" (ANDERSSON et al. 2007: 803). A series of recent contributions on *Global Business Networks* with an explicit focus on the interplay of MNE subsidiaries with their host environment attempts to address this shortcoming (see e.g. PHENE and ALMEIDA 2008).

Owed to the focus on MNE-internal processes in most of the IB/Strategy literature and the often simplistic conceptualization of the host environment, the impact of MNE subsidiaries on their host environment has received only limited attention until the 1990s. MEYER (2004) observes that "*international business research has been largely looking into the MNE, rather than 'looking out' from MNEs to the societies in which they are operating*" (MEYER 2004: 261, emphasis in the original). Literature on spillovers from MNE activity has long been dominated by economists (see e.g. CAVES 1974). But with growing awareness for competence-creating subsidiaries and the observation that such competences are often created in localized linkages to external partners, the two-way spillover between subsidiaries and the host environment has received increasing attention also in IB/Strategy (see e.g. CANTWELL and PISCITELLO 2005).

A rich body of Economic Geography literature with an explicitly *spatial* perspective on economic activity can provide a complementary perspective on the interplay of MNE subsidiaries and the host environment. Economic Geography explains the spatial distribution of economic activity with the economic, social, and institutional characteristics of the location

while putting particular emphasis on different types of proximity and connectivity (BEUGELSDIJK et al. 2010). Of particular interest for this research on the evolution of MNE subsidiaries are concepts of agglomeration advantages related to localized learning and knowledge accumulation (LUNDVALL 1992, MASKELL and MALMBERG 1999, BATHELT et al. 2004). At the core of these concepts is the interactive and spatial process of generating and diffusing location-specific capabilities, which is based on the assumption that tacit knowledge depends to a considerable degree on face-to-face interaction and might therefore be facilitated by the co-location of actors (MASKELL and MALMBERG 1999).

However, the effective absorption of localized knowledge and capabilities might not happen automatically from simply *being there* in terms of geographic proximity to firms and institutions. Other proximity dimensions including social, organizational, and institutional proximity might also be relevant to explain regional and extra-regional learning processes (BOSCHMA 2005, REVILLA DIEZ and KIESE 2009).

While geographic and other forms of proximity may facilitate inter-firm learning, it bears the risk of cognitive *lock-in* and might therefore eventually impede the innovative performance of firms in a particular region (BOSCHMA 2005). Some scholars therefore argue that linkages to extra-territorial knowledge in the form of *global pipelines* (BATHELT et al. 2004) or *strategic coupling* (YEUNG 2006) with global lead firms might play a crucial role for innovation and economic development on the regional and national level.

The relevance of localized tacit knowledge – and therefore the requirement for face-to-face interaction and geographic proximity – differs between industries. Industries characterized by *synthetic* knowledge creation (know-how/engineering-driven) rely on (face-to-face) exchange of tacit knowledge with customers and suppliers in geographic proximity, which might induce MNEs to form linkages to domestic partners (ASHEIM et al. 2007). Firms in industries characterized by *analytical* knowledge (know-why/natural-science-driven) depend less on tacit knowledge and face-to-face interaction with customers and suppliers and might be more interested in linking to universities and corporate R&D facilities on the regional, but also the national and international level (ASHEIM et al. 2007, MOODYSSON et al. 2008).

Economic Geography puts particular focus on the role of institutions for the generation and diffusion of knowledge. The concepts of *National Innovation Systems* (FREEMAN 1987, LUNDVALL 1992) and, since the 1990s, increasingly *Regional Innovation Systems* (COOKE 2001) argue that due to the interactive nature of learning and innovation, the innovative performance of firms and regions might rely on the availability of and linkages to external (business and non-business) partners as well as specific framework conditions and institutions

(BERGER and REVILLA DIEZ 2008). Innovation systems can be distinguished in knowledge exploitation (e.g. horizontal and vertical networks of firms) and knowledge generation and diffusion systems (e.g. universities and government agencies) (COOKE 2001). Initially, most literature on Innovation systems focused on developed countries, which are often endowed with strong endogenous innovative capabilities and technology sources (ERNST and KIM 2002). Innovation systems in emerging economies, however, might differ in some aspects from systems in the developed countries: the relatively recent and rapid catch-up process of these economies is likely to result in relatively weak innovation systems with underdeveloped institutions, human capital, innovative firms, and physical infrastructure (ERNST and KIM 2002, BERGER and REVILLA DIEZ 2008). Such innovation systems might depend heavily on MNEs for their sophisticated capabilities, technologies, and linkages to international suppliers and customers. In the context of MNE subsidiary evolution, it could therefore be assumed that such innovation systems have little to offer to foster the creation of subsidiary-specific capabilities. Furthermore, MNEs might hesitate to transfer sophisticated operations to such environments, thereby impeding both a rapid evolution of subsidiaries as well as knowledge and technology spillover to the host environment (BERGER and REVILLA DIEZ 2008).

This review has presented a rich body of literature on the MNE and its interplay with the external (host) environment. At the same time, it has indicated a range of shortcomings in both IB/Strategy and Economic Geography with regard to the research questions of this dissertation. The empirical parts of this dissertation (*Part B* and *C*) will provide further details on these shortcomings as well as new empirical insights to address them.

1.4 Research design and methodology

1.4.1 Research approach

The aim of this dissertation is to generate new empirical insights into *why* and *how* MNE subsidiaries in emerging economies do or do not upgrade their operations and capabilities over time and impact their host environment. This requires an understanding of the temporal order and importance of critical events driving the evolution of a subsidiary's operations. Moreover, it requires an understanding of relations and social processes between actor groups on different levels: the subsidiary, the MNE network with its sister-subsidiaries and HQ, and the external environment. These requirements favor a qualitative case study approach. Case study research is recognized in the literature as a useful method to investigate questions of

why and *how* a certain phenomenon has occurred "*[…] with a relatively full understanding of the nature and complexity of the complete phenomenon*" (MEREDITH 1998: 444). With an in-depth look on critical events and decisions, case study research can help to reveal evolution paths of the units under investigation (HALINEN and TOERNROOS 2005). It offers advantages over survey-based quantitative approaches by generating insights into complex social processes that remote modes of data collection cannot easily capture (EISENHARDT and GRAEBNER 2007). This is particularly relevant for the analysis of driving forces on different organizational and geographic levels which are at times difficult to disentangle.

Case study research has of course it limitations. While it is useful to address *why* and *how* questions, it might be "*ill-equipped to address the questions how often and how many*" (EISENHARDT and GRAEBNER 2007: 27). Along similar lines, YIN (2009) argues that case studies can be used to expand and generalize theories (analytical generalization), but might fall short to enumerate frequencies (statistical generalization). However, the aim of this dissertation is to investigate the mechanisms of subsidiary evolution *en detail* and open up pathways for further empirical studies, and not to generalize findings to the population of MNE subsidiaries. This aim favors an exploratory case study approach.

EISENHARDT and GRAEBNER (2007) observe an implicit assumption among some scholars that cases study research might be "*less precise, objective, and rigorous than large-scale hypothesis testing*" (EISENHARDT and GRAEBNER 2007: 26). In fact, case study research comes with several analytical caveats which threaten the reliability and validity of its findings. In order to ensure reliability of findings, this dissertation follows a rigorous methodological path, and a detailed account of the data collection and analysis process will be provided below. In order to enhance construct validity, the researched phenomenon is defined and operationalized. In order to enhance internal validity, qualitative data analysis methods are applied, multiple data sources triangulated, and a large number of interviews conducted. And to allow for some (tentative) external validity of findings, a multiple-case design with variations in the case context is applied (EISENHARDT and GRAEBNER 2007, YIN 2009).

1.4.2 Operationalization of measures

YIN (2009) recommends that case study research should aim at developing a "*sufficiently operational set of measures*" in order to enhance construct validity (YIN 2009: 41). Such an upfront specification of measures permits more accurate measurement and can generate firmer empirical grounding (EISENHARDT 1989). The classic subsidiary typology of WHITE and

POYNTER (1984) is well suited for the measurement of changing subsidiary operations over time (COUTO et al. 2003). It has already been applied successfully in several studies on subsidiary evolution (see e.g. DELANY 1998, TAGGART 1999, DOERRENBAECHER and GAMMELGAARD 2006, KOKKO and KRAVTSOVA 2008). The typology of WHITE and POYNTER (1984) builds on three basic measures to define a subsidiary's role:

- ***Product scope*** (variety in the portfolio of products and services of a subsidiary)
- ***Geographic scope*** (geographical spread of markets served by a subsidiary)
- ***Value-add scope*** (variety, depth, and complexity of value-add steps in a subsidiary)

Different combinations of these three measures form the basis for five subsidiary roles:

- **Marketing Satellite** (narrow scope in all measures; limited to marketing and sales)
- **Miniature Replica** (geographic focus on the host market but with a variety of functions. *Adopter* / *Adapter* / *Innovator* types differ in their product/value-add scope)
- **Rationalized Manufacturer** (broad geographic but limited product/value-add scope)
- **Product Specialist** (comprehensive, global mandate for a narrow product portfolio)
- **Strategic Independent Unit** (only formally aligned with the MNE; high degree of autonomy to choose its product/geographic scope)

For a better fit to the research context, few adjustments were made to the original typology:
A new *Development Specialist* role is introduced to account for subsidiaries with global development mandate without corresponding manufacturing mandate. This reflects findings in the literature that some MNEs are increasingly attempting to leverage their subsidiaries not only for resource- and efficiency-related location advantages, but also for the knowledge and capabilities embedded in the host environment of the subsidiaries (CANTWELL 2009). The manufacturing of new products developed by these subsidiaries, however, might take place in different locations in proximity to relevant markets.
Moreover, it is assumed that subsidiaries can take on multiple roles at any point in time. An example would be a *Miniature Replica* with a broad value-add scope in the Chinese market, an additional R&D mandate for Asia-Pacific (*Development Specialist)*, and a mandate as global *Rationalized Manufacturer* for selected product groups of the MNE.
The analysis of subsidiary evolution in this dissertation will be limited to manufacturing and R&D, while support processes (e.g. finance or logistics) are not considered in detail. For manufacturing-heavy MNEs like the ones selected for this research, the development and manufacturing of products constitute the core functions. The evolution of a subsidiary might

therefore be best measured by analyzing changes in these functions. Moreover, limiting the scope to two functions is preferable as it allows for more depth of insight.

The advantage of the WHITE and POYNTER (1984) typology in the context of this dissertation is that it offers a systematic approach to reconstruct a subsidiary's evolution along clearly defined measures and roles. However, as in prior case-study-based research on MNE subsidiaries, the aim of this operationalization is not to achieve precise measurement, but to gain a *rough benchmark* to compare cases against one another (HOBDAY and RUSH 2007).

An up- or downgrading of the product, geographic, or value-add scope of a subsidiary *per se* is neither good nor bad for the economic success or innovative performance of the MNE. Successful MNEs might have to maintain a balanced portfolio of market-, resource-, efficiency-, and strategic-asset-seeking subsidiaries. However, the optimization of the MNE's portfolio is not the aim of this dissertation. The focus of is rather on individual subsidiaries and the drivers of their evolution over time. An understanding of these mechanisms on the micro-level of the subsidiary is crucial for strategy and organizational development of MNEs as well as for the design of effective policies in the host environment.

1.4.3 Case selection, data collection, and analytical procedure

Most literature on subsidiary evolution is not very specific on its unit of analysis. BIRKINSHAW and HOOD (1998), for example, define their unit of analysis as a "*value-adding entity in a host country*" (BIRKINSHAW and HOOD 1998: 774). However, in the case of large MNEs and/or host countries, an MNE might have several of such units in a particular host country, each with a unique evolution path. This dissertation therefore defines its unit of analysis as a geographically, organizationally, and legally separate value-adding unit of an MNE in a particular host environment. This allows for the analysis of individual subsidiaries in relation to sister subsidiaries in the same country or region; a complexity of the MNE-internal environment commonly neglected in the literature on subsidiary evolution.

Literature on case study research distinguishes between two case selection approaches: *Statistical sampling* refers to the selection of cases for purely statistical reasons (to represent the distribution of variables in the entire population). *Theoretical sampling*, in contrast, refers to the selection of cases in which the researched phenomenon is transparently observable and which are likely to offer theoretical insight (EISENHARDT 1989). This can include the selection of cases which represent certain theoretical categories and extreme or polar configurations. The choice of the appropriate sampling mode is closely related to the

generalizability of case study findings. Statistical sampling allows for *statistical generalization* in the sense of transferring findings to the entire population and even beyond to other contexts (YIN 2009). Theoretical sampling, in contrast, might allow for *analytical generalization* in the sense of drawing theoretical propositions from the case study findings for more general application and (ultimately) for theory building (EISENHARDT and GRAEBNER 2007, YIN 2009). The aim of this dissertation is not to test a set of hypothesis for statistical generalization, but to explore under-researched mechanisms of subsidiary evolution and external impact on the host environment. Moreover, the requirement of for in-depth, multiple-level data poses a natural limitation to the number of cases. This dissertation therefore applies theoretical sampling of cases.

Case study research can build on one or multiple cases, and a trade-off exists between the number of cases and the opportunity for depth of observation (VOSS et al. 2002). The advantage of multiple cases is that it might "*[…] enable broader exploration of research questions and theoretical elaboration*" (EISENHARDT and GRAEBNER 2007: 27). Moreover, multiple cases allow for cross-case comparison and therefore for sensemaking through *replication logic* (HALINEN and TOERNROOS 2005). This can enhance the external validity of findings and help to mitigate observer bias (VOSS et al. 2002).

This dissertation follows this line of reasoning and applies a multiple-case design. The selection of cases was guided by the following criteria:

- *Context variation*: In order to assess the contribution of the external context to the evolution of the subsidiaries, two context parameters are varied: *host environment* (different regions in China and India) and *industry* (automotive supply and lighting). The host environment shapes both the MNE's strategy towards its subsidiaries and the capabilities and action of subsidiary itself. Emerging economies with their dynamic markets and constantly evolving institutional frameworks pose significant challenges to the strategy and organization of MNEs. This promises interesting findings for a study of subsidiary evolution. Industry-specific requirements shape the relations of a subsidiary to its MNE as well as to external market actors (e.g. coordination and integration along the supply chain). A variation of these parameters can help to isolate environment and industry specifics and enhance the external validity of findings.
- *Same MNE*: In order to avoid confusion between effects related to the host environment and effects related to MNE culture and strategy, pairs of subsidiaries in China and India from the same MNE were selected. This setup also allows for an analysis of cross-border horizontal relations between subsidiaries in the two countries.

- *Multiple-subsidiary presence*: In order to investigate MNE-internal horizontal relations also on a host country level, MNEs with multiple subsidiaries per host country were selected.
- *Comparability*: In order to ensure comparability of the cases, additional variation was constrained. Country-of-origin effects were constrained by selecting subsidiaries of German MNEs. Comparability of MNE and subsidiary size was ensured. Ownership effects were controlled by selecting wholly-owned subsidiaries (with one exception, which is still only 70 percent owned). In terms of entry-mode, a mix of *greenfield* and *brownfield* investments was a practical concession to fulfill the other ambitious selection criteria. While this does in fact reduce the comparability of the cases, it turned out to enrich the insights of this dissertation, as several interesting effects related to the entry mode could be isolated in the analysis.

These selection criteria constrained the population of MNEs for case selection. This could very well be a reason why such a case study sample can rarely be found in the literature.

The selection criteria presented above require a minimum of four subsidiaries (two countries, two industries). However, during the field phase it became apparent that selecting subsidiaries not only from the same MNE, but also from the same business unit (BU) within the MNE would significantly improve comparability. Since the two initially selected subsidiaries of the automotive MNE (A-PARENT) belong to different BUs, two additional subsidiaries of this MNE were included in the study. The sample therefore consists of six individual subsidiaries.

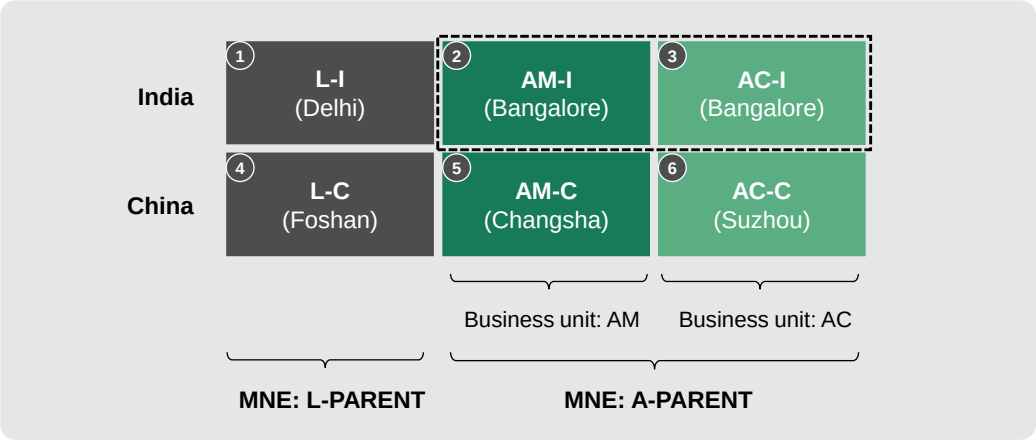

Figure 5: Overview of selected MNEs and subsidiaries[5]

Source: Figure provided by author.

[5] The two Indian subsidiaries of A-PARENT share the same site, but are organizationally and legally independent.

Case study research can be based on retrospective data or real-time observation. The advantage of retrospective data is that it allows for controlled case selection. Cases where the phenomenon is transparently observable can be selected in order to maximize theoretical insight. In practice, a retrospective approach also allows to analyze a phenomenon over a longer time period compared to real-time observation, which will eventually face resource and time constraints. This dissertation therefore applies a retrospective approach. The challenge of such an approach, however, is that "*[…] participants may not recall important events and, even if they do, their recollection might be subject to bias*" (VOSS et al. 2002: 202). A common problem is post-rationalization (or retrospective sense-making), which refers to "*[…] the interpretation of events in a different manner than [the respondent] would have at the time*" (VOSS et al. 2002: 202). An example for this is the justification of past events with information that was not available at that time (VOSS et al. 2002). These challenges are best mitigated by a thorough and comprehensive data collection process incorporating sources from "*[…] different hierarchical levels, functional areas, groups and geographies, as well as actors from other relevant organizations and outside observers*" (EISENHARDT and GRAEBNER 2007: 28). With such a procedure, it is "*[…] highly unlikely that these varied informants will engage in convergent retrospective sensemaking*" (EISENHARDT and GRAEBNER 2007: 28). Following this line of reasoning, the collection of primary data for the case studies followed a multi-perspectival approach. Interview data was collected on the level of the subsidiary, the MNE HQ, and the external environment.

Data collection started on the level of the subsidiary. Given the emphasis of this dissertation on manufacturing and R&D, staff in these functions was in focus during the interview process. Additional interviews with the general management and representatives of human resources, purchasing, and sales were included to enrich the findings. In order to generate a comprehensive overview, staff on different hierarchical levels was interviewed. In all case studies, the general managers as well as manufacturing- and R&D- heads were interviewed, together with a mix of additional senior and junior managers. Furthermore, a balance of expatriate (German) and domestic managers was ensured, which proved fruitful for the analysis as the views of these two groups complemented each other in many ways. In order to verify and extend the insights gained on the subsidiary level, managers in the MNE HQs knowledgeable about the respective subsidiaries were interviewed. And in order to include an external view on the subsidiaries, selected external partners (mostly domestic suppliers) were interviewed. For the six subsidiaries and their external partners, a total of 90 interviews were

conducted. The interviews were evenly distributed across the cases.[6] During the field phase, five additional subsidiaries of the two MNEs were visited and 39 additional interviews conducted. These five subsidiaries did not provide the depth of insight of the six focal subsidiaries. But the interviews generated interesting insights and were therefore included into the analysis and referenced accordingly. Out of the 90 interviews in the six focal subsidiaries, 75 took place in face-to-face settings, while 15 interviews were conducted via telephone. The average interview duration was 45 to 90 minutes (~30 minutes with external partners). With few exceptions, the interviews were digitally recorded.[7] Interviews in China and India were conducted by the author between August and October 2010, and interviews in the two HQs were conducted by the author between November and December 2010.

Subsidiary	MNE	Location	No. of interviews	No. of individuals	Thereof local	Thereof expats	Thereof HQ	Thereof external
L-I	L-PARENT	India (Delhi/Sonepat)	20 (28)	18 (26)	14	1	0 (8)	3
AM-I	A-PARENT	India (Bangalore)	15 (17)	13 (15)	9	2	0 (2)	2
AC-I	A-PARENT	India (Bangalore)	1 (4)	1 (4)	0	1	0 (3)	0
L-C	L-PARENT	China (Foshan)	21	19	7	3	8	1
AM-C	A-PARENT	China (Changsha)	10	8	3	3	2	0
AC-C	A-PARENT	China (Suzhou)	23	23	10	7	3	3
Six case studies			**90**	**82**	**43**	**17**	**13**	**9**
Other	A-PARENT	India (Multiple)	26	26	19	5	1	1
Other	A-PARENT	China (Hangzhou)	13	11	5	4	1	1
Total			**129**	**119**	**67**	**26**	**15**	**11**

Table 1: Overview of interviews in the selected subsidiaries[8]

Source: Table provided by author.

The interviews were conducted in a semi-structured manner in order to foster a constructive atmosphere and to allow for unexpected topics to arise during the interviews. Detailed interview guidelines were designed to organize the discussion. The guidelines start with broad, open-ended questions and become more detailed as the interview proceeds (VOSS et al. 2002). The interview questions are inspired by theoretical constructs and empirical findings in the literature as well as conceptual considerations by the author. The first part of the guidelines attempts to establish transparency regarding the evolution of the subsidiary's operations by measuring changes in product, geographic, and value-add scope. The second part includes questions regarding the drivers and mechanisms underlying these changes. Separate guidelines were designed for the three interviews groups (subsidiary, HQ, and

[6] An exception is AC-I in Bangalore, were only one two-hour interview with the Managing Director could be realized.
[7] Nine interviews could not be recorded.
[8] Interviews with HQ managers covered the subsidiaries of the respective MNE in China and India. In this table, these HQ interviews are included in the figures of the Chinese subsidiaries. For the Indian subsidiaries, the figures show both the number of interviews excluding HQ managers and the number of interviews including HQ managers (in brackets).

external partners) and the different functions (general management, manufacturing, R&D, HR, and purchasing). The guidelines share a set of general questions, which are complemented by a set of function- and context-specific questions. In accordance with established case study research procedure, dynamic adjustments of the guidelines were undertaken during the field phase to integrate emerging constructs (EISENHARDT and GRAEBNER 2007).

The primary (interview) data was complemented by secondary data on the subsidiaries, the MNEs, and the respective host environments, which was collected throughout the research process. Secondary data includes external documentary information (e.g. business press) and, whenever accessible, internal data of the subsidiaries (e.g. corporate presentations). This data was archived and triangulated with the primary data. The secondary data proved helpful to make sense of developments in individual subsidiaries as well as in their external context.

The data analysis procedure included three phases: documentation, coding, and analysis. Firstly, comprehensive field notes and case protocols were conducted during and after the data collection process. The recorded interviews were transcripted and archived. In total, more than 1,300 pages of interview data was generated and used for the analysis.

Secondly, the transcripted interview data was coded using MAXQDA, a data and text analysis software. The applied coding scheme was a blend of *thematic/classic* and *open coding*. *Thematic/classic* coding was based on a system of constructs deducted from the literature. *Open coding* follows the Grounded Theory approach and relies on an ongoing, inductive generation of new codes during the coding process (CORBIN and STRAUSS 1990). The final coding system included 150 codes arranged in an eight-level hierarchy. In total more than 5,000 text fragments were indexed.

Thirdly, the data was analyzed following the established procedures of qualitative data analysis laid out by EISENHARDT (1989), MAYRING (2000), Yin (2009). A two-step procedure was applied: within-case and cross-case analysis. During within-case analysis, thematic content analysis was applied to the coded data in order to identify and organize key constructs for subsidiary evolution and external impact. For each case, a case narrative was generated based on a decomposition of the researched period into successive stages (*temporal bracketing*) (DAGNINO et al. 2008). In each case narrative, a critical path of key events and decisions driving the evolution of the subsidiary was identified. This analysis formed the basis for the search for cross-case patterns between subsidiaries in China and India as well as between subsidiaries of the two MNEs. *Replication logic*, e.g. the occurrence of similar patterns under varying conditions, strengthens the external validity of findings of this cross-

case analysis (YIN 2009). The primary and secondary data was triangulated throughout the analysis to improve the internal validity of the findings. Rivaling explanations were taken into account and stated as loose ends for further investigation (YIN 2009).

1.5 Case study companies, industries, and host environments

In the following, the selected subsidiaries and parent MNEs as well as the industry and host environment contexts are introduced briefly.

The subsidiaries

The six selected subsidiaries are roughly comparable in terms of headcount (between 1,100 and 3,600). An exception is the much smaller AC-I, which was included for analytical purposes in order to generate matching pairs from each business unit and country. All subsidiaries engage in manufacturing and development, although the degree of sophistication of these activities differs significantly between the units. Compared to the oldest subsidiaries AM-I (1989) and L-C (1995), the subsidiaries AM-C (2004) and AC-I (2009) are still relatively young, yet their dynamic development nevertheless offers interesting insights. In terms of entry mode, a mix of *greenfield* and *brownfield* ventures was a practical concession to realize the ambitious selection criteria of this dissertation. While AC-C, AC-I, AM-I were established as *greenfield* ventures, AM-C, L-C, and L-I were established as wholly-takeovers or joint ventures with domestic partners. After few initial years, however, the MNEs took over 100 percent (or close to 100 percent) of the stakes, and since many years all subsidiaries have therefore been wholly-owned by the MNEs.

Subsidiary	Location	Year founded	Headcount (2010)	Manufacturing	Development
L-I	National Capital Region (Delhi/ Sonepat)	1998	1,200	Fluorescent lighting products	Very basic application. Development of electronic ballast variances
AM-I	Karnataka (Bangalore)	1989	1,050	Mechanical and electric drives	Basic application. Some adjustment of products. Few new products
AC-I	Karnataka (Bangalore)	2009	120	Electronic control units	Very limited application
L-C	Pearl River Delta (Foshan)	1995	3,600	Fluorescent, halogen, and SSL	Complex application. Adjustment of products. Few new products
AM-C	Hunan Province (Changsha)	2004	2,500	Mechanical & electric drives	Basic application. Since recently global center for low-cost platforms
AC-C	Yangtze River Delta (Suzhou)	1999	4,000	Electronic controls and mechanical drives	Complex application and adjustment. Some low-cost product and process development

Table 2: Key data on the selected subsidiaries

Source: Table provided by author.

The Multinational Enterprises

The two MNEs (L-PARENT and A-PARENT) are among the pioneers of German industry and where founded more than a century ago in Germany. They are today among the world market leaders in their respective industry. Both firms are engineering-driven and pride themselves for their competitive advantage in manufacturing and technological innovation. While A-PARENT is significantly bigger than L-PARENT in terms of sales and employment, the business units as reference point for the researched subsidiaries in China and India are roughly comparable. While both firms maintain a strong manufacturing and R&D footprint in Germany, they generate a significant share of global revenues in Europe and globally. Asia, and in particular China, has evolved into a major manufacturing base and market for both firms over the past two decades. The emerging relevance of the Indian market for the two MNEs is also comparable. Both MNEs have entered China and India with sales representations or licenses agreements already several decades ago. The big push for FDI in manufacturing, however, came only in the mid 1990s after restrictions on foreign ownership had been relaxed and the potential of the markets had become evident.

The industries

The two industries (lighting and automotive supply) share some common characteristics. Both are characterized by mass production – scale economies as well as efficient production systems and supply chains are key success factors. Furthermore, both industries are knowledge-intensive and driven by expertise in mechanical and electrical engineering and – increasingly – in electronics.

The two industries differ significantly on the market side. Automotive suppliers serve a limited number of large customers (*demand-side oligopoly*). The automotive OEMs as customers are very sensitive to supply chain efficiencies and enforce strict quality and process requirements at the level of their *tier-one* suppliers (A-PARENT) and further down the value chain.[9] This focus on supply chain and production system efficiency is reflected in the co-location of OEMs and component suppliers commonly observed in the automotive industry (KAUFMANN and JENTZSCH 2006, STURGEON and BIESEBROECK 2010). The lighting industry, in contrast, is characterized by a supply-side oligopoly with three big manufacturers dominating the world market. The current trend towards solid-state lighting (or LED) might challenge this oligopoly, but recent studies suggest that the three firms might be

[9] The term OEM stands for Original Equipment Manufacturer. The usage of the term OEM in the automotive industry can be confusing. OEM typically refers to the global lead firms in the automotive value chain – the automakers (see e.g. STURGEON et al. 2009). The suppliers of *original equipment* to these lead firms are referred to as *tier-one* suppliers.

able to replicate their dominant market position also in the new technology (SANDERSON et al. 2008, GEREFFI and LOWE 2008, MCKINSEY 2011). Lighting firms are highly regulated by authorities, but face less rigorous quality requirements from customers (at least in the consumer lighting market) than automotive suppliers. Lighting firms face a wide range of expectations from a ramified portfolio of customers (from low-tech commodities to high-tech, customized projects), which can be very challenging to manage by a single firm. With large wholesalers as main distribution channel (in consumer lighting), lighting firms feel less pressure to co-locate with customers than automotive firms (SANDERSON et al. 2008). And the absence of strict just-in-time delivery schemes as known from the automotive industry also reduces pressure on lighting firms to co-locate with component suppliers.

The two industries also differ in terms of knowledge generation. Automotive supply is characterized by a high level of *synthetic* knowledge generation (know-how), in which innovation relies on engineering-based solutions created in close interaction with customers and suppliers. Geographic proximity and frequent interaction along the value chain therefore plays an important role in this industry (ASHEIM et al. 2007, MOODYSSON et al. 2008). The lighting industry is characterized by a mix of *synthetic* (know-how) and *analytical* (know-why) knowledge generation. Its dependence on basic chemistry and physics – at least for groundbreaking innovation – suggests that the embeddedness in international expert communities and the proximity to strong universities plays a more important role in this industry than in automotive supply (ASHEIM et al. 2007, MOODYSSON et al. 2008).

The host countries and regions

At least since the publication of a popular report by Goldman Sachs in 2001, the so-called *BRIC*-countries (Brazil, Russia, India, and China) have been prominent on the corporate agenda of developed-country MNEs (O'NEILL 2001). Over the past two decades, the share of these four emerging economies of the world's GDP and trade has more than doubled.

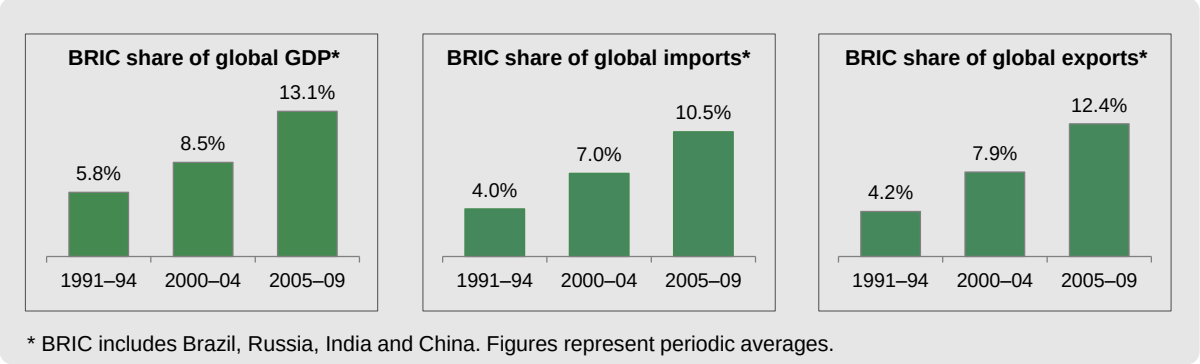

Figure 6: The BRICs and the world economy

Source: IMF (2010, 2011). Figure provided by author.

The dynamic growth of these economies has attracted the attention of many developed-country MNEs. This suggests that high levels of investment and upgrading activity might be observable in MNE subsidiaries located in these the BRIC-countries. Recent reports of ambitious *BRIC-strategies* of MNEs support this assumption (BRUCHE 2009).

Of the world's rapidly emerging economies, China and India are particularly interesting for an investigation of MNE subsidiary evolution. In particular China has experienced rapid growth and has outperformed all other large emerging economies in the past two decades. Growth in India was slightly less dynamic in the 1990s, but has accelerated since the turn of the century.

Figure 7: GDP growth China and India

Source: UNCTAD (2010, 2011b). Figure provided by author.

China and India have also emerged as two of the world's most important destinations for foreign direct investment (FDI), with China capturing more than ten percent of global FDI.

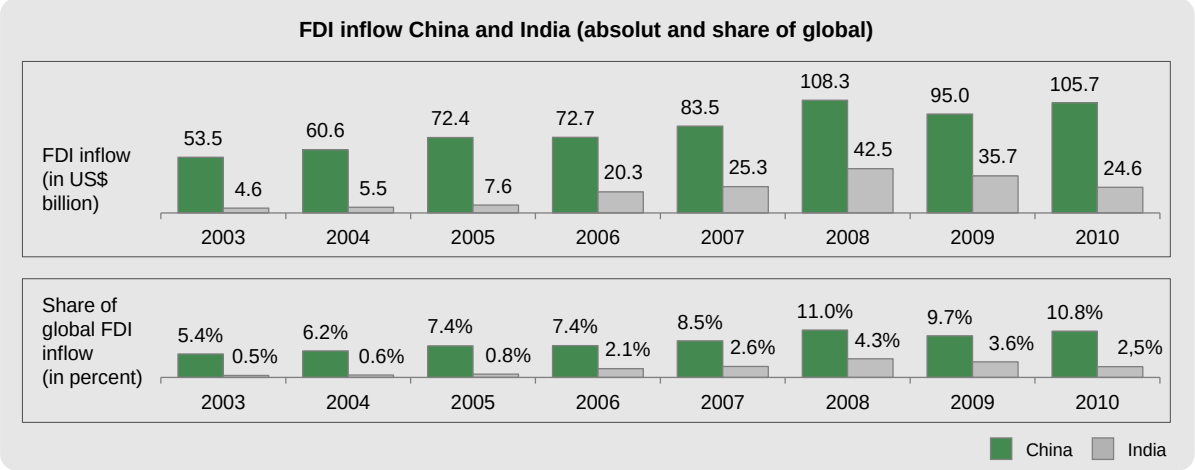

Figure 8: FDI inflows China and India

Source: UNCTAD (2006, 2011a). Figure provided by author.

Owed to the absolute size of their market and the volume of FDI inflows, China and India are among the very few emerging economies which meet the ambitious selection criteria of this dissertation (e.g. multiple subsidiaries per MNE and country). Moreover, due to the fact that they are neighboring countries in South- and East-Asia, they offer opportunities to observe cross-border product, knowledge, and technology flows between MNE subsidiaries in both countries. The two countries are therefore predestined for a study of MNE subsidiary evolution in emerging economies.

Of the two host countries, China enjoyed a head start and demonstrated stronger economic growth, export performance, and FDI inflows than India (UNCTAD 2010). China had started to liberalize its economy for private enterprise and foreign investment in the late 1970s. In the course of the 1980s and 1990s, a range of special economic zones were established with tax benefits, infrastructure, and other incentives for foreign-owned companies (WEI et al. 2008, WTO 2010). In particular since WTO accession in 2001, significant improvements in the regulatory framework for foreign-owned companies were adopted (WTO 2010). China's economic growth was to a large degree fueled by the constant influx of FDI from developed market firms and associated exports of manufactured goods (URATA 2011, WTO 2010).

India started to catch up about a decade later in the early 1990s after liberalizing its economy from a highly-regulated, import-substituting regime towards free enterprise and foreign investment (MONETEK and AHLUWALIA 2002, KOHLI 2006). In comparison to China, India focused less on offering preferential treatment to individual investors and placed most emphasis on deregulating foreign capital and improving the overall investment environment (URATA 2011). Despite the early liberalization policies in the 1990s, economic growth did not fully take off until the turn of the century. Since then, however, India's economy has expanded by high single-digit annual growth rates. In particular since 2002, India has adopted a series of ambitious reforms and tariff reductions (KOHLI 2006, ANSARI and RANGA 2010). As a result, FDI inflows grew from eight billion US$ in 2005 to 42 billion US$ in 2008. However, FDI inflows to India still lag behind its neighbor China, which has attracted 108 billion US$ in 2008. And in terms of net FDI stock, China has attracted about four times the value of India by 2008 (ANSARI and RANGA 2010). FDI in India did not concentrate mainly on (export-oriented) manufacturing, but on (mainly IT-enabled) services (DOSSANI and KENNEY 2009, ANSARI and RANGA 2010). In contrast to export-led growth in China, growth in India was led by strong domestic demand, and imports were growing faster than exports throughout the last decade, leading to a widening of the trade deficit (WTO 2011). Compared to the developed economies, India (as well as China) has experienced a mild

slowdown in the course of the global financial and economic crisis after 2008. Growth bounced back to dynamic levels when the developed economies were still suffering from slow growth. In both countries, this was related to the large domestic markets as well as to ambitious government stimulus packages (URATA 2011, WTO 2011).

China and India also play a pivotal role in the accelerating globalization of R&D in recent years (DUNNING and LUNDAN 2009). Both countries have attracted high levels of R&D-related FDI from developed-country MNEs. The number of MNE R&D centers in China exploded from around 50 in 2000 to up to 1,100 by 2007. Similarly, MNE R&D centers in India grew from around 100 in 2000 to around 600 by 2007 (BRUCHE 2009). While in the case of China this investment has mainly followed market-seeking motives, investors in India have rather followed resource-seeking motives (BRUCHE 2009). At the same time, domestic firms and research institutes have upgraded from providing basic, routine services to knowledge-intensive processes (BRUCHE 2009, DUNNING and LUNDAN 2009).

The six subsidiaries of the two researched MNEs locate in the economic boom regions of China and India.[10] In China, the initial liberalization policies of the central government have favored the coastal regions, which have since then attracted the bulk of FDI inflows (WEI et al. 2008). Of these regions, the Pearl River Delta (PRD) with its pioneering special economic zones has attracted the largest portion of early FDI inflows (over 50 percent) throughout the 1980s (HUANG and WEI 2011). While initially most of this FDI concentrated on Shenzhen and Guangzhou, the neighboring cities including Foshan (→ where L-C is located) have constantly increased their share of FDI inflows. Most FDI was initially directed to labor-intensive industries (e.g. leather and plastics processing) but gradually also to more capital- and knowledge-intensive industries (e.g. electronic equipment) (OIZUMI 2011).

Over the past two decades, the Yangtze River Delta (YRD) has gradually surpassed the PRD in terms of FDI inflows (OIZUMI 2011). Besides Shanghai, the bordering Jiangsu (including Suzhou) and Zhenjiang Provinces have also benefited from FDI inflows. With the establishment of the Suzhou Industrial Park and the Suzhou High-Tech Industrial Development Zone around 2000, the city of Suzhou (→ AC-C) has emerged as one of the largest industrial areas and destinations for FDI in China (HUANG and WEI 2011). The PRD (and in particular Suzhou) features a diversified manufacturing base with strength in telecommunication and electronics equipment, but also in automotive (XIONG 2009).

[10] See Appendix A for a map of the locations of the researched subsidiaries in China and India.

Changsha (→ AM-C), the capital of Hunan Province in South Central China, was excluded from the first wave of FDI-led development in coastal China. Only since the late 1990s, when the central government started to shift focus to inland provinces, economic development in Changsha gained momentum (HUANG and WEI 2011). Changsha is renowned for its traditional strength in higher education. Among China's emerging regions, Changsha features an unusual economic structure with a traditionally weak industrial base and a strong service sector. But with the help of an ambitious investment promotion strategy, Changsha and Hunan Province authorities have induced dynamic industrial development since the turn of the century (HUANG and WEI 2011). By 2009 more than 25 *Fortune 500* companies and many domestic firms have established manufacturing facilities in Changsha (KPMG 2009).

In India, more than 50 percent of FDI inflows since the year 2000 concentrated on Mumbai and Maharashtra state in the West, the National Capital Region (NCR) with Delhi and Haryana state in the North, and Karnataka state with Bangalore in the South (ANSARI and RANGA 2010). The NCR (→ L-I) is the second largest recipient of FDI and has received around 20 percent of FDI inflows between 2000 and 2009 (ANSARI and RANGA 2010). This region has attracted FDI in a variety of sectors including telecommunications, electrical equipment, and transportation. Gurgaon and Noida, two of Delhi's suburbs, have emerged as international centers for software and IT-related services. The NCR is also a preferred destination for domestic investment as well as for talent from the nation's top universities. The industry of L-I (lighting) does not have a strong presence here. But the electrical equipment industry offers a supportive environment for electronic ballast and other lighting components.

Bangalore, the capital of Karnataka state in Southern India, (→ AM-I and AC-I) has become renowned for its IT and IT-enabled services industry, which is responsible for most FDI and economic growth in the region (VANG and CHAMINADE 2006). Bangalore is the home of more than 50 percent of MNE R&D sites in India (BRUCHE 2009). Texas Instruments has set up an IT center in Bangalore already back in 1985, which was to become one of the nuclei for the IT cluster in this city. Bangalore's strength in IT (-enabled services) can be traced back even further to its legacy in defense, communications, and advanced sciences. This legacy, especially in defense-related (mechanical and electrical) engineering, has also induced the development of a fairly strong machinery and electronics sector (DOSSANI and KENNEY 2009). Bangalore is clearly not the center of India's automotive industry, which is concentrated in the West (Pune, Nashrik, Mumbai), the North (NCR), and in Chennai. But it still features a considerable number of foreign and domestic automotive R&D centers as well as some manufacturing plants (KUMARASWAMY et al. 2008).

Part B: Drivers and mechanisms of MNE subsidiary evolution

2 Evidence for subsidiary evolution in the case studies

2.1 Overview of case studies

Of the six case studies, three cases (L-C, AC-C, and AM-C) – all of them located in China – have significantly expanded their product and value-add scope over time and are today viewed as successful role models for subsidiary evolution in their MNEs. In times of economic turmoil in the MNEs' home markets, the solid contribution of these subsidiaries to the MNEs' financial performance as well as their resource and capability pools has reinforced their MNE-internal weight. Interestingly, in terms of geographic scope the trend in all three cases was not towards a more global role, but towards more focus on the domestic market. This being said, there are still differences in the geographic scope of these subsidiaries: L-C exports around 40 percent, AM-C around 20 percent, and AC-C around five percent of its output. All three cases today engage in product development for the domestic market and in some cases also for other emerging economies. They have therefore evolved into the e*merging market leaders* in their MNE. Contributions to entirely new products and basic research, however, remain still limited.

Two cases (L-I, AM-I), both of them located in India, struggled with internal and external challenges and stagnated or even underwent a relative downgrading of their operations. Both cases have a poor track record in their HQ with regard to their past performance. Interestingly, these are the two oldest subsidiaries in the case sample. Despite dynamic growth of their domestic markets, both subsidiaries reduced their headcount and value-add scope over time, relying increasingly on outsourcing and/or imports. The geographic scope of both subsidiaries remained largely domestic. While L-I is unlikely to export anytime soon, AM-I has recently won export mandates and has ambitious export plans for the near future. In terms of R&D, the picture is mixed. While L-I is only performing development activities in a small niche and not for the main product, AM-I is developing variations for the Indian market and was involved in global platform development. However, the prestigious platform development task has recently been lost to China, leaving AM-I again with a predominantly domestic scope. The evolution of these two cases therefore constitutes an interesting contrast to their counterparts in China.

The last case (AC-I) has just recently stabilized its operations. However, it has already undergone an interesting evolution from a narrow product scope with responsibility for Asia-Pacific to a broader product scope with a predominantly domestic focus. It therefore offers an interesting contrast to the other cases in India.

Figure 9 provides a qualitative illustration of these findings regarding the evolution of the geographic and value-add scope of the subsidiaries' manufacturing and R&D operations:

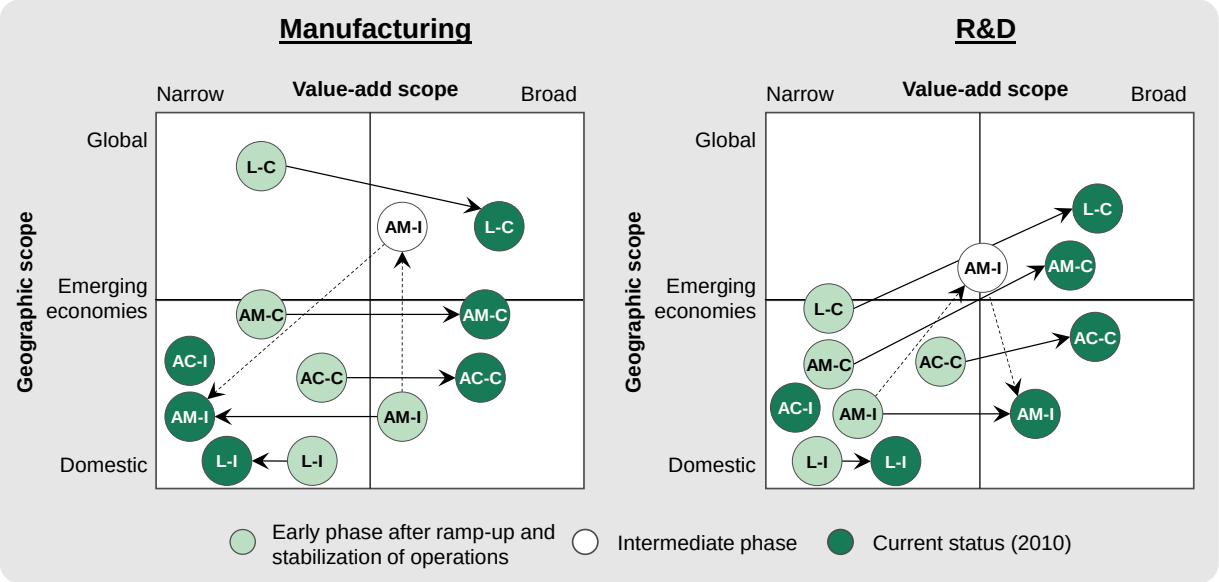

Figure 9: Evolution paths in the case studies[11]

Source: Figure provided by author.

2.2 Evolution path per case study

Of the three highly successful subsidiaries in China, **L-C** in Foshan has the longest history. Its early phase (1995 to 2000) was characterized by external and internal barriers and challenges. L-C was initially set up as a *Replica (Adopter)*, but because sales in the domestic market did not pick up as planned, exports to the global market dominated the early phase. L-C's mandate has therefore also included a strong *Rationalized Manufacturer (Global)* component.

After the operations had been stabilized around 2000 and the domestic market of L-C's products started to surge, a phase of dynamic growth began (2000 to 2005). The volume and scope of L-C's manufacturing operations expanded rapidly. Production technologies were upgraded, rationalization measures initiated, and product development capabilities established. Between 2003 and 2004, the headcount of L-C increased from 1,700 to 3,000.

[11] This figure illustrates the evolution of the subsidiaries along the geographic and value-add scope of their operations. It distinguishes between the manufacturing and R&D function of the subsidiaries. The absolute and relative position of the subsidiaries in the figure is based on a qualitative assessment of case study evidence and for illustrative purposes only.

After 2005, L-C evolved into a key pillar of the global strategy of L-PARENT. As a manufacturing location for several of the MNE's product units, L-C developed into one of the most complex plant in the MNE. The recent establishment of a LED assembly facility further broadened the scope of its operations. After another strong increase by 1,000 employees in the year 2008, L-C now has more than 3,500 employees. While certain value chain steps were recently outsourced for efficiency reasons, other responsibilities were taken over. This included the establishment of a machine building division – one of only few of such facilities in L-PARENT worldwide. In recent years, growth in domestic sales has outperformed export growth, gradually shifting L-C's geographic scope towards the domestic market. Product development gained momentum, and L-C has generated several low-cost variations for the Chinese market. In 2009, the subsidiary took over the responsibility for R&D activities for Asia-Pacific, reinforcing its role as one of the lead plants for emerging economies. In order to meet these new responsibilities, the number of engineers in L-C has more than doubled since 2009 to over 100 by the end of 2010. The upgrading of L-C is also illustrated by its recent application for *high-/new-technology enterprise* status, a tax-benefit program for firms with a high share of *knowledge workers* and activities in new technologies.
In sum, L-C has evolved from an *Adopter* to *Adapter type* of *Replica*. Today it is on the brink of the *Innovator type*, but its overall R&D output is still limited. With the new R&D role in Asia-Pacific, L-C could be viewed as a *Replica with regional mandate*. At the same time, L-C continued to serve as *Rationalized manufacturer* for the global market. In some areas, where the bulk of L-PARENT's output is generated in Foshan, L-C has already assumed a global *Product Specialist* role. Centralized decision making and control from the global HQ have so far prevented a shift towards a *Strategic Independent Unit*.

In the initial phase (1999 to 2004), **AC-C** in Suzhou has served as a stepping stone to China for various business units (BUs) of A-PARENT. One of the founding BUs departed in 2002 to create a new JV with a Chinese partner. Another BU departed in 2005 to a new site in Changsha. This phase was therefore more a sequence of episodes than a continuous evolution.
Starting 2004, the electronics BU set up manufacturing operations at AC-C. At that time, less than 100 people were employed. Between 2004 and 2008, all major product families required by the Chinese market were localized successfully to AC-C. Its operations were mostly replications of global processes with state-of-the-art technology and some modifications to local requirements. As A-PARENT followed a stringent *local-for-local* strategy, the geographic scope of AC-C was limited to China with few exports to Asia-Pacific. AC-C was

therefore set up as a *Replica (Adopter)* subsidiary. The R&D team of AC-C focused on achieving the required quality levels and providing a technical window function to local customers, while most product development for China continued to take place in Europe.

By 2008, AC-C took over full responsibility for its manufacturing operations from the German lead plants. The manufacturing mode switched from ramp-up to mass production, while at the same time the number of product types expanded from initially four to more than twenty by 2008. First measures were initiated to modify manufacturing processes to domestic requirements. The development team began to work on sophisticated applications of products for domestic customers and to develop low-cost versions of products. The first locally developed product went into production in 2010. Other China-specific products are currently under development. Once completed, these products will be used also in other emerging economies. In terms of product design and development, AC-C is today among the most sophisticated units of A-PARENT in China. In recent years, AC-C was also increasingly used as pilot plant for process development for new (global) products. After five years of continuous hiring, the headcount of AC-C has reached 1,300 in the electronics BU and 4,000 including other BUs and support functions in the Suzhou plant.

In sum, AC-C had undergone a dynamic evolution into a strong manufacturing hub for China with its own product and process development. The domestic focus means that AC-C maintained its *Replica* role, but upgraded to an *Adapter* and – at least partially – an *Innovator type*. AC-C's leading role in the development of low-cost variations for emerging economies means that it is gradually evolving into a *Development Specialist* for emerging economies.

AM-C in Changsha was started with the acquisition of a licensee-partner's facilities in Changsha in 2004. The facilities were continued as a wholly-owned venture. After the acquisition, selected manufacturing operations were transferred from Germany to the new location. Additionally, some manufacturing operations of another BU were moved from the Suzhou plant (AC-C) to Changsha. Initially, AM-C was established to manufacture A-PARENT's products with minor application for the domestic market – a typical *Replica (Adopter)* set up. During the ramp-up phase (2004 to 2008), the value-add of AM-C was gradually increased from simple assembly to full-fledged manufacturing. In 2005, the headcount of AM-C was around 400, thereof mostly workers of the former owner. The capabilities of this local staff were hardly sufficient to operate the new lines transferred from Germany. It was only after joint efforts with experts from A-PARENT that a stabilization of

manufacturing was achieved. The engineers of AM-C at the time supported mostly manufacturing and sourcing activities. Product development did not yet take place.

After a moderate start, the evolution of AM-C accelerated after 2008 when domestic sales picked up. The subsidiary now nearly doubled its headcount and output every year, and a series of new products was transferred from Germany. By 2010, the initial product lines had been replaced by an entirely new generation. The complexity of manufacturing technologies remained on a similar level throughout this dynamic evolution. But the complexity of managing AM-C's manufacturing operations has increased recently when it begun to *insource* a number of components formerly supplied by external suppliers in Europe – turning the subsidiary into one of A-PARENT's plants with the highest manufacturing depth. While exports to neighboring countries in Asia constitute up to 25 percent of AM-C's production, its main focus is the domestic market. In the course of the rapid growth since 2008, AM-C's headcount has increased to more than 2,500 people. Concerning R&D, AM-C's engineering team has begun to localize components and materials around 2007. At the same time, the application of products to domestic customers was localized to AM-C, and a new test lab and sample shop was established. Since 2009, the engineering team has focused increasingly on China-specific product development. This upgrading of the R&D scope culminated in the assignment of the responsibility for platform development for emerging economies in 2010. To meet these new responsibilities, the number of engineers increased manifold to over 300 by the end of 2010.

In sum, AM-C had undergone a tremendously fast upgrading into a strong manufacturing and development center for China and Asia-Pacific with a responsibility for emerging-economy-specific platforms. AM-C 's role has therefore evolved from an *Adopter* to an *Adapter Replica* in the Chinese market, with additional functions as *Rationalized Manufacturer* for Asia-Pacific and *Development Specialist* for low-cost platforms for emerging economies.

In contrast to L-C in China, **L-I** in Delhi-Sonepat did not experience a strong upgrading of its MNE-internal role. In the early phase (1993 to 1998), L-PARENT had entered the Indian market with a manufacturing joint venture in a different location in North India. After an encouraging start, L-PARENT acquired the facilities of a domestic lamp manufacturer in Sonepat, Haryana state, in 1998 to establish a wholly-owned manufacturing site for the domestic market – a *Replica (Adopter)* subsidiary. In the following years (1998 to 2007), equipment and capabilities of L-I were modernized, new product lines transferred from Germany, and a range of older product lines phased out. L-I's headcount increased from less

than 1,000 to over 1,400 people by 2001. Promising growth in the domestic market and capacity constraints in the years until 2007 motivated the establishment of a second plant next door for the transfer additional product lines to India. Engineering activities in the plant were limited to rationalization projects and small adjustments to the domestic market. However, some product development was going on in the niche of electronic control gear for lighting products. In the course of a global acquisition by L-PARENT in 2001, an electronics R&D center in Delhi was integrated into L-I. This former offshore R&D center for the US market continued to develop electronic components for the subsidiary of A-PARENT in the US.

The global financial and economic crisis after 2008 marked the beginning of a turmoil phase for L-I. The crisis delayed the finalization of the new manufacturing plant and led to the termination of several designated product line transfers. Around the same time, L-I decided to outsource four lines of an older product family. Consequently, the new plant suffered under low utilization once finalized, and in fact it has remained half empty until today. Some of the designated product lines got eventually transferred in 2009 and 2010. This constituted a clear upgrading of L-I in technological terms. However, the new products did not generate the expected volumes in the market. Low utilization, together with low productivity and significant overhead costs, put increasing pressure on L-I's financial situation. While the products manufactured by L-I did not generate good volumes, the import business and third-party outsourcing business was more promising, which has increasingly motivating subsidiary management to focus attention on this business. As a consequence, L-I's in-house value-add in products sold in the domestic market dropped below 50 percent. As a consequence of increased outsourcing and rationalization efforts, site headcount decreased over time to 1,200. The significant downsizing in manufacturing was balanced out by a doubling of R&D and sales staff. The development of electronics for the US market continued to thrive. At the same time, R&D efforts for the Indian market were intensified, and by 2010 more than 50 percent of L-I's R&D resources focused on such domestic projects. However, these R&D remained concentrated on electronic control gears, while R&D for the main product – the lamp – did not yet make much leeway.

In sum, while L-I has modernized manufacturing and added some new products, large-scale mass production and/or technological upgrading has never really picked up. The outsourcing of parts of its operations to external partners has reduced the value-add scope of the plant. The geographic scope remained entirely domestic, and the scope of R&D operations remained marginal. L-I has therefore largely maintained its initial *Replica (Adopter)* role, but with a

trend towards a *marketing satellite* if the value-add of the plant continues to get outsourced. In the electronics niche, however, L-I has established itself as a *Development Specialist.*

Despite having a much longer history, **AM-I** in Bangalore failed to match the performance of its Chinese counterpart in almost every category. In fact, the all-time high of operations lies already one decade behind. AM-I was set up in 1987 and fully operational in 1989. It started manufacturing with few product lines transferred from Germany. Additional lines from another Indian site were transferred to AM-I shortly after. Initially, AM-I produced the products of A-PARENT for the Indian market with minimal modifications – a classical *Replica (Adopter)* role. In the first decade of operation (1989 to 1998), output grew only slowly and the manufactured portfolio remained limited. Towards the turn of the century, the output growth of AM-I accelerated with its entry in new product markets (e.g. passenger cars) and the acquisition of export mandates to Europe – transforming AM-I into a *Rationalized Manufacturer*. Output and staff peaked around 1998 when more than 1,300 blue collar workers and more than 100 staff were employed in the plant. The value-add of the plant gradually increased, and under the guidance of German experts Indian engineers began to localize products to domestic requirements.

The peak around 1998 was followed by a rapid downgrading of operations (2000 to 2005). By 2000, most export orders were lost due to various reasons, and AM-I was increasingly facing overcapacities. Gains in the domestic market could not compensate for this loss. Consequently, parts of AM-I's headcount was shifted to other Indian sites, and in fact until 2007 no new (blue collar) staff was recruited. In response to the deteriorating competitive position of AM-I, the manufacturing of most components and sub-assemblies was outsourced to domestic firms. By 2005, only about 20 percent of the value-add in AM-I's products was left in-house. Adding to this, one of the BUs at AM-I has moved its operations to another plant in India. These events left AM-I with reduced headcount, output, and value-add.

New product developments in AM-I and in A-PARENT from 2006 onwards should again change the evolution path of AM-I. The development of new emerging-economy specific platforms has generated opportunities for AM-I to manufacture products for customers in other emerging economies. By the end of 2010, promising export mandates have been secured. While the in-house value-add of AM-I remains on a very low level, some of the outsourced activities might soon be brought back to the plant in the course of the promising output growth in recent years. While the manufacturing function has reduced its scope over time, the R&D team has gradually gained confidence and intensified its activities. In a joint

effort with Brazil and Germany, Indian engineers have contributed to the development of new product platforms, which were launched in 2009. This was the first time an emerging-economy-specific platform had been developed in this BU of A-PARENT, and the first time AM-I has led a global project. However, this project leadership role has been lost recently with the decision of A-PARENT to consolidate platform activities in China. At the same time, AM-I has started to develop dedicated products for Indian requirements.

In sum, after some ups and downs AM-I is today left with a *Replica* role with little value-add in manufacturing, but increasingly sophisticated product development (although still very basic by the MNE's global standards). It has therefore evolved into an *Adapter* type of *Replica*. The fact that AM-I has recently secured several larger export orders suggests that it might be on the way to evolve (again) into a *Rationalized Manufacturer* for the world market.

AC-I in Bangalore was set up in 2008. This late start is mostly related to the fact that the use of electronic controls – the main product of AC-I – in the Indian automotive sector has lacked behind the European and also the Chinese market. AC-I was established in a separate area next to the existing AM-I plant. It belongs to a separate organizational and legal entity, and contacts to AM-I are in fact very limited. AC-I started its operations with state-of-the-art production lines designed in Germany. The production concept for the start-up phase has restricted AC-I to one product family, which was delivered to the domestic market, but also to Asia-Pacific (mainly China). AC-I has therefore started as a *Rationalized Manufacturer* for Asia-Pacific. After one and a half years, the production concept was changed and AC-I has expanded its product scope to all product groups sold in India, while exports to Asia-Pacific were terminated. While the increased variety and sophistication of products manufactured by AC-I has led a higher complexity in the coordination of manufacturing, the actual value-add steps in manufacturing have remained more or less constant. AC-I maintains a lean structure with about 120 employees, thereof about 70 workers in manufacturing. AC-I is currently not engaged in R&D activities. In the past, a separate unit of A-PARENT in Bangalore has performed offshore R&D activities in the product area of AC-I. While this unit has initially focused on the European market, it has increasingly focused also on the emerging Indian market. While not yet formally part of AC-I, the R&D activities of this separate unit might be consolidated under the AC-I umbrella in the near future.

In sum, AC-I has evolved from a *Rationalized Manufacturer* for Asia-Pacific into a *Replica (Adapter)* for the domestic market. Once the separate R&D unit gets integrated into AC-I, the subsidiary will also take on the role as a *Development Specialist* for the MNE.

3 Drivers in the MNE-internal environment

3.1 Introduction

In an increasingly dynamic and complex globalized business environment, MNE subsidiaries play an important role in the MNE-internal environment as market frontends, rationalized (global) manufacturers, and vehicles for expanding the MNEs global knowledge and capability pool. While the latter role has long been assumed to be limited to developed countries, it has become apparent that subsidiaries in emerging economies too can and must contribute to the MNEs competitive advantage (BRUCHE 2009). The ability (and willingness) of a subsidiary to effectively fulfill these roles is likely to evolve over time. While some subsidiaries create unique capabilities and develop into global centers of excellence, others stagnate or even cease to exist. Such an evolution can strengthen or weaken the MNE-internal environment and its competitive advantage. These observations have inspired considerable research on the trajectories and causes of MNE subsidiary evolution – mainly in International Business (IB)/Strategic Management.

At least since VERNON's (1966) product life cycle concept, it is well established in IB/Strategy literature that subsidiaries can take on different roles, and that these roles can change over time. While this literature has long been dominated by an HQ-centric view, a new subsidiary-centric literature stream has developed since the 1990s (BIRKINSHAW and HOOD 1998). Built on considerations of the resource-based and dynamic capabilities view, it explicitly recognizes subsidiary-driven, cumulative, and path-dependent evolution paths.

Owed to the increasing complexity of multiple-embedded MNE organizations, the internal dynamics of HQ-subsidiary and subsidiary-subsidiary relations have received considerable research attention (BIRKINSHAW et al. 2005, BOUQUET and BIRKINSHAW 2008, LI et al. 2009, GARCIA-PONT et al. 2009, MEYER et al. 2011). This attention is motivated by the observation that "*[…] the nature of the internal competitive arena is more complex than we had previously recognized*" (BIRKINSHAW et al. 2005: 246).

However, conceptual and methodological shortcomings in this literature might still restrict the understanding of MNE-internal drivers and underlying mechanisms of subsidiary evolution. It is now well established to distinguish between a subsidiary's vertical linkages with the HQ and horizontal linkages with sister subsidiaries (TAVARES 2001). However, both vertical and horizontal linkages might not be as homogenous as commonly assumed. Among other factors, the co-existence of collaborative and competitive behavior in MNE-internal relations

and of sister-subsidiaries in a same host country (a situation most *Fortune 500* firms face in a country like China) has been largely neglected in the literature.

The aim of this chapter is to address these shortcomings in regard to the MNE-internal drivers of subsidiary evolution, and to contribute to the literature in two ways: firstly, by developing a multi-level framework of subsidiary evolution which reflects the complexity of the MNE-internal environment; and secondly, by applying this framework to subsidiaries in China and India to investigate the drivers and underlying mechanisms of their evolution over time.

This dissertation has an exploratory character. Owed to limitations of research scope and methodology, not all shortcomings in the literature can be addressed, and the potential for generalizations beyond the researched MNEs, industries, and countries, is limited. However, this dissertation can contribute to the literature by revealing firm-level drivers and mechanisms of subsidiary evolution which have so far been overlooked in the literature.

The remainder of this chapter is arranged as follows: the next section summarizes findings of the literature on subsidiary-endogenous and MNE-internal drivers of subsidiary evolution. Building on this review, a conceptual framework for subsidiary evolution is presented. The following sections present empirical insights from the case studies with regard to drivers of subsidiary evolution on the subsidiary-endogenous level as well as in vertical (HQ) and horizontal (sister subsidiary) relations. A discussion of key findings concludes the chapter.

3.2 Literature review

Earlier, transaction-cost-based conceptualizations of the MNE assumed that ownership-specific advantages are mainly developed in the HQ and exploited by the subsidiary (DUNNING 1981). But in the light of increasingly global and complex business environments, it became apparent that these advantages could also be created in the subsidiary itself. The advantage of the MNE could therefore be its ability to access the unique capabilities of its subsidiaries and distribute them in the MNE-internal network (BIRKINSHAW and HOOD 1998). This thinking is reflected in modern network models of the MNE as *differentiated networks* (GHOSHAL and NOHRIA 1997). It reflects the trend observable among the world's largest MNEs from resource-, market-, or efficiency-seeking towards strategic asset-seeking FDI motives, and from home-base exploiting towards home-base augmenting subsidiary roles (KUEMMERLE 1999, CANTWELL 2009).

The growing awareness for the uniqueness of subsidiaries in the MNE network has motivated researchers to shift attention on the subsidiary level as unit of analysis and to investigate the

new roles played by subsidiaries and the reasons for variations between them. In particular since the late 1990s, Strategic Management literature has developed a dynamic view on the evolution of subsidiary roles (BIRKINSHAW and HOOD 1998, FROST et al. 2002, BENITO et al. 2003). In the seminal paper of BIRKINSHAW and HOOD (1998), subsidiary evolution is understood as the change of operations and the enhancement or depletion of capabilities of a subsidiary. This can be the result of head-office *push* to up- or downgrade subsidiary operations, of subsidiary choice to upgrade its capabilities and/or to *pull* new operations from the HQ, and *environmental determinism*. The magnitude of these evolution drivers depends on a range of *context factors* (e.g. relevance of the host market or entrepreneurial orientation of subsidiary managers). TAVARES (2001) extends this framework by introducing a multi-level perspective on the MNE-internal environment including relations to sister subsidiaries (horizontal linkages). More recently, several authors have promoted a relational approach to subsidiary evolution by focusing on the embeddedness of subsidiaries in the MNE-internal network and how this influences MNE-internal and -external knowledge exchange and the evolution of individual subsidiaries (ANDERSSON et al. 2007, PHENE and ALMEIDA 2008 GARCIA-PONT et al. 2009).

The conceptualization of a subsidiary-driven evolution path builds on the resource-based and dynamic capabilities view as well as on evolutionary concepts (PENROSE 1959, WERNERFELT 1984, TEEECE et al. 1997). It views subsidiary evolution as a path-dependent process of generating and accumulating unique capabilities, which might in turn attract new mandates from the HQ and thereby induce subsidiary evolution (BIRKINSHAW and HOOD 1998, YAMIN 1999). Such capabilities are often location-bound as their tacit and contextual character makes them difficult to transfer (KOGUT and ZANDER 1993).

The dynamics in the MNE network facilitating or impeding the evolution of a subsidiary's operations can be analyzed from different perspectives. From a Strategic Management perspective, subsidiary roles are shaped by the strategic response of the MNE to challenges and opportunities in the environment. According to the *Integration-Responsiveness* framework, pressure from global markets and industries for a global integration of operations and pressure from national/regional markets for local responsiveness determine the MNE's strategy and therefore also the role of a particular subsidiary and its potential to upgrade its operations over time (PRAHALAD and DOZ 1987).[12]

[12] The Integration-Responsiveness framework distinguishes MNE strategy in international, multinational, global, and transnational types depending on the global integration and local responsiveness of the MNE's operations.

A different perspective on the MNE-internal environment is provided by *resources dependence theory*. In Strategic Management, this approach has been applied to investigate the power of actors in the MNE based on the control of strategic resources (PFEFFER and SALANCIK 1977, MUDAMBI and PEDERSEN 2007). In the context of subsidiary evolution, this concept suggests that the accumulation of strategic resources by a subsidiary might reduce its dependence on the MNE and might lead to a more interdependent relationship with the MNE, which might in turn strengthen a subsidiary's bargaining power in negotiations for resources and mandates (BIRKINSHAW and HOOD 1998, MUDAMBI and PEDERSEN 2007). The dynamics of the MNE-internal environment might therefore be governed by bargaining power and processes between the differentiated units of the MNE.

The literature on subsidiary evolution suggests a range of evolution drivers in the MNE-internal environment. Potential drivers on the subsidiary-endogenous level include the subsidiary's set of resources (e.g. human capital) and capabilities, its initiatives towards enhancing its operations, and its characteristics in terms of ownership, entry mode, size, and age (BIRKINSHAW and HOOD 1998, KOKKO and KRAVTSOVA 2008). A subsidiary's human capital, and in particular its capacity to absorb new internal and external knowledge, is emphasized in several studies as an important determinant for the accumulation of subsidiary-specific capabilities (PHENE and ALMEIDA 2008). *Entrepreneurship* and upgrading initiatives on the subsidiary level are also found to constitute important determinants of subsidiary evolution (DOERRENBAECHER and GAMMELGAARD 2006, EGERAAT and BREATHNACH 2008, GARCIA-PONT et al. 2009). Evidence with regard to subsidiary age is inconclusive. FUCHS and WINTER (2009) suggest that older subsidiaries are more likely to have been confronted with technical challenges at some point in their history, which might lead to higher levels of *technical-organizational competencies* in these subsidiaries. And YAMIN (1999) suggests that subsidiary age translates into embedded external networks, which might in turn induce the creation of innovative capabilities and the upgrading of a subsidiary's MNE-internal role. Other studies, however, do not find evidence for an important role of age for the evolution of a subsidiary's capabilities and operations (KOKKO and KRAVTSOVA 2008). Part of the subsidiary-endogenous dimension is also the entry mode and the associated legacy of a subsidiary in the host environment. YAMIN (1999) and KOKKO and KRAVTSOVA (2008) argue that *acquired* subsidiaries are more likely to maintain links to external partners and to generate innovative capabilities (at least in the early phase), but have more difficulties to integrate their knowledge and processes internally into

the MNE. Overall, however, the link between a subsidiary's legacy and its evolution over time remains an under-researched contingency.

Potential drivers in vertical relations of a subsidiary with the HQ include strategies and attitudes of HQ managers, compensation and incentive systems for HQ and subsidiary managers, support from the HQ in the form of resource and capability transfers, and the level of decision autonomy granted to a subsidiary (BIRKINSHAW and HOOD 1998). With regard to MNE strategy, EGERAAT and BREATHNACH (2008) find that the strategic decisions of MNEs to co-locate of their R&D operations with existing manufacturing plants have induced the upgrading of pharmaceutical subsidiaries in Ireland. Similarly, HOBDAY and RUSH (2007) observe in a study on MNE subsidiaries in Thailand that "*[…] the main determinant in technological transfer and local capability development was overall corporate strategy and, in particular, the way Thai subsidiaries fitted into the international division of technological and production activities*" (HOBDAY and RUSH 2007: 1348). With regard to HQ-level resistance to subsidiary evolution, BIRKINSHAW and HOOD (1998) emphasize the relevance of ethnocentric attitudes in the HQ. DOERRENBAECHER and GAMMELGAARD (2006) demonstrate how such ethnocentric attitudes have impeded an upgrading of MNE subsidiaries in Hungary. Focusing on social relations and embeddedness, several studies suggest that *strong ties* in HQ-subsidiary relations induce an upgrading of subsidiaries. GARCIA-PONT et al. (2009), for example, find that a subsidiary's embeddedness in the MNE facilitates the development of a unique capability portfolio and might in turn translate in bargaining power to foster an upgrading of its operations.

Potential drivers in horizontal relations with sister subsidiaries include competition (e.g. for resources or markets) as well as collaboration (e.g. joint R&D projects). DOERRENBAECHER and GAMMELGAARD (2006), for example, find that fierce MNE-internal competition has prevented an upgrading of German subsidiaries in Hungary. Similarly, Delany (1998) observes that changing market conditions and/or poor management in a particular subsidiary can induce the upgrading of another subsidiary of the MNE. BIRKINSHAW et al. (2005) find that competitive bidding among an MNE's subsidiaries can encourage subsidiary-level upgrading efforts and might therefore stimulate a subsidiary-driven evolution. However, this might only be true for up to a certain level of competition after which the effect becomes negative due to adverse behavior of individual subsidiaries.

The impact of the external environment is not in focus in this chapter. However, there are of course important external influences on decisions in the MNE-internal environment as well as on the capabilities and initiatives on the level of the subsidiary which must be taken into

account. EGERAAT and BREATHNACH (2008), for example, show how changing national and global regulations and tax regimes have motivated pharmaceutical MNEs to upgrade their subsidiaries in Ireland. Such influences from the external environment will be covered briefly in this chapter and will be subject to a dedicated discussion in *chapter four*.

This review illustrates a rich body of literature on MNE subsidiary evolution. However, due to a range of conceptual and methodological shortcomings this literature still falls short to capture the full complexity of subsidiary evolution in the MNE-internal environment.

Firstly, there are shortcomings in the conceptualization of the MNE-internal environment. It is now well established to distinguish between vertical relations with the HQ and horizontal relations with sister subsidiaries (TAVARES 2001, PHENE and ALMEIDA 2008). But most studies either reduce vertical relations to the global corporate HQ or simply aggregate the entire MNE-internal hierarchy under the term HQ. In terms of horizontal relations, *sister subsidiaries* are commonly treated as a homogenous group (see e.g. BIRKINSHAW and LINGBLAD 2005). However, vertical and horizontal relations might not be as homogenous as commonly assumed in the literature. Subsidiaries are likely to maintain vertical relations on different geographic and organizational levels, and sister-subsidiaries are likely to differ in terms of their geographic proximity and their type of relation. These aspects can be assumed to influence subsidiary evolution and should therefore be integrated into the analysis.

Secondly, a subsidiary's horizontal relations to sister subsidiaries have not received sufficient attention in the literature. Only few studies pay attention to the coexistence of collaborative and competitive behavior of subsidiaries of in the MNE network (BIRKINSHAW et al. 2005). And those studies investigating horizontal relations mostly ignore the presence of sister subsidiaries in the same country – a common scenario of larger MNEs in large host countries such as China. Given their proximity and their shared challenges and experience, these units might be more inclined to collaborate, but also to compete for resources and/or customers.

Thirdly, many studies on subsidiary evolution limit the collection of data to their focal subsidiaries. But given the important role of relations between the different actors in the MNE network, such a strategy runs the risk of producing biased information (see e.g. DAVIS and MEYER 2004, MIAO et al. 2008). Subsidiary-level data should therefore be complemented with data from the MNE HQ and – ideally – from sister subsidiaries.

3.3 Conceptual framework

In order to address (some of) the shortcomings in the literature on subsidiary evolution, a conceptual framework based on the work of BIRKINSHAW and HOOD (1998) and TAVARES (2001) was designed. In this framework, subsidiary evolution is conceptualized as a dynamic process of interacting forces in the subsidiary-endogenous and MNE-internal environment, as well as of indirect influences from the external environment.

The subsidiary-endogenous environment is "*[…] underpinned by the subsidiary's inner logic of proactive actions and capabilities*" (Tavares 2001: 143). A subsidiary might accumulate capabilities and thereby reinforce its mandate or engage in *lobbying* the HQ to attract additional mandates. An assessment of these endogenous drivers requires an analysis of a subsidiary's resources, capabilities, and upgrading initiatives as well as of path-dependent processes on the subsidiary level.

The MNE-internal environment includes a range of subsidiary evolution drivers on the level of the HQ and sister subsidiaries. The HQ can proactively assign or terminate mandates, transfer capabilities, and tolerate or impede subsidiary-level initiatives. Sister subsidiaries can influence subsidiary evolution by enabling and/or motivating initiatives of the focal subsidiary as well as by competing for resources and mandates in the MNE. In order to capture the complexity of these drivers, this dissertation extends the framework of TAVARES (2001) into an embedded, multi-level design:

Vertical relations with the HQ are disentangled in geographic and organizational terms. In geographic terms, a subsidiary's relations to the global HQ might be complemented by relations to a *macro-regional* HQ (e.g. for Asia-Pacific) and a HQ in the host country. In organizational terms, the subsidiary might maintain a direct reporting line to the business unit (BU), while the impact of the corporate HQ on the subsidiary (e.g. MNE-wide policies) might a more indirect one. A subsidiary's vertical relations on these different geographic and organizational levels can be assumed to be characterized by different priorities, information and resource access, as well as power of actors. It is therefore important to disentangle these levels in an analysis of subsidiary evolution.

Horizontal relations with sister subsidiaries are also disentangled in geographic and organizational terms. In geographic terms, sister subsidiaries can locate in distant locations, in neighboring countries (here: in Asia), or in the same country. It is plausible to assume that collaboration and competition among sister subsidiaries in the same host country will be more intense than among distant sister subsidiaries, since geographic and cultural proximity might facilitate collaboration and access to the same markets and customers might provoke

competition. In organizational terms, sister subsidiaries can be *same-BU sisters* (part of the same sub-organization with similar products and/or technologies), *integrated sisters* (internal suppliers or customers in same or different BU), or *lateral sisters* (limited overlap in products, technologies, and organization). These organizational aspects can be assumed to influence the character of inter-unit relations. While same-BU sisters might have the highest potential for collaboration, they also face the highest risk of competition as a result of overlapping product or geographic scopes. Integrated sisters might be forced to collaborate in order to achieve their own targets, but might at the same time compete with each other for value chain steps and resources. With their limited overlap, lateral sisters might show the least potential for competition and collaboration. The absence of competitive pressure, however, might facilitate collaboration in areas of mutual interest – in particular on the host country level.

Influences from the external environment will be considered only briefly in this chapter and will be subject to a detailed analysis in *chapter four*.

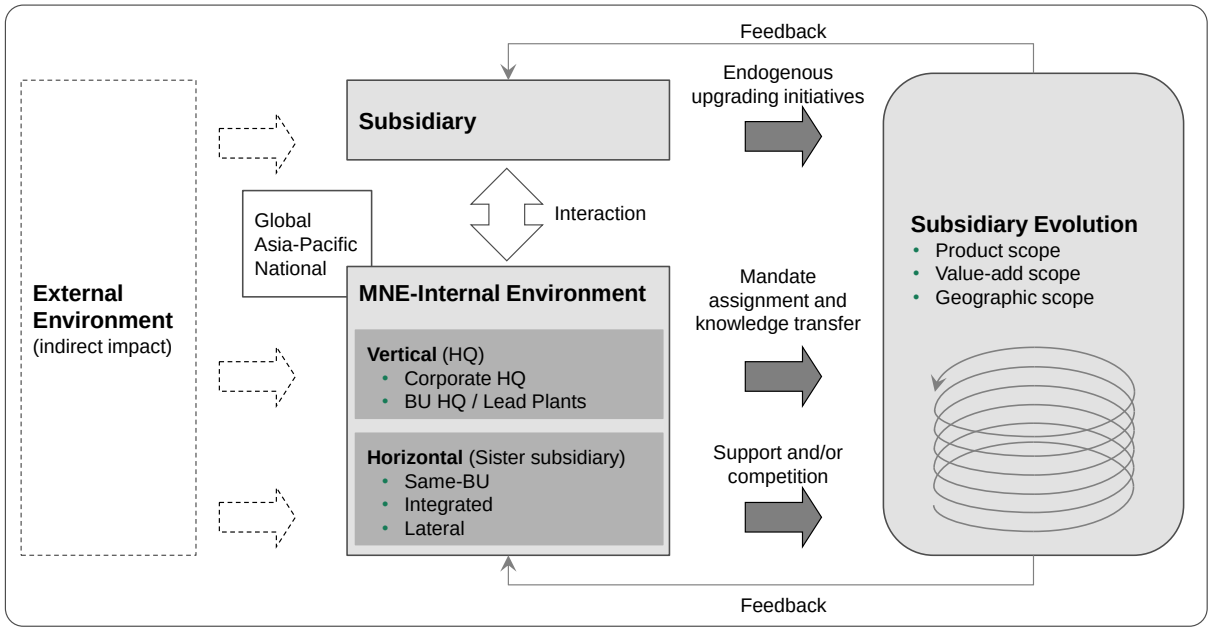

Figure 10: Framework of evolution drivers in the MNE-internal environment

Source: Figure provided by author.

It is reasonable to assume that the various evolution drivers on the subsidiary-endogenous level and in vertical and horizontal relations are interrelated. These interrelations will be investigated accordingly in the analysis.

In the following, this conceptual framework will be applied to the six case studies in China and India to reveal the drivers and mechanisms of their evolution over time. The next section (3.4) will discuss drivers and mechanisms on the subsidiary-endogenous level. Section 3.5

will discuss vertical relations with the HQ, while section 3.6 will discuss horizontal relations with sister subsidiaries. Section 3.7 will summarize the findings of this chapter.

3.4 The subsidiary-endogenous level

This section presents findings from the case studies regarding evolution drivers and underlying mechanisms on the level of the subsidiary. It includes aspects related to a subsidiary's history and legacy in the host environment, labor relations, upgrading initiatives, and accumulation of capabilities.

Subsidiary age and timing of establishment

The most basic model of subsidiary evolution assumes a linear upgrading over time (BIRKINSHAW and HOOD 1998). It assumes that a subsidiary will accumulate capabilities more or less automatically, which will eventually attract new mandates from the HQ.

Interestingly, the case studies show the reverse picture. While two of the youngest subsidiaries (AM-C and AC-C) underwent a rapid upgrading of their manufacturing and R&D operations and are today regarded as role models in their MNE, the oldest subsidiaries (L-I and AM-I) remained on a lower evolutionary stage and have a rather poor track record in their MNE. However, the analysis suggests that this observation is not related to age, but to a range of other country- and subsidiary-specific factors which may compensate the advantage of age proposed in the basic evolution model above. Only for the youngest subsidiary, AC-I in India, age plays a crucial role for the observed evolution path. In the two years of operation (which were mainly characterized by a ramp-up of operations), this subsidiary did simply not have enough time to accumulate capabilities and/or gain independence from the HQ.

Instead of focusing on the years since establishment, it may be more interesting to look at the timing of establishment. The two older Indian subsidiaries (L-I and AM-I) were established when the Indian market was still considered peripheral by the two MNEs. The subsidiaries did therefore receive only limited HQ attention and support in the initial one or two decades. In contrast, the late movers have enjoyed a much better start. When AC-C and AM-C were established in China around 2005 and AM-I in India in 2009 in booming domestic markets, the subsidiaries received full HQ support and the latest technologies, which enabled a smooth start and a rapid catching up with sister subsidiaries in other locations. These observations indicate that the timing of establishment of a subsidiary might be equally or even more important for its evolution path than subsidiary age.

Legacy and path-dependent mechanisms

The case study analysis reveals a range of subsidiary-endogenous factors which have prevented an *automatic* upgrading of the oldest subsidiaries in the case sample. Among them is the legacy related to the subsidiary's history in the host environment. The idea that a subsidiary's legacy might influence its development over time builds on evolutionary concepts of path dependence. The entry mode of the MNE in the host country plays an important role in this context. While *greenfield* ventures are often smaller versions of the parent organization with similar processes and technology, *brownfield* ventures can come with a strong local legacy which sets a subsidiary apart from the rest of the MNE. This legacy can influence the characteristics of a subsidiary (e.g. capabilities and physical facilities), MNE-internal relations (e.g. relations between subsidiary and HQ management), and external relations (e.g. existing domestic suppliers or networks) (YAMIN 1999).

The two Indian cases (L-I and AM-I) demonstrate how such a legacy can influence the evolution of subsidiaries over time. The *brownfield* venture L-I in Sonepat has acquired an old plant, production equipment, workers, and established processes. More than 50 percent of today's workers are from the former owner, and some of the old processes and equipment are still used in the plant. An example for this is the operation of a separate, headcount-heavy maintenance team at L-I, while in L-PARENT the workers are typically responsible for maintaining their machines themselves, which has proved helpful to improve maintenance as well as productivity and output quality. Interviewees at L-I viewed these *inherited* processes as an important factor for the current productivity and efficiency problems in the plant. Another legacy problem is the location of the plant in Sonepat. The distance to the next port makes export uneconomical, and the poor local and regional infrastructure impedes trade even within the country. The plant building is an old, small setup, which forces the manufacturing team to operate inefficient processes. The interviewees at L-I argued that a modern plant – such as the one of L-C in China – would offer higher efficiency in manufacturing. In terms of R&D, L-I inherited an electronics R&D center from a former acquisition of L-PARENT. This center used to provide offshore services to the US market. After its integration into L-I, the center remained isolated from the manufacturing plant of L-I. This was mainly owed to the lack of overlap in products and technologies. This lack of integration has prevented synergies between the two units of L-I, which might explain why process improvements and technological upgrading in L-I lagged behind the developments in L-C in China, where R&D and manufacturing were closely aligned and intertwined. The legacy of L-I was of course not

entirely negative. In particular during the start-up phase, the established team, location, and supplier and sales network has facilitated the market entry of L-PARENT in India, and some (although few) of these advantages still exist today (e.g. few legacy suppliers).

The other Indian subsidiary (AM-I) also has a legacy in the host environment. The national organization of A-PARENT in India has operated independently from the German HQ over many decades. AM-I was tightly integrated with other subsidiaries of A-PARENT in India. It was consolidated under the umbrella of the national organization of the MNE as one of its minor businesses. Until the re-organization of A-PARENT in the mid-2000s, AM-I has not received much attention from both the global HQ and the national organization. The local character of the *old* national organization of A-PARENT can still be detected today in the manufacturing processes, labor force, and union relations of AM-I. The national organization has operated over several decades as a very profitable quasi-monopolist in India. This explains why has afforded above average wages in its plants. AM-I in Bangalore has inherited these high wages, which are significantly above the wages of its domestic competitors. The strong unions at AM-I – another legacy of the national organization – have also successfully resisted productivity increases in the plant. These factors have contributed to AM-I's lack of competitiveness in the Indian market. Under the leadership of the old national organization, AM-I has acted more or less independently from the rest of the MNE. Consequently, it has developed a set of products incompatible with the MNE's standards in terms of performance and process parameters. Because AM-I has been focused on the Indian market, compatibility with the MNE was not required. This lack of compatibility has repeatedly hindered the transfer of product lines from the MNE to AM-I – for example in the case of a designated line transfer from Brazil in 2004. But despite these disadvantages related to the legacy of AM-I, interviewees in the HQ as well as in the subsidiary did not claim that the legacy has determined the sluggish evolution of the subsidiary, and argued that other endogenous and external factors might have played a more important role.

These examples seem to suggest that a subsidiary's legacy in the domestic environment might have a predominantly negative impact on subsidiary evolution. This view is further supported by the fact that the *greenfield* investment in India (AC-I) has quickly developed into an MNE-internal role model. However, two successful cases in China (L-C, AM-C) provide interesting counterevidence. While both have also started with a domestic legacy, no significant negative effects could be observed in these cases. Like its Indian counterpart L-I, L-C in Foshan was established as a joint venture (JV) with a domestic company. When the JV was terminated after only one year, more than 100 workers and managers were taken over by L-C and the

operations in Foshan continued under L-C leadership. L-C is today regarded as a success story in its MNE. No evidence was found that inefficient legacy processes had survived over the years in the plant. On the contrary, L-C has succeeded to maintain the best of both worlds. Some managers of the old partner have developed into core pillars of the subsidiary's success story. The employees of the former partner brought with them a regional network to customers, officials, and suppliers. While most supplier relations have actually been terminated in the years following the separation from the former partner, relations to other regional stakeholders proved very useful for the subsidiary. Also the inherited location in Foshan proved very favorable for the operation of L-C's operations. In contrast to the case of L-I in India, a new plant was set up for L-C. A HQ manager in L-PARENT reported:

> *This [L-C] is a new plant. This facilitates the implementation of new processes. It is more difficult to implement changes to processes and habits in an established plant.* (Manager Quality P, HQ-L, trans.[13])

Along similar lines, an expatriate engineer at L-I points out:

> *Foshan [L-C] is an entirely new plant. In a greenfield project the performance is always better than in an old plant. The old structure causes extra work. There is more time and effort required for transportation, handling, etc.* (Project Manager Technical, L-I, trans.)

A similar evolution took place in the case of AM-C. The subsidiary was established as a *brownfield* investment based on an experienced workforce and facilities of a former licensee partner. Also here the upgrading to global standards of the MNE was successful, and after a short transition period AM-C had absorbed the latest technologies of the MNE and was eager to compete in the MNE network for mandates and resources. The establishment of a new plant and the transfer of sophisticated equipment right in the beginning have facilitated this strong development. In contrast to the experience of its counterpart AM-I in India, the start-up of AM-C marked a radical break with the domestic legacy of the plant. Most equipment, processes, and product lines were updated with the help of A-PARENT. Potentially negative influences of the plant's legacy were therefore minimized. At the same time, some positive influences of the legacy could be observed (e.g. strong relations to regional authorities and suppliers). However, the interviewees emphasized that this legacy has only been of minor importance for the evolution of the subsidiary, as most external partners had changed soon after the separation from the Chinese partner.

[13] All German language quotes were translated by the author. Original language quotes are listed in Appendix B. All translated quotes in this dissertation are highlighted by the term 'trans.' in brackets after the quote.

The evolution of the *greenfield* venture AC-C in Foshan resembles the evolution of its *brownfield* sister subsidiary AM-C in Changsha. Both subsidiaries earned a strong track record in their HQs right from the start and attracted new operations and responsibilities. This provides further support for the observation that pointing at domestic legacy of a subsidiary alone might fall short of explaining the different evolution paths observed in the cases.

In sum, this discussion demonstrates that path-dependent mechanisms related to a subsidiary's legacy can slow down a subsidiary's evolution. The discussion further suggest that important measures for curbing such negative legacy include the commitment of the MNE HQ to align the subsidiary with its global standards, to break with old routines and processes, and to establish new plants and facilities. At the same time, the discussion demonstrates that a selective integration of valuable legacy (e.g. relations to regional stakeholder) can facilitate subsidiary evolution – especially in the early phase.

Besides these aspects related to a subsidiary's entry mode, the case studies revealed additional path-dependent mechanisms. This includes the observation that the decision to transfer certain equipment, product lines, and responsibilities to a subsidiary can have far-ranging consequences for the subsidiary's evolution over time, as it might induce additional transfers in the future. The case studies provide evidence in particular for a path-dependent link between manufacturing and R&D mandates. With the transfer of new manufacturing lines to a particular subsidiary, the need for engineering and product development capacity in this subsidiary has often increased. With the upgrading of AM-C into the lead manufacturing plant for certain platforms, for example, the global R&D team of A-PARENT decided to transfer also their platform development activities to AM-C in order to ensure effective interaction between manufacturing, process, and product development. Similarly, the gradual upgrading of L-C's manufacturing operations (in terms of value-add and geographic scope) has attracted additional process engineering and eventually also product development responsibilities. Also here, the rational of the HQ was to co-locate manufacturing and development in order to achieve synergies and efficiencies throughout the value chain.

Labor-related configurations

The case studies provide evidence for how labor-related configurations and relations on the subsidiary level can pose structural (dis-)advantages to the evolution of a subsidiary's operations. This is particularly true in the context of labor productivity, which is an important determinant of a subsidiary's competitiveness in the MNE-internal and –external network and therefore also of its propensity to upgrade its operations over time.

In particular the subsidiaries in India struggled with improving productivity in their plants. In L-I and AM-I, as in most large Indian firms, productivity is negotiated between management and unions, and the actual output often lies significantly below capacity. Productivity improvement in these subsidiaries was therefore not (only) a matter of technical optimization, but also of negotiation with the unions. In particular AM-I suffered from very low productivity, at least until a new agreement in 2009 brought some improvement. Low productivity has hampered the competitive position of AM-I and, to a lesser extent, L-I in their MNE and has therefore impeded the upgrading of their geographic scope by capturing export mandates. It has also made the localization of certain product lines unattractive compared to imports, and has therefore slowed down the evolution of the subsidiaries' product and value-add scope. The outsourcing of several value-add steps to third-party firms by both subsidiaries was also closely related to these productivity issues.

While national labor laws establish a general framework for labor relations in a particular host country, the case studies demonstrate that the actual labor relations on the subsidiary level can differ significantly within the country. At AM-I in Bangalore, the unions bargained hard for productivity and wages. The negotiation power of the unions was an important driver behind the outsourcing of manufacturing activities of the subsidiary between 2002 an 2005. It has therefore contributed significantly to reduce the value-add scope of AM-I. Conflicts with the unions eventually escalated into a full-blown strike in 2010. In the course of the strike, productivity levels of the plant have improved. But the strike has further deteriorated HQ-subsidiary relations (even before the HQ was not enthusiastic about investing in AM-I).

A similar mechanism was observed in another plant of A-PARENT in Central India (AM-J in Jaipur). A long strike in this subsidiary in 2006 has deteriorated HQ-subsidiary relations. Interviewees in the subsidiary and the HQ reported that it took several years to recover trusted relations, and that investment in AM-J still triggers heated discussions in the HQ.

In contrast to these experiences, L-I has maintained harmonious labor relations. The unions were satisfied with the investment and improvement of working conditions L-PARENT had brought to the plant. Comparatively high wages and training efforts contributed to maintain good labor relations. At no point the subsidiary's strategy had to be altered due to union resistance. This could be seen as evidence for the cooperative spirit of L-I's management and various stakeholders. Critical observers, however, expressed the opinion that this might as well reflect the lack of ambition of L-I to improve productivity and competitiveness, which would have almost inevitably provoked conflict.

In the Chinese subsidiaries of both MNEs, no adverse effect of labor relations and union power on subsidiary evolution could be observed. On the contrary, the unions offered sufficient flexibility (over- or part-time hours in line with fluctuating demand) and cooperated with subsidiary management in improving employee satisfaction and reducing attrition. In contrast to the experience in India, productivity of the Chinese subsidiaries was a technological rather than a negotiation challenge. A range of HR measures could be applied in the subsidiaries to generate pressure as well as incentives for workers to continuously improve productivity. Productivity *slack* as observed in India could therefore be minimized.

Subsidiary capabilities

The concept of capability-driven evolution is based on the assumption that the accumulation of capabilities in a subsidiary beyond existing mandates might attract additional mandates from the HQ and might therefore upgrade the subsidiary's role in the MNE. But also the reinforcement of a subsidiary's capabilities within existing mandates might drive its evolution by strengthening its MNE-internal track record and thereby encouraging the HQ to upgrade the subsidiary's operations (BIRKINSHAW and HOOD 1998).

L-C in Foshan is a good example for how the accumulation of capabilities can motivate the transfer of additional operations to a subsidiary. L-C has systematically engaged in an upgrading of the capabilities of its workers and staff. In cooperation with a vocational college in Foshan, it has established its own vocational training program – the first public-private partnership of this kind in the region. The vocational training was complemented by a sophisticated in-house training and competence management program. These initiatives were mainly a reaction to immediate requirements, but also to projected future requirements. The recent establishment of a new *mechatronics* class at the vocational college, for example, was motivated by the expectation of L-C managers that the gradual automation of machinery will require this expertise in the near future. Most training initiatives, however, were not intended to expand the subsidiary's mandate, but to enable it to fulfill the existing mandate.

With the help of these internal and external training efforts, L-C has accumulated a strong capability portfolio over time. This has generated confidence among HQ management and motivated the transfer of additional operations. The recent establishment of a machine building division in Foshan – one of only few of such units of the MNE worldwide – illustrates this mechanism. The investment was a direct consequence of successful efforts of L-C's engineering team to optimize its manufacturing operations. Also in the R&D function, L-C has initiated a dynamic upgrading of its capabilities. In 2008 alone, the number of

engineers doubled to more than hundred. The delegation of a new expatriate R&D head in 2005 reinforced further the capabilities of the local team. But also here, the reinforcement of capabilities was a response to new tasks assigned by the HQ, and only to a lesser degree the result of ambitions of subsidiary manager to venture in entirely new fields.

Also the two other Chinese subsidiaries (AC-C and AM-C) invested considerable effort in reinforcing their capabilities. The automotive safety unit of AC-C initiated a broad capability upgrading initiative in 2005 after the expansion of its operations had been decided by the MNE. But as in the case of L-C, this initiative has followed the designated strategy of the HQ (i.e. the expansion of operations) and not the other way around. When the new electronics unit was set up in Suzhou in 2005, it has initially struggled to meet the requirements of the booming domestic market and the ambitious targets of the HQ. The subsidiary responded with the establishment of an internal training academy in order to close capability gaps and to prepare its staff for designated product line transfers. The success of these initiatives has encouraged A-PARENT to transfer more and more operations to AC-C, and eventually to transfer full responsibility for the subsidiary's manufacturing operations to the AC-C management. Similarly, AM-C in Changsha faced ambitious expectations from the HQ. The speed of AM-C's evolution was so fast that, despite considerable internal training efforts, the subsidiary struggled to meet all new requirements. In particular in R&D, the HQ requested a faster upgrading of activities than the subsidiary was capable to manage at that time. In such a dynamic evolution, there was little room for AM-C to generate capabilities beyond existing requirements. But its ability to quickly develop the capabilities to meet the ambitious plans of the HQ has encouraged HQ managers to push even more operations to this subsidiary. This demonstrates how the reinforcement of existing mandates can function as a catalyst for upgrading a subsidiary's operations.

In contrast to the very rapid evolution of the two relatively young subsidiaries AC-C and AM-C in China, the longer history of the Indian subsidiaries might have induced a gradual accumulation of capabilities beyond existing mandates. But the case studies of L-I and AM-I largely disappoint this expectation. While both subsidiaries did of course engage in training efforts and upgraded their capabilities over time, the case studies suggest that these efforts were less ambitious and successful than the ones observed in China. Interviewees in the MNE HQs were missing efforts of their subsidiaries in India to enhance their overall capability profile. A R&D manager in the HQ of L-PARENT, for example, observed:

> *For technical problems they [L-I] always asked Germany for help. [...] They were focused on getting problems fixed, but not on developing the infrastructure to fix them alone. This would have required investment.* (Manager R&D EU, L-PARENT, trans.)

These observations suggest that also the Indian subsidiaries fell short to develop capabilities beyond their existing mandates and therefore to induce a capability-driven evolution path.

The accumulation of capabilities in the six subsidiaries was mediated by a range of factors. Many of these factors are related to the host environment. This includes the qualification of workers in the labor market, which will be discussed below in *chapter four*.

The accumulation of capabilities by the subsidiaries was also found to depend on their ability (and willingness) to recognize and absorb location-specific external capabilities. While the subsidiaries have largely failed to develop sophisticated (technical) capabilities beyond existing mandates, they have been able to absorb emerging-economy-specific capabilities in their host environment. This includes capabilities to design low-cost products and highly flexible processes to deal with volatile demand. While all subsidiaries were found to have accumulated such capabilities, the willingness and capacity to absorb them has differed between the subsidiaries. Among other reasons, this was related to the mindset of subsidiary management, prior knowledge of staff, and the autonomy granted by the HQ.[14] The absorption of location-specific capabilities has reinforced the subsidiaries' ability to compete in the domestic market and has influenced the MNEs' manufacturing and R&D strategies and geographic footprint decisions. In particular in recent years, both MNEs have attempted to use the localized capabilities of their subsidiaries to augment the MNE's competitive advantage. The absorption of location-specific capabilities has therefore played an important role for the observed evolution paths.[15]

The accumulation of capabilities by the subsidiaries was also found to depend on the stability of the subsidiaries' workforces. In particular the two Chinese subsidiaries AC-C and L-C suffered from high rates of attrition of 20 percent and more per year. This fluctuation has undermined a gradual accumulation of capabilities in the subsidiaries. Interviewees at L-C, for example, reported that the upgrading of their R&D capabilities had been set back several times when trained engineers had left for competitors, forcing L-C to recruit fresh graduates without practical know-how. Also AC-C has experienced attrition as a key barrier to a faster upgrading of its capability stock. In contrast, the subsidiaries in India did not experience attrition as a pressing problem for their efforts to enhance the capabilities of their staff.

[14] These aspects will be discussed in more detail in *chapter four*.
[15] *Chapter 3.5* will discuss the impact of localized capabilities on decisions in the MNE HQ in more detail.

The search for capability-driven evolution paths is of course a simplification of the complex reality in a MNE subsidiary. A closer look at the cases reveals different evolution drivers within each subsidiary. In the case of L-C, for example, the role of capability accumulation for its evolution over time has differed significantly between different technologies. In some technologies (e.g. fluorescent lamps), L-C has accumulated sophisticated capabilities internally, and also the domestic market has offered expertise. The strong capability stock of the subsidiary in these technologies has in turn attracted additional product lines and responsibilities from the HQ. In other technologies (e.g. ceramic lamps) L-C has accumulated only very rudimentary capabilities. But nevertheless the HQ decided to install manufacturing operations in these technologies in the subsidiary in order to minimize transaction costs associated with imports. This illustrates that different evolution drivers (capability-led or led by HQ-assignment) can coexist in a single subsidiary.

Subsidiary initiative

Instead of a HQ-driven up- or downgrading of a subsidiary's mandates (as conceptualized in the traditional Strategic Management paradigm), subsidiary evolution could also be the result of initiatives of the subsidiary itself. Such initiative can include proactive *lobbying* for new mandates in the HQ, autonomous operations of a subsidiary beyond the existing mandate, and – more indirectly – initiatives to achieve operational excellence in existing mandates and associated reputational gains in the MNE.

The first type of subsidiary initiative is the proactive *lobbying* of subsidiary managers for the transfer of new product lines, R&D responsibilities, or export mandates. A good example for this type of initiative is provided by L-C, whose management showed strong ambition to attract new operations. In the early phase, L-C was assigned a very narrow product portfolio. But after monitoring the domestic market for some years, subsidiary managers lobbied the HQ in Germany to transfer additional products to China (e.g. halogen-lamps). Over the years, more and more products were *pulled* to China. A recent example is the establishment of a LED assembly line. The technical site head of L-C had repeatedly toured the plants in Germany to appraise the advantages of his site (e.g. the experience of L-C's workers, the availability of space and infrastructure, and the support from regional authorities). These efforts eventually paid off, and new assembly lines were eventually transferred to L-C. The subsidiary now has a foot in the door of this important technology, which is critical for its long-term survival. However, subsidiary managers were careful not to overstate the relevance of these lobbying efforts, and argued that key decisions affecting L-C's operations have in fact

been taken by the HQ in line with the global strategy. The lobbying efforts might therefore have accelerated – but not fundamentally altered – the evolution of the subsidiary.

The operations of AC-C and AM-C were closely monitored and supported by the global HQ, and the capacities and capabilities of the two subsidiaries were fully occupied with mandates assigned by the HQ. This left little room for a proactively lobbying for additional mandates. Nevertheless the case studies provide some evidence for lobbying efforts. In AC-C, for example, the (expatriate) management of the safety products unit proactively took the decision in 2005 to expand the value-add in manufacturing by switching from assembly to complex manufacturing. Once the HQ had agreed to this strategy, the subsidiary initiated a broad capability upgrading initiative to meet the new requirements.

Similarly, the management of AM-C has recently introduced ambitious targets to achieve market leadership. The new targets were accompanied by a request to the HQ for the transfer of additional product lines and resources to the subsidiary. The HQ supported this request, which was in line with its overall priorities.

Also AC-I in India has lobbied successfully for a localization of products required in India to its plant. This included complex products which were before imported from China.

In the mid-2000s, also L-I in India has proactively *pulled* new products from the HQ. Facing strong demand and local capacity shortages, the subsidiary has lobbied successfully for the establishment of a second plant with new product lines (including automotive lighting). HQ managers confirmed the proactive stance of L-I at the time and reported that it might have even been a bit too ambitious regarding the prospects of the new site. In recent years, however, the management of L-I has changed its strategy and has increasingly preferred the *buy* over the *make* option. This was mainly related to its uncompetitive cost position. Consequently, lobbying efforts of L-I to expand the product or value-add scope have reduced drastically in recent years.

The case studies also provide evidence for successful lobbying for R&D mandates. AC-C was particularly ambitious to develop new products. Due to the pressure from its domestic customers to develop products faster and cheaper, AC-C has repeatedly requested responsibilities for product development from the central research of A-PARENT. At least partially owed to these efforts, the R&D operations of AC-C were gradually expanded. Also AM-I has lobbied for additional R&D mandates. While AM-I has deliberately downgraded its value-add in manufacturing, the local R&D team has attempted to *pull* more knowledge-intensive activities to the site. This included requests for the permission to develop low-cost variations of existing products for the Indian market. In the case of L-I, only very limited

lobbying for additional R&D mandates was observed. Interviewees in the HQ of L-PARENT expressed the opinion that L-I has simply not been interested in increasing its value-add in R&D. Interviews with the R&D center in Delhi confirm that L-I's engineers were comfortable in the niche of electronic ballasts and did not try to expand their activities to the core product of the MNE – the lamp. Engineers in L-I's manufacturing plant showed more interest to get involved in lamp development. Until today, however, they have not attempted to lobby the HQ to provide resources and experienced manpower in order to perform such activities.

A second type of initiative – *autonomous action* – refers to proactive activities of a subsidiary beyond its existing mandate. This is particularly relevant for product development, where subsidiaries might start development activities without formal mandate. By doing so, they might proactively expand the scope of their R&D operations and might in turn induce an expansion of the mandate by the HQ.

A good example for autonomous action is provided by the case of AM-I. Before 2006, the subsidiary has never been active in electronics development. But to meet a specific requirement of a domestic customer, AM-I's engineers proactively developed a new product together with the customer. This *ad-hoc* development process has ignored most internal procedures of A-PARENT, which was involved only loosely in the project. By 2010, the project was completed successfully, and the innovative technology of the product was also exported to some other markets. However, while the success of the project has been acknowledged in the HQ, it has not yet translated into an expansion of AM-I's R&D mandate. On the contrary, the subsidiary has recently lost an important R&D mandate to China. But nevertheless, with this autonomous project AM-I has attracted attention for its capabilities in the HQ, which might eventually translate into additional R&D responsibilities.

A similar example was observed in the case of L-I. In the niche of electronic ballast, L-I has recently proactively developed a new product. Only once the product was finalized, it was presented to internal customers in the MNE. But as in the case of AC-I, this initiative has not yet translated into an expansion of L-I's formal R&D mandate.

Another example for autonomous action is the development of a low-cost airbag by AC-C. While not intentionally concealed by AC-C's engineers, the HQ did not take notice of the project, and AC-C's engineers operated largely independently throughout the project. The final product was well received by the MNE, and is now applied also in other countries as a low-cost extension of the product portfolio of A-PARENT. While the project was not yet

followed by an expansion of AC-C's R&D scope, it has clearly enhanced the track record of the subsidiary in the MNE and might therefore induce future projects.

The third and last type of subsidiary initiative observed in the case studies is the improvement of efficiency and quality of existing operations. While taken alone this does not constitute a role change according to WHITE and POYNTER (1984), it is closely related to subsidiary evolution in the sense that a strong track record might attract new mandates from the HQ (BIRKINSHAW and HOOD 1998).

A successful example for this mechanism is provided by the case of AC-C. In only five years of operation, this subsidiary has developed unique, efficient processes with high quality output. Led by a dynamic expatriate technical head, the standardized processes designed in the HQ were gradually adjusted to Chinese conditions (e.g. by reducing the degree of automation). These initiatives were not always appreciated by the HQ. But over time, HQ management recognized the unique expertise of AC-C's engineers, and increasingly attempted to use it for process development for global product launches – a clear expansion of AC-C's value-add scope. Another initiative – an internal and external benchmarking exercise – has helped AC-C to identify cost savings in its processes (e.g. by adjusting KPIs). As a result of these initiatives, the subsidiary has gained a strong track record in the HQ and has attracted additional product and service mandates (e.g. process development).

L-C has also engaged in initiatives to improve its manufacturing operations. A team of engineers has adjusted and improved all major production lines. Lines transferred from the US were soon operated at higher efficiency than in the originating plant. Among other measures, this was achieved by adopting best practices from the MNE-internal network with a local twist. These improvement efforts helped L-C to achieve manufacturing excellence and to improve its MNE-internal competitiveness and track record, which has in turn attracted additional product lines transfers from the HQ to its site.

The two Indian subsidiaries L-I and AM-I did not demonstrate similar ambitions to achieve manufacturing excellence. Instead of focusing entirely on improving their in-house operations, the two subsidiaries have focused considerable attention on improving their competitive situation by outsourcing to external partners. In both subsidiaries, this deliberate downgrading of value-add in manufacturing was driven by the subsidiary management, while the two MNE HQs did not always agree with this strategy. AM-I decided to outsource significant parts of its manufacturing operations in the early 2000s as a consequence of reduced sales volumes and a lack of cost competitiveness. The subsidiary management at the

time decided that outsourcing is required to turn around the subsidiary. Since recently, AM-I has dedicated more attention to improving its manufacturing operations (e.g. by implementing the MNE's production system). With these efforts, the engineers hope to recover parts of the outsourced value-add in the near future.

L-I has not engaged in similar levels of outsourcing in the manufacturing function. But it has also increasingly looked for third-party partners as a means to enhance its competitiveness. In the case of HID lighting, for example, L-I and the BU leadership in Germany have recently terminated plans for in-house manufacturing in India and decided to continue with imports from Germany and final assembly performed by an external partner in India.[16] Underlying this decision was the poor cost position of L-I in the domestic market as well as the lack of investment of L-I to upgrade the product and value-add scope of its operations.

These findings provoke the question why some subsidiaries demonstrated higher levels of initiative than others. HQ managers in both MNEs would have preferred to see more initiative of the Indian subsidiaries, while they were largely satisfied with the level of initiative of the Chinese counterparts. Among other factors, the interviewees in the HQs stressed the different *working cultures* in China and India as explanation for the different levels of initiative (and therefore also the different evolution paths observed). The sample of six cases is too small to draw conclusions about the working cultures in these locations. Furthermore, it is very difficult to separate the influence of expatriate managers from the actual *Chinese* or *Indian* working culture. A HQ manager of L-PARENT illustrates this point:

> *I would not say that the success of this plant was owed to Chinese culture. It was driven by German managers with experience in other parts of the world. They were driving it systematically with high deployment.* (Vice President C, L-PARENT, trans.)

Due to these methodological limitations, an assessment of the contribution of national working cultures to the up- or downgrading of particular subsidiaries cannot be provided here. Yet regardless of the validity of observations related to working culture, the interviews clearly suggest that the mere perception of (some) HQ managers that their subsidiaries in India were not always *trying hard enough* to improve their capabilities and operations has already had an adverse impact on the evolution of these subsidiaries, in so far as this perception discouraged HQ managers to engage in upgrading activities there.[17]

[16] HID stands for high-intensity discharge lamps – a relatively sophisticated lighting technology for L-I at the time.
[17] The perception and actions of HQ managers will be discussed in more detail in *chapter 3.5*.

Table 3 provides a pragmatic summary of the findings of this section:

Subsidiary	Location	Legacy	Labor relations	Capabilities	Initiative
L-I	National Capital Region (Delhi/Sonepat)				
AM-I	Karnataka (Bangalore)				
AC-I	Karnataka (Bangalore)				
L-C	Pearl River Delta (Foshan)				
AM-C	Hunan Province (Changsha)				
AC-C	Yangtze River Delta (Suzhou)				

Table 3: Impact of subsidiary-endogenous configurations on subsidiary evolution[18]

Source: Table provided by author.

3.5 Vertical relations with the HQ

In line with the conceptual framework of subsidiary evolution laid out above, the role of the HQ is analyzed on three different geographic levels: global, macro-regional (e.g. Asia-Pacific), and national. On each level, the analysis distinguishes between three impact mechanisms: firstly, the HQ might proactively assign new mandates to a subsidiary and/or support the upgrading of its capabilities. Secondly, the HQ might encourage or tolerate subsidiary-level upgrading initiatives. And thirdly, resistance of HQ management might impede subsidiary upgrading. Furthermore, the analysis makes an attempt to disentangle the corporate HQ of the MNE and the HQs of the global divisions or business units (BU).

3.5.1 The global HQ and global lead plants

3.5.1.1 Proactive HQ support

In the traditional Strategic Management paradigm, MNE subsidiaries change their roles over time as a result of the assignment of new roles and responsibilities through their HQ in line with the global strategy of the MNE (BIRKINSHAW and HOOD 1998, RUGMAN et al. 2011). The case studies provide strong evidence for such a HQ-driven evolution. At the same

[18] Qualitative assessment based on case study analysis. The table indicates the *direction of impact* (not the exact magnitude) of selected subsidiary-endogenous configurations on the evolution of a particular subsidiary. "Very supportive", for example, indicates that a configuration has strongly supported the upgrading of a subsidiary's role, while "strongly impeding" indicates that a configuration has impeded such an upgrading or has even caused a relative downgrading of a subsidiary's role.

time, however, the level of commitment of HQ managers to drive the evolution of the researched subsidiaries differed considerable between subsidiaries in the two host countries.

In A-PARENT, the two subsidiaries in China were given significantly more HQ attention and support than their counterparts in India. While AM-C in Changsha was upgraded into a lead plant for Asia-Pacific, AM-I in Bangalore received less attention and maintained rather low-scale operations. The dynamic evolution of AM-C was closely related to HQ strategy and support. Key investments in the manufacturing and R&D operations of AM-C were driven by the ambition of A-PARENT to succeed in China. However, it is fair to say that AM-C's own ambition to achieve market leadership in China and its efforts to attract HQ investment have supported this development. The upgrading of AM-C's R&D operations was also driven by ambitious plans in the HQ, for example by the top-management decision to perform platform development activities in AM-C by the year 2010. In order to meet its ambitious targets in China, the global R&D team initiated a massive capability upgrading program at AM-C and supported the establishment of a separate engineering center. In 2010, the HQ decided to transfer the Asia-wide responsibility for R&D to AM-C – another milestone in its evolution. Interviews in AM-C confirmed the HQ-driven character of this evolution and admitted that the local leadership team would have preferred a more gradual evolution at the time.

The upgrading AC-C in Suzhou was also heavily driven by the ambitions in the HQ to succeed in China. The ramp-up of AC-C's manufacturing operations has been planned and closely monitored by HQ managers. Most processes and KPIs were imported from the German lead plants to ensure that global MNE standards will be maintained right from the beginning. Key footprint decisions affecting AC-C, such as the localization of Park Pilot product lines in 2008, were mainly the result of the HQ's strategy in China and globally.

In contrast to this commitment of A-PARENT to succeed in China, AM-I in India has developed more independently. Key events, such as the outsourcing of parts of its manufacturing operations in the early 2000s, have been driven by subsidiary managers and not by the global HQ. Only after the recent re-organization of A-PARENT, the HQ has dedicated more attention and investment to AM-I, for example by introducing the global production system of the MNE to AM-I. Also in terms of R&D, the HQ did not dedicate considerable resources and commitment to upgrade AM-I's operations. The contributions of AM-I's R&D team to global platform projects and India-specific low-cost initiatives were appreciated by the HQ. But nevertheless the HQ decided in 2008 to concentrate all platform development for emerging economies in China and to invest in capacities there. Since then,

India has remained focused on application work for the domestic market, and for the foreseeable future no major investment in AM-I's R&D capacities is planned.

Also in the case of L-PARENT, the commitment to upgrade its subsidiaries differed significantly in China and in India, and the Chinese subsidiaries have received significantly more attention. In the case of L-C, almost all key decisions to expand the manufacturing scope were driven by the global HQ. This included key footprint decisions such as the shift of production lines from the US sister to China in 2003 or the expansion of L-C's manufacturing capacity to reduce its dependency on external partners in 2009. The recent establishment of a machine building division at L-C was also initiated by the HQ. The technical head of L-C described the leading role of the global BU HQ as follows:

> *They [the global BU] will not ask whether or not I want to do it. If the BU thinks it is economical, then we have to do it.* (Vice President Technical, L-C, trans.)

The evolution of L-C's geographic scope was also driven by the ambitions of the global BUs. The transfer of product lines from other plants to L-C, for example, has followed mainly global footprint decisions. While L-C had in fact tried repeatedly to draw HQ attention to its idle manufacturing capacities in an attempt to attract such transfers, the footprint decisions were mainly based on market and capacity considerations on the global level. Likewise, the evolution of L-C's R&D scope was largely driven by HQ strategy. When the HQ developed ambitious plans for establish R&D activities in Foshan, the subsidiary management at the time was not enthusiastic. Also the recent decision to upgrade L-C into the R&D center for Asia-Pacific was mainly driven by the global HQ. L-C had not requested this responsibility – it was rather awarded to it in the context of the MNE-wide strategic *shift to Asia*.

The commitment of L-PARENT to upgrade its Indian subsidiary L-I was only moderate when compared to the commitment demonstrated to upgrade L-C in China. While the HQ has made efforts in the early phase of L-I in the 1990s to upgrade the plant to minimum standards of the MNE, the interest in L-I has soon faded. In fact, L-I has received only moderate HQ attention for most of its history and has developed rather independently. One of the key milestones in its evolution, the decision to build a second plant nearby and to transfer additional product lines in 2005, was the result of an initiative of L-I's management, and not of HQ commitment to upgrade the subsidiary. In R&D, L-I did not evolve its activities beyond rudimentary adjustments of products for the domestic market. Among other reasons, this is a result of the lack of support L-I has received from the global HQ. A sales manager at L-I argued:

> *[L-PARENT] has invested much more in China. [...] They have not looked at alternative low-cost countries. I think [L-I] was neglected.* (Asst. Vice President Sales, L-I)

A HQ manager of L-PARENT confirmed this assessment:

> *China has received high levels of attention from Europe. Much more than India. The influence from [L-PARENT] was therefore very strong, and bold changes were implemented quickly.* (Vice President P, L-PARENT, trans.)

A particularly important mechanism of HQ support observed in the case studies was the delegation of expatriate managers (expats). The number of expats in the researched subsidiaries differed significantly. More expats were delegated to subsidiaries in China, and more expats were delegated in the earlier phase of the subsidiaries' history than in mature phases. In both MNEs, the Chinese subsidiaries have been under (German) expatriate management for most of their history. Only recently, L-C and AC-C hired Chinese managers as commercial heads, while manufacturing and R&D remains in the hands of expats. The two MNEs sent numerous expats in different functions for two- to four-year terms to China. With over 50 expats, AC-C today employs the largest expat community of the subsidiaries.

With the exception of the ramp-up phase, the two older subsidiaries in India were run almost entirely by domestic managers, most of which did not have prior experience in the MNE and/or outside of India. In particular in the R&D function, hardly any expatriate engineer was delegated to these subsidiaries. On an *ad-hoc* basis, experts from the MNE visited the Indian plants to support specific projects such as the ramp-up of new lines. What was missing, however, was an expat community to support the long-term evolution of the subsidiary. Only the latest investment in India – AC-I – is run predominantly by expat managers. This is mainly owed to the fact that it is still in the ramp-up phase. But given the sensitive technology in this subsidiary, is it highly likely that it will host a number of expatriates also in the future.

Subsidiary	Location	Number of expats (2010)	Share of total headcount	Roles of expatriate managers
L-I	NCR (Delhi/Sonepat)	1	0.1%	Technical advisor
AM-I	Karnataka (Bangalore)	2	0.2%	Commercial and marketing heads
AC-I	Karnataka (Bangalore)	2	2%	Commercial and manufacturing heads
L-C	Pearl River Delta (Foshan)	10	0.5%	Manufacturing and R&D heads, other key positions
AM-C	Hunan Province (Changsha)	25	1%	General Manager , R&D head, other key positions
AC-C	Yangtze River Delta (Suzhou)	50	1.5%	Manufacturing and R&D heads, other key positions

Table 4: Expatriate staff in the selected subsidiaries

Source: Table provided by author.

The case studies suggest that this unbalanced delegation of expats to the subsidiaries has played an important role for the different evolution paths of subsidiaries in China and India.

Firstly, expats were found to foster subsidiary evolution through the transfer of know-how about products and processes. In both MNEs, the main rationale for delegating expats was to foster knowledge transfer to all relevant technical and organizational areas of a subsidiary. This included the introduction of best practices in maintenance, process rationalization, and resource planning. Also the transfer of new production lines was supported by expats. When a new product family was transferred to AC-C in 2008, for example, the new lines were operated by German technicians and project managers for the initial years. These expats remained in China until local staff was ready to take over. This costly procedure has helped AC-C to quickly reach the quality and efficiency standards of the MNE. Similarly, the manufacturing operations in L-C and AM-C were managed by expats for most of their history. As in the case of AC-C, the technical competence of these expats has played a crucial role in mastering the dynamic evolution of the subsidiaries. Also in R&D, the two MNEs delegated numerous engineers to their Chinese subsidiaries. Especially after 2005, when both MNEs decided to decentralize parts of their knowledge generation, an expat-led upgrading of R&D capacities was initiated in the three Chinese subsidiaries. The interviews suggest that the technical expertise of these expat engineers has contributed substantially to build up product development capabilities and to expand the R&D scope of the subsidiaries.

The two older Indian subsidiaries (L-I and AM-I) have not benefited from similar levels of knowledge transfer through expats. The transfer of new production lines and equipment was often accompanied by the temporary employment of experts from Germany or other developed countries. But these experts were not delegated to India for several years as observed in China, but rather left the subsidiary after the initial transfer project. While AM-I remained isolated from its MNE for large parts of its history, L-PARENT made more efforts to integrate L-I into its global expert network. The technical (expatriate) head of L-C in China, for example, took over the technical leadership also for the Indian subsidiary several years ago and has since then paid monthly visits to L-I to foster knowledge exchange and manufacturing excellence. However, both subsidiary and HQ managers reported that this effort alone was not sufficient to compensate for the disadvantage of L-I vis-à-vis its Chinese counterpart L-C with its community of 20+ expatriate managers and engineers.

While the manufacturing area of the two Indian subsidiaries has at least seen at least some expats, the R&D area was almost entirely run by local engineers. This was mainly owed to the fact that (at least until recently) both MNEs did not expect their Indian subsidiaries to play a

prominent role in their global R&D network. And for serving the Indian market, the capabilities of the subsidiaries were deemed sufficient. A R&D manager of A-PARENT provided another interesting rational: the presence of expat engineers with their high-tech and high-cost mindset might put the very advantage of the local team in India at risk – their low-cost mindset. In fact, when AM-I was asked to contribute to a new product platform for the emerging economies in 2007, the responsible R&D manager in the HQ vetoed the delegation of expats in order not to derail unconventional solutions to be created in India.

Secondly, expats were found to foster the evolution of the subsidiaries through their technical and managerial experience from prior assignments in the MNE. An expatriate manager in the electronics unit of AC-C, for example, had prior experience from setting up a subsidiary in Eastern Europe. This experience has been greatly beneficial to avoid mistakes during the ramp-up of AC-C. As a matter fact, it had been one of the main reasons why this individual was selected for the position in AC-C. Also in the case of AM-C, the dynamic upgrading of the subsidiary was supported by expats with prior experience in setting up other subsidiaries. Similar observations were made in the case of L-C. A HQ manager of L-PARENT reported:

> *The expat community in Foshan was substantial. There were always German managers with experience from around the world. […] And therefore the plant has developed successfully.* (Vice President C, L-PARENT, trans.)

Also in R&D, the prior experience of expat engineers in the MNE (and in particular in the HQ in Germany) was found to have facilitated successful upgrading in both MNEs in China.
In contrast, the subsidiaries in India did not benefit from the prior experience of expat managers in the MNE. The leaders of L-I and AM-I were in most cases experts for the Indian market. Both subsidiaries have therefore maintained a strong *Indian character* in their operations and working culture. While in the case of the Chinese subsidiaries the domestic character has been harmonized with the global MNE (with the help of strong expat communities), such a harmonization has not taken place to a similar extent in India. Only in recent years the two Indian subsidiaries have received more support from their HQs. The new plant of L-I, for example, was managed by an experienced expat manager. And in AM-I, a new expat marketing manager is now establishing global processes and standards. But for most parts of the history of these subsidiaries, the absence of experienced expats was a clear disadvantage vis-à-vis the sister subsidiaries in China, where the experience of expats has been combined successfully with the expertise of domestic managers.

Finally, expatriate managers were found to foster the evolution of the subsidiaries by bringing with them established social networks in the MNE. The case studies reveal that such networks of expats can strengthen the relation of the subsidiary to the HQ and thereby the subsidiary's ability to secure resources and mandates. Expats with strong networks were found to be more aware of knowledge and technology sources in the MNE, how to structure project proposals to the HQ, or how to overcome barriers to the transfer of knowledge. This is especially important for subsidiaries in peripheral locations which might face high barriers to knowledge transfer. A manager of AC-C reported:

> *I have worked as department head in the Lead Plant. So I can call colleagues and friends and ask them for help. [...] Because even if the president gives me a mandate, they could find 5000 reasons not to help me.* (Vice President MFG S, AC-C, trans.)

Besides the delegation of expatriates, the two HQs have supported the evolution of their subsidiaries more indirectly through a systematic upgrading of the subsidiaries' capabilities. During the preparations for the new electronics unit at AC-C, for example, the new Chinese engineers and workers received training in Germany. A manufacturing manager reported:

> *All engineers from the first batch were sent to the HQ, at least 100 people from all departments. We also brought some workers to train them on the manufacturing lines set up in the HQ.* (Vice President MFG E, AC-C, trans.)

This systematic upgrading of the subsidiary's capabilities was supported by a dedicated department in A-PARENT with experience from multiple internationalization projects. The same manufacturing manager described the benefits of this procedure:

> *The department supported us with guidelines. We learned from mistakes and best practices of other projects, and we have further improved the best practices. This was a key success factor to localize our products.* (Vice President MFG E, AC-C, trans.)

Also during and after the ramp-up of AM-C in Changsha, the HQ has sent technical staff of the subsidiary to Germany for training in manufacturing processes and equipment. Over the years, at least 150 to 200 people were sent to Germany. Similarly, when the new R&D mandate for Asia-Pacific was assigned to AM-C, several of its engineers were sent to Germany for training in the global R&D center. This MNE-wide alignment of capabilities has gained particular relevance since global OEM clients of the MNE were increasingly expecting identical products in markets such as Mexico, Brazil, and China. The HQ-driven upgrading of subsidiary capabilities has clearly facilitated the dynamic evolution of AM-C.

Also in the case of AC-I in India, the rapid ramp-up of operations was supported by sending most technical staff to Germany for training on the new production lines. In 2008, more than

45 employees had spent several months in Germany. Only once the HQ was confident that the know-how transfer had been successful, the production lines were transferred to India.

In the case of L-C, training of technical subsidiary staff in Germany has been less common than in the case of A-PARENT. The successful upgrading of capabilities in L-C was mostly the result of subsidiary-level training efforts as well as capability transfer through expats. However, before being promoted to a management positions in L-C, Chinese managers are requested to spend at least a two-year *international leadership program* in Germany.

In L-I, some engineers were delegated to Germany for training right after the acquisition in the late 1990s. And in the past decade, five to ten people per year received training in Germany, for example when production lines had to be transferred. Since very recently, also candidates for management positions are sent L-PARENT's training academy in Germany. In the R&D area, the US sister subsidiary has invited several of L-I's engineers to the US to receive technical training on electronic ballasts. The benefit of this exchange is best illustrated by the case of the first independent product development at L-I: after several months in the US R&D center, the Lead Engineer had just returned to India when he successfully combined the newly acquired technical knowledge with an existing Indian prototype.

Also in the case of AM-I, subsidiary staff has benefited from training in the HQ. However, the absolute numbers were small compared to the investment made by the MNEs to upgrade staff of the Chinese subsidiaries. In particular due to AM-I's comprehensive outsourcing of value-add steps in manufacturing, the HQ saw little need to train manufacturing staff of the subsidiary. In the R&D area, several of AM-I's engineers were invited to Germany to work on joint projects. The visits have contributed to reinforce the development capabilities of AM-I. But due to the strategic focus of the MNE on China, this has not yet translated into an upgrading of AM-I's R&D scope.

3.5.1.2 Mediating conditions for proactive HQ support

In order to explain the asymmetrical HQ support to subsidiaries in China and India, several conditions in HQ-subsidiary relations will be looked at in more detail: the MNE-internal contributions of a subsidiary, the MNE's organizational structure, attitudes and social relations in HQ-subsidiary relations, and the relevance of the subsidiary's host market for the MNE.

MNE-internal contribution

The contributions of a subsidiary to the MNE network determine its MNE-internal weight.

Such contributions can include cost-efficient components and/or products, access to suppliers, and/or access to location-bound knowledge. A subsidiary's contribution of components and/or products to the MNE reinforces its relevance for HQ managers, which might in turn mobilize additional resources and support. However, substantial export activity could only be observed in few cases. While the internationalization of L-PARENT has followed a mix of market- and efficiency-seeking motives, A-PARENT has followed a clear market-seeking strategy and has used its dispersed operations mainly to serve domestic markets. Among other factors, the different strategies reflect the characteristics of the industries. In the commoditized mass market of the lighting industry, the three global market leaders (L-PARENT being one of them) follow similar efficiency-seeking strategies with several low-cost manufacturing hubs around the globe. Certain product families are produced almost entirely in low-cost locations in order to benefit from scale economies and favorable factor conditions. Only in the higher value-add project business, geographic proximity to customers is important. In line with its global strategy, L-PARENT has developed L-C in China into one of its low-cost export hubs for commodity products. Although L-C's export share has been falling in recent years, it still exports around 40 percent of its output to the world market. For certain product families, it covers 100 percent of the MNE's global output. L-I in India has so far failed to secure export mandates. This difference in export orientation partially explains the asymmetrical support the two subsidiaries have received from their HQ. The manufacturing head of L-I argued:

> *The China plant is a hub for exports. [...] They have got a lot of equipment from Germany which was earlier used there. [...] When this equipment gets relocated, along with expats, the expertise also comes. They definitely had this advantage.* (Vice President MFG, L-I)

A manager of L-PARENT confirms the observation that the export orientation of a subsidiary and the level of support it receives from the HQ might be closely related:

> *Due to considerable efforts invested [by L-PARENT], China has developed successfully. So they can be used as global suppliers. In India, many things go wrong, and their output can only be used for the domestic market. In turn they received even less attention and lag even further behind.* (Vice President C, L-PARENT, trans.)

The requirement to maintain highest quality standards in L-C has encouraged L-PARENT to invest not only in manufacturing equipment and processes, but also in related areas such as quality management, engineering capabilities, or training capacities. Over time, this support from the HQ has therefore upgraded the capability level of the entire plant.

In contrast to the lighting industry, manufacturing operations in the automotive supply industry of A-PARENT are often located in close proximity to the OEM customers. Among

other reasons, this is related to just-in-time manufacturing schemes to minimize transportation and storage costs, as well as to the critical role of (interactive) quality management across the value chain. Consequently, A-PARENT has localized the manufacturing of its products for customers in China and India in these markets. The decision to set up and upgrade the subsidiaries in China and India was therefore mainly driven by market-seeking motives. Still today, almost 100 percent of the output of A-PARENT's subsidiaries remains in the domestic market. While some trade among Asian countries takes place, exports to Europe or North America are very rare. The mechanism related to the interplay of exports and HQ support observed in the case of L-C is therefore not relevant for the subsidiaries of A-PARENT.

Besides the contribution of products to the MNE, a subsidiary might also offer access to favorable supply sources. In the case studies, the existence of such supply sources in a particular country or region was found to encourage efforts of the HQ to strengthen its subsidiaries in the respective locations. For both MNEs, China – and to a much lesser extent also India – play an increasingly important role for global sourcing. While the suppliers in China and India continue to serve mainly the subsidiaries in these countries, their business with international plants of the MNEs has increased rapidly in recent years. Sourcing from China and India is mainly motivated by low factor and material costs. But for certain raw materials (e.g. *rare earths*), China is virtually the only source worldwide.

In the case of L-C, a global sourcing team was set up already in 1996 to coordinate sourcing from China. The team is managed as a separate department with a direct reporting line to the global sourcing team in Germany. For certain raw materials (e.g. glass), the global lead purchaser is located directly at L-C. The presence of this global sourcing team has induced a spillover of technical know-how from the HQ to L-C. This was mainly due to the qualification of the global team. The global sourcing head of L-C reported:

> *Most staff in our department are engineers. [...] They have quality experience, and they also know the production, whereas in the plant purchasing department there are mostly buyers for commercial issues.* (Manager Global Purchasing, L-C)

The interaction with these skilled global purchasers has reinforced the capabilities of L-C's plant purchasing team and of its manufacturing operations in general. The contribution of L-C to L-PARENT was not limited to raw materials. The Chinese supplier market is also increasingly renowned for cost-efficient machinery. L-C has discovered several interesting solutions at its domestic suppliers. At one point, the purchasing team has discovered a smart solution at a machinery supplier at a fraction of the price of the standard solution in Europe.

L-C has purchased the technology and shared it with the MNE's manufacturing community. In order to ensure effective interaction with the Chinese supplier during the ramp-up of production with this new equipment, the global manufacturing mandate for the related product family was transferred from Germany to L-C.

In the other two Chinese subsidiaries, AM-C and AC-C, global supply from China was less common. This was mainly related to just-in-time delivery schemes as well as the high quality standards and lengthily qualification procedures of global automotive OEMs. However, the corporate HQ has declared low-cost sourcing as a strategic target, and the global BUs have increasingly attempted to grow their share of low-cost sourcing. In recent years, the domestic suppliers of AM-C and AC-C have started to supply certain commodity components to global plants of A-PARENT. But as of today, this global sourcing from China has not translated into additional HQ-support to the subsidiaries as observed in the case of L-C.

The case studies in India provided even less evidence for global sourcing and related upgrading efforts of the MNE HQs. Most domestic suppliers in India did simply not (yet) qualify for the global standards of the MNEs. And if they did, the volumes were still too low to generate attention in the HQ and to encourage additional investment in the subsidiaries.

Finally, a subsidiary might also contribute strategic assets such as unique knowledge and technologies to the MNE network. Such a contribution of strategic assets might can be assumed to generate high levels of HQ attention and might attract additional support and investment to the respective subsidiary.

While both MNEs continue to rely mainly on the global HQ and selected R&D centers in the developed countries for the generation of new knowledge, they were also increasingly looking for ideas from their subsidiaries in emerging economies. As observed for export-oriented manufacturing mandates, cross-border R&D mandates for Asia-Pacific or for the world market were also found to attract additional resources and mandates to the subsidiaries. In the case of L-C, for example, the assignment of a new R&D mandate for Asia-Pacific in 2007 was accompanied by a broad upgrading initiative of the global R&D team. New expatriate engineers were delegated to Foshan, additional responsibilities transferred, and new equipment aquired. The Indian sister subsidiary L-I lacked such global responsibilities, and has in turn never entered this *virtuous cycle* of new mandates and HQ-driven upgrading of its capabilities. Similar to the case of L-C, AM-C in Changsha has benefited from an ambitious upgrading initiative of the global R&D team once AM-C had been selected as the new R&D

center for Asia-Pacific. Among other measures, the global R&D team delegated experts to AM-C and provided resources to hire more than 100 engineers for the new center.

Also beyond such formal R&D mandates, the subsidiaries in China and India have contributed knowledge to their MNEs. In the eyes of the interviewed HQ managers, the *low-cost mindset* of local staff in these subsidiaries was one of their most valuable contributions to the MNE. AC-C in Suzhou, for example, has repeatedly been requested by the HQ to contribute to process development activities for the launch of new products – something traditionally taken care of by the MNE's plants in Germany. What has encouraged this request was the experience of AC-C's engineers in simple, low-cost process design, while technical solutions in Germany tended to be over-engineered and expensive. In a similar example, the engineers of AM-I in India were asked to support the development of a new product platform. A R&D manager of A-PARENT explained the advantage of AM-I's engineers as follows:

> *To reduce cost and develop unconventional solutions, I need countries like India. They are great at improvising, that's part of their culture. Had I assigned the project to Brazil, the solution would have been more sophisticated but less cost-efficient.* (Director Engineering, A-PARENT, trans.)

While this appreciation of AM-I's unique (low-cost) capabilities has reinforced its MNE-internal standing, it has not (yet) translated into a substantial upgrading of its R&D operations. The other case studies confirmed the link between the contribution of low-cost ideas and capabilities and the transfer of new responsibilities for low-cost development to the respective subsidiaries. However, as observed in the case of AM-I, this link was not found to have substantially altered to level of HQ support to these subsidiaries.

The subsidiaries did not only offer absorb to *low-cost design* skills in their host environment. As far as certain technologies are concerned, China and India are rapidly catching up with the technological frontier. The availability of sophisticated technologies in the host country of a subsidiary might generate HQ attention and encourage efforts to upgrade the absorptive capacity of the respective subsidiary. A good example for this mechanism is the experience of L-PARENT in the lighting market in China. While R&D in *traditional lighting* technology (e.g. incandescent or CFL lamps) is clustered in few developed countries, R&D in the emerging *solid-state lighting (SSL)* technology is increasingly taking place in Asia (in particular in Shanghai and Shenzhen, China).[19] In order tap into this knowledge, L-PARENT has invested in L-C in Foshan (e.g. LED assembly) and in the surrounding Pearl River Delta region (e.g. R&D center in Shenzhen).

[19] The strength of China is mainly owed to the fact that is has accumulated expertise in related electronics applications.

Another example for technology-induced HQ support is provided by the case of AC-C's development activities in the field of *eMobility*. As in SSL lighting, innovative activities in eMobility are increasingly taking place in China (with a particular focus on Shanghai and the surrounding Yangtze River Delta). The strategic need to not only monitor, but to actively embed into these innovative activities has encouraged A-PARENT to upgrade the R&D operations of AC-C in Suzhou (and also of sister subsidiaries in the region).

In the researched cases in India, such mechanisms related to sophisticated knowledge and technologies were not observed. Neither in the automotive nor in the lighting industry did the subsidiaries offer access to external knowledge sources which would have mobilized substantial HQ support.

Organizational structure of the MNE

The organizational structure of the MNE influences how the HQ engages with its subsidiaries. Organizational changes in the MNE are likely to affect HQ-subsidiary relations and thereby also the level of HQ support to its subsidiaries. Between 2005 and 2009, both MNEs underwent a re-organization (*verticalization*) into vertical global divisions and/or business units (BUs). The organizational changes were driven by the global corporate HQ and cascaded down into each product area. The new BUs were given responsibility for their respective global business. As intended, the BUs developed a more *entrepreneurial* stance towards their subsidiaries and started to get more involved in the operations of individual subsidiaries. The national organizations in China and India, which had so far dominated the operations of subsidiaries in these countries, lost most of their influence.

In particular the Indian subsidiaries have benefited from an increase of HQ attention in the course of the empowerment of the global BUs. In the years following the re-organization, the Indian subsidiaries of both MNEs were increasingly integrated into global knowledge exchange and benchmarking exercises, global alignment of manufacturing operations, and the development of global manufacturing strategies. In the case of AM-I in India, for example, the re-organization was found to have facilitated the upgrading of the subsidiary's MNE-internal role. In the old MNE organization, AM-I was consolidated under a strong national organization in India in which it played only a minor role in terms of size and profit. The global HQ had only limited information about (and interest in) the performance of AM-I and about market requirements in India. But after the re-organization of the MNE, AM-I became increasingly integrated into the global MNE network.

The manufacturing head of AM-I described these developments as follows:

> *We have a lead plant concept now. […] If I have a problem, I go to them. And I also get solutions from others, and so problems are solved faster. There was not much exchange with others before the verticalization.* (Deputy General Manager MFG & Engineering, AM-I)

The deeper integration into the MNE network has facilitated the alignment of AM-I's operations to the MNE's standards. This included the implementation of the global production system of A-PARENT at AM-I. The increased attention of the global BU has also motivated the transfer of sophisticated manufacturing technologies to AM-I in order to improve its quality and cost position. Encouraged by this support, AM-I is now thinking about bringing some of the outsourced process steps back in-house. A technical manager of AM-I reported:

> *Before verticalization, I don't think we would have got all this investment. Now we have access to world class technology. This is the consequence of the increased focus of Germany. If you look at our newer lines, they are at a higher level of automation. Quality safeguard is good, and process safeguards are also quite good. So we can try to bring certain things back in-house.* (Senior Manager Engineering & MFG, AM-I)

The systematic planning of production capacities on the global level in the course of the re-organization has increased opportunities for AM-I to secure export mandates. Both AM-I and HQ managers observed that capacities and capabilities of each subsidiary in the MNE network are now considered more carefully in global footprint decisions, while in the past AM-I was simply often not taken into account. The R&D department of AM-I was also affected by the re-organization of the parent MNE. The interaction with other sites and the HQ has intensified manifold. This included the participation in R&D jour fixes of the BUs with all global sites for the exchange of technical know-how and best practices. The empowerment of the global BUs has improved the coordination of A-PARENT's R&D activities and has generated new opportunities for AM-I. One example for this is the development of new product platforms for emerging economies – an initiative started after the re-organization. The platform project was carried out by AM-I together with other emerging economy subsidiaries under the guidance of HQ experts. AM-I's participation in the project has ensured that the new platforms are aligned with its manufacturing processes. In the past, the absence of such an alignment had repeatedly hindered exports from AM-I.

Also in the case of L-I in India, the re-organization of the parent MNE was accompanied by an increase in HQ attention, as the newly empowered global BUs were eager to improve their performance in India.

An expatriate engineer in L-I reported:

> *Communication [with the HQ] has intensified. There was also limited interaction with China before. India was operating more or less on its own. [...] But now, with the link to the BU and China, more technology and information gets exchanged.* (Project Manager Technical, L-I, trans.)

A benchmarking of L-I's operations with other sites of the MNE has taken place already in the old organization, but hardly any implications were drawn from it. After the re-organization, the global BUs initiated periodic benchmarking and exchange of best practices between the sites to improve their quality and efficiency. One example for this is a recent workshop of manufacturing managers of all emerging economy sites to discuss best practices related to a particular type of machinery. In the course of the re-organization, also the reporting lines in L-PARENT have changed. The manufacturing manager of L-I, for example, has been empowered to bypass the commercial president of L-I and to interact directly with manufacturing experts in the global HQ. Both HQ and subsidiary managers appreciated the more efficient communication and knowledge exchange the re-organization has created. Concerning L-I's product scope, the consequences of the increased HQ attention were mixed. On the one hand it has facilitated the transfer of new products to L-I and the adaption of products to Indian requirements. But on the other hand the new global BUs were not enthusiastic about some investment decisions of the old organization. After a strategic re-prioritization, the global BU cancelled or delayed parts of the designated investment in L-I. However, this re-prioritization was also related the global economic crisis, which coincided with the re-organization of the MNE. The re-organization has also affected L-I's R&D operations. The head of the electronics development center in Delhi reported that after the re-organization, the BU has increasingly pushed the Indian colleagues to expand their activities for the domestic Indian market and to align more closely with the plant in Sonepat.

In contrast to these findings in India, the re-organization of the MNEs did not have a comparable impact on subsidiaries in China. HQ attention on China has always been strong, and the Chinese subsidiaries of both MNEs were monitored closely throughout the last two decades. This was mainly due to the strategic relevance of the Chinese market. In the case of L-C, this close monitoring was also due to the subsidiary's export activity, which has generated additional HQ attention. However, the re-organization of the MNEs has affected the autonomy of the national organizations as well as of individual subsidiaries in China. A manager of L-PARENT, for example, observed that while L-I in India has appreciated the re-organization, L-C in China has been less enthusiastic about it because it feared that the empowerment of the global BUs might reduce its autonomy. And in fact, the decision what to

produce where in China has gradually shifted from the national HQ to the Asia-Pacific or global HQ. But for most operations of L-C, the re-organization did not have a strong impact, because major decisions had been closely aligned with the global HQ already before.

Also in the case of AM-C and AC-C, the re-organization of the parent MNE was not found to have had a strong effect on the subsidiaries' operations. AM-C has only been operational since the mid-2000s and has therefore had limited experience with the old organization. AC-C had been operational already under the old organization for several years. But as a highly strategic investment for the MNE, it has been monitored closely by the HQ since the beginning.

Attitudes and social relations in HQ-subsidiary relations

The attitude of HQ managers towards a subsidiary's performance was identified as another important condition for proactive HQ support. The discussion on subsidiary-endogenous capabilities in *chapter 3.4* has highlighted how a strong track record of a subsidiary can encourage HQ managers to transfer additional resources and mandates to this subsidiary. This mechanism was observed in particular in the case of L-C and AC-C in China. Both MNE HQs were very positive about the track record of these subsidiaries. Not only was their market performance outstanding, but also the level of initiative of their management and staff. This track record has motivated HQ managers in both MNEs to upgrade the operations of these subsidiaries. In contrast, the relatively weak track record of the two older Indian subsidiaries (L-I and AM-I) has discouraged HQ managers to upgrade their operations. HQ managers of L-PARENT, for example, reported about increasing frustration with their subsidiary L-I in India. They felt that their efforts to upgrade L-I had not led to the desired result. Consequently, such efforts were gradually reduced to the minimum requirements.

The perception of a subsidiary's track record in the HQ, and the motivation of HQ managers to support its evolution, is closely related to social relations between subsidiary and HQ personnel. An important mechanism to establish and maintain strong social relations between the two units is the delegation of expats. In the case studies, expats have played a pivotal role in strengthening HQ-subsidiary relations and in mobilizing support from the HQs. Interviews with HQ managers confirmed that the presence of expats has generated confidence to invest in particular subsidiaries. This mechanism has reinforced the successful upgrading of L-C, AC-C, and AM-C, which were run by expat communities for most of their history.

Besides the important role of expats, the case studies demonstrate that strong social relations can also be established by domestic managers. In most cases strong social relations of

domestic managers with the HQ personnel were facilitated either by work experience of domestic managers in the HQ or by former expats who had returned to the HQ.

Recent trends in both MNEs have reinforced social relations between the subsidiaries and the HQs. The re-organization of both MNEs has intensified interaction between actors in the MNE not only on the management level, but also on the working level. The interviewees in the subsidiaries – in particular those in India – observed that this trend has fostered social relations of the subsidiaries with the HQ. The introduction of global product platforms in some MNE BUs (e.g. in the case of AM-I and AM-C) has further intensified such interactions. The interviews suggest that this has over time reinforced confidence among HQ managers in the loyalty and capabilities of subsidiary staff, and has therefore (indirectly) facilitated the transfer of technology and resources to these subsidiaries.

Relevance of the host market for the MNE

The size of the host market and its priority in the growth strategy of the MNE is another important determinant for the level of support a subsidiary receives from the HQ.

For more than a decade now, strategies to succeed in China (and lately also in India) have been prominent on the corporate agenda of developed-country MNEs. The fact that the recent global financial and economic crisis has affected the MNEs' home markets more severely than the ones in China and India has further reinforced the focus on markets in Asia-Pacific. Since the mid-2000s, L-PARENT has strengthened its strategic focus on the emerging economies in general and on China and India in particular and has set ambitious targets for these markets. Facing losses in the developed countries at that time, L-PARENT declared success in China and India as a strategic priority. Around the same time, A-PARENT has started to pay more attention to these locations. In both MNEs this geographic shift in strategy has been initiated on the level of the corporate HQ and cascaded down to the BUs in the form of ambitious sales targets. These targets have motivated the BU management to intensify efforts in China and India by upgrading existing operations and investing in new ones.

The fundamental economic figures at least partially explain why the BUs in both MNEs have dedicated more efforts and resources to subsidiaries in China. In both MNEs, China has emerged as a major growth driver in the past two decades. Post-liberalization economic growth in India has proceeded at a slower pace than growth in China. While India's economy has expanded with high single-digit annual rates in the past decade, the absolute volumes in most sectors remained too small for most MNEs to take similar investment risks as in China. In automotive, about five times as many units were sold in China in the past decade than in

India (STURGEON and BIESEBROECK 2010). Similarly, sales of lighting products in China surpassed sales in India multiple times (SANDERSON et al. 2008, MCKINSEY 2011). In particular in the more sophisticated segments of both industries where the two MNEs hold a competitive advantage, India was lagging significantly behind China. The interviews in the MNEs confirmed that the larger size of the accessible market in China has translated into higher levels of attention and proactive support for the subsidiaries in China.

This (asymmetrical) support of the two MNE HQs to the subsidiaries in China and India was not constant over time, but has evolved together with the growth of the two host economies. When the two older subsidiaries in India (L-I and AM-I) were established in the 1990s, the size of the Indian market was still small, and consequently the support during and after the ramp-up phase was limited. With few exceptions, the HQs were not willing to invest in expatriate managers, new machinery, and international trainings. Only since India has increasingly been perceived as an untapped growth opportunity in the mid-2000s, the attention of the two MNE HQs for developments in India has increased.

When L-C was established in China in the mid-1990s, the domestic market was also still not large enough to encourage substantial investments by the HQ. The founding president of L-C reported that the lack of commitment of the HQ at the time had in fact slowed down the evolution of L-C in the initial phase. Only since the early 2000s, the HQ has demonstrated substantial commitment to continuously upgrade the operations of L-C.

In contrast to the experience of these early movers in India and China, the late movers among the subsidiaries have enjoyed full HQ attention right from the beginning. When AM-C and AC-C were established in the early 2000s, the Chinese market had already emerged as a strategic priority for A-PARENT. Consequently, the HQ has proactively supported the rapid evolution of their operations. By 2010, AM-C had by far outperformed its Indian counterpart in terms of technological sophistication of its operations and the scope of its mandates, although AM-I had enjoyed a head start of more than a decade. The same is true for AC-I. When this subsidiary was established in Bangalore in 2009, it entered a booming domestic market. The HQ was eager not to miss the opportunities in this market and consequently transferred the latest process technologies, technical experts, and expatriate managers. This has enabled a comparatively smooth start, and AC-I has earned a good reputation in the HQ after only two years of operation in a difficult market environment.

This discussion illustrates that the level of HQ support to a particular subsidiary evolves with the relevance of the host market for the MNE. This (partially) explains why the early movers

in India (and also in China) have experienced only moderate upgrading of their operation until the mid-2000s, and why the late movers, in particular in China, have been able to catch up with the early mover so rapidly. The discussion also (partially) explains why HQ support to subsidiaries in China has surpassed support to subsidiaries in India in both MNEs.

3.5.1.3 Indirect HQ support

Besides proactive support from the HQ in the form of expats, technology or resources, the HQ might also support subsidiary evolution more indirectly by encouraging subsidiary management to engage in upgrading initiatives.

In AC-C and AM-C, for example, many of the observed initiatives to optimize and expand the value-add scope of manufacturing had been more or less explicitly encouraged by the global BU. Both subsidiaries were given ambitious targets for costs and domestic market share, which could only be reached by accelerating the rationalization of existing and the localization of new operations in the subsidiary.

L-I and AM-I in India have experienced similar encouragement from their global HQs. The management of L-I was given directive to expand its in-house value-add instead of focusing too much on outsourcing options. And due to the low utilization of its new plant, the HQ encouraged L-I to develop its own strategy for how to proceed with the plant. Also interviewees at AM-I reported about requests from the HQ to demonstrate more initiative to strengthen the competitiveness of their operations. However, these efforts of the HQs to *push* the two Indian subsidiaries to take on more responsibility are a relatively recent phenomenon and are closely related to the empowerment of the global BUs.

Indirect support from the HQ also includes the level of autonomy the HQ grants its subsidiaries to pursue activities beyond existing mandates. Such *entrepreneurial* activities might eventually induce an expansion of the subsidiary's formal mandate. Among other factors, a subsidiary's autonomy to pursue activities beyond existing mandates is closely related to the level of attention the HQ pays to the subsidiary. AM-I and L-I in India have both enjoyed significant autonomy in the sense that they were not closely monitored – at least until recently. This is illustrated by AM-I's efforts to develop a new product together with a domestic customer. During this development, AM-I did not follow the formal R&D process of A-PARENT, but rather operated in a trial-and-error mode. This high degree of autonomy was made possible by the fact that the global R&D team did paid close attention to AM-I's

activities. The interviewees in AM-I were convinced that under stricter HQ monitoring such an unsystematic project would have been terminated already in the initial stage.[20]

The case studies in China provide similar examples for such innovation in the periphery of the MNE. When AC-C developed its first independent product (a low-cost airbag), the global R&D team was aware that some work was going in the subsidiary, but it was not aware of the scope and impact of the project. With full transparency, the global R&D team would very likely have required a closer alignment of the project with the HQ. Such an alignment would have threatened the timeline as well as the target cost of the project. But due to the lack of HQ attention, AC-C was able to pursue the project independently without much coordination with the global R&D team. For the low-cost innovation aspired by AC-C, this working mode proved very successful.

The greater relevance of the Chinese market for both MNEs translated into stricter monitoring of the Chinese subsidiaries compared to their counterparts in India. Everything else being equal, the Indian subsidiaries have therefore enjoyed more freedom to pursue autonomous initiatives. Additionally, the expat communities in the Chinese subsidiaries were more knowledgeable about (and committed to) the MNEs' standardized procedures, and therefore less flexible to run pragmatic projects as observed in India. But due to a range of endogenous and external factors, this advantage has not translated into higher levels of innovative activity in India. And the few innovative activities the Indian subsidiaries realized beyond their mandates have contributed substantially to the upgrading of their operations. In fact, it was mainly the projects conducted in close alignment with the HQ (e.g. the platform development project by AM-I since 2006) which have had the greatest observable (positive) impact on the evolution of the Indian subsidiaries. The same was observed for the few autonomous projects identified in China. With regard to the evolution of the subsidiaries, the relevance of autonomy to pursue activities beyond existing mandates has therefore not played a crucial role in the case studies.

3.5.1.4 HQ-level resistance

MNE HQs do not only always support the upgrading of their subsidiaries. The case studies provide interesting evidence for how direct (or more indirect) resistance on the HQ level has repeatedly impeded the upgrading the researched subsidiaries. Such resistance includes

[20] See GLÜCKLER (2010) for a study on innovation in the periphery of MNEs.

barriers to knowledge and technology transfer, resistance against a subsidiary's initiatives, and the MNE-wide restriction of resources.

Barriers to knowledge and technology transfer

Concerns of HQ managers to share knowledge and technology were found to have slowed down the upgrading of certain subsidiary operations in the case studies. In AC-C, for example, both subsidiary and HQ managers reported that the upgrading of R&D operations has been slowed down by the hesitation of HQ managers to transfer certain knowledge to China. Core knowledge such as software code was not accessible for AC-C's engineers (at least not for the domestic ones). This has slowed down the accumulation of capabilities in these areas and has deprived AC-C from upgrading opportunities. Also L-C has experienced such barriers on the HQ level. HQ managers have repeatedly blocked the localization of certain products as requested by the subsidiary. An expat manager of L-C observed that this hesitation of the HQ is increasingly threatening L-C's cost position in China. Also L-I and AM-I in India reported about (occasional) instances of resistance in the HQ to share knowledge and technology. However, in contrast to findings in China no interviewee in India claimed that this resistance has substantially altered the evolution of the subsidiary.

Attitudes and concerns in the HQs of both MNEs were not always consistent across different functions and hierarchical levels. While the corporate HQs mainly focused on the hidden potential associated with global knowledge sharing and supply chain efficiencies, BU managers and staff in the German plants also expressed considerable concerns about the practical consequences of such a strategy for the plants, R&D centers, and suppliers in the home market. A concern expressed frequently in the interviews was the impact of the upgrading of Chinese and Indian subsidiaries on jobs in the home market. A senior engineer in L-C observed that such concerns can impede the transfer of operations to China:

> *[We still have gaps] in some high end automotive and high-pressure-discharge technologies. [...] These are the footprint decisions for the future. [...] I think jobs in Germany or other high-wage countries are a clear obstacle, because such footprint decisions are final […] and will not be reversed.* (Head of Development P, L-C, trans.)

An expatriate manager in AC-C argued that such concerns in the HQ might reflect a more general insecurity towards the rapid growth of emerging economies such as China:

> *There are many concerns [in the HQ] about China. When you take a look at this rapid growth and China's role in the world – not only in automotive but also politically – then you should not expect all others in the organization to be enthusiastic about your growth and future expansion plans.* (Vice President MFG S, AC-C, trans.)

Another concern expressed by HQ managers was the loss of intellectual property (IP) to firms in the host environment. MNE's operating in markets with underdeveloped institutional frameworks face a trade-off between protecting IP and serving the market in a flexible and cost-efficient way. Depending on the technology requirements of the subsidiaries and markets, different levels of HQ resistance were observed in the case studies. AC-C was operating closer to the technological frontier than most other subsidiaries. Consequently, IP protection has played a very important role here. A manufacturing manager of AC-C reported:

> *There are restrictions in the sense that innovative processes are not shared with us due to concerns that they might leak to the outside. We must always keep in mind [...] that Asia – and in particular China – has a different attitude towards IP than Europe. Therefore we have open exchange of processes known to the market. But whatever is an innovation is often not shared with us.* (Vice President MFG E, AC-C, trans.)

In the case of AM-C, the domestic market did not require sophisticated, proprietary technologies to be transferred to the subsidiary. Consequently, this subsidiary has experienced less resistance to knowledge exchange on the HQ level.

The level of HQ resistance does not only depend on technology requirements of the subsidiaries, but also to a considerable extent on the IP regime of the host country. Frequent media reports about insufficient IP protection in China – and in some cases prior negative experience of the MNEs in China – fueled concerns in the HQs. The Regional President of AC-C reported that these concerns have slowed down the evolution of the subsidiary:

> *China does not have a very good reputation in terms of IP. Therefore it is true that our organization in Germany has strong reservations. They want to transfer know-how only to the necessary part for the market. They do not want to step ahead on that. [...] There is a risk that this slows us down.* (Regional President E, AC-C)

Also L-C has experienced such barriers related to concerns about IP. Requested transfers of sophisticated products to L-C, for example, were blocked by the HQ mainly because it feared that proprietary technologies might leak to the domestic market.

In contrast, AM-I and L-I in India did not experience comparable barriers to knowledge transfer related to IP. Both MNEs did not regard IP loss as a pressing problem in India. And the fact that the subsidiaries (and the domestic market) in India did in most cases not require the latest technologies has further mitigated concerns in the two HQs.

Besides these concerns about IP loss, barriers to knowledge and technology transfer are also the result of the corporate (risk) cultures of the MNEs. Everything else equal, A-PARENT has demonstrated greater willingness to accept the risks associated with the transfer of sophisticated technologies to China and India. The globalization of its customer base and the

dynamic growth of the Chinese market have required the MNE early on to accept these risks in order to compete globally. The corporate culture of L-PARENT has put more emphasis on protecting proprietary knowledge, and the MNE was generally less willing to accept the risk of IP loss abroad (at least until recently). Among other factors, this had to do with the relatively long innovation cycles and oligopolistic market structures in the lighting industry. But with the recent acceleration of innovation cycles, the globalization of markets, the emergence of new competitors, and changes in top management, L-PARENT has undergone a cultural change, and its willingness to undertake innovative activities closer to the markets (i.e. in China) at the risk of losing IP has increased.

MNE-wide restriction of resources

Besides barriers to knowledge and technology transfer, HQ-level resistance to subsidiary evolution can also be related to MNE-wide restriction of resources. In particular during the recent financial and economic crisis, corporate directives to cut back spending have affected the researched subsidiaries. In some cases, these restrictions have slowed down the evolution of the subsidiary's operations. This is particularly true for the fast-growing subsidiaries in China. Managers of AC-C in Foshan, for example, reported that the HQ had decided to freeze headcount and investment worldwide during the crisis in 2008 – irrespective of the situation in individual markets. While the global crisis did affect the Chinese automotive market, the downturn was moderate compared to the MNE's home market. When the Chinese market was back on the growth track, the MNE-wide crisis policy was experienced as a barrier to AC-C's growth ambitions. Each new hire at AC-C, for example, required time-consuming release-approve from a board member in Germany, and several requests have been rejected. Moreover, some of the planned investments in AC-C got delayed. Restrictive cash flow targets posed additional challenges to the subsidiary. The evaluation of this *one-fits-all* crisis reaction differed between HQ and subsidiary managers. While HQ managers argued that no planned investment which had been justified by the domestic market had been terminated, subsidiary managers argued that their expansion in China had in fact been slowed down by the global crisis reaction. But the temporary restriction of resources had also a positive effect: The manufacturing head of AC-C reported that it has forced the subsidiary to focus on productivity improvement – a task often neglected in phases of rapid growth. In the long-run, the restriction of resources might therefore have strengthened rather than weakened the competitiveness of AC-C.

L-I in India has also experienced adverse effects related to MNE-wide crisis reaction. The crisis coincided with the establishment of its second plant and the transfer of new product lines. While several of these projects were finalized accordingly, the transfer of some product lines was terminated by the global BU. This decision was mainly related to the crisis in home market of L-PARENT, but also to the temporary slowdown in the Indian market.

Also AM-I faced global cost reduction targets in the course of the crisis which appear unjustified when looking at the Indian market in isolation. However, the adverse effect of these measures on the evolution of its operations does not appear to have been substantial.

Resistance to subsidiary-level initiatives

Both HQs have been generally open to subsidiary-level initiatives to optimize their operations and improve their market position. However, some cases also provide evidence for resistance of HQ management to such initiatives. A R&D manager of L-PARENT with prior experience in L-C, for example, reported that HQ managers had repeatedly delayed his initiatives:

> *Technical adjustments always require confirmation. [...] This takes time and can be frustrating. And it can of course also be used to slow down others. If you want to qualify a product or material from China, they [the HQ] will always find a violation of the product norm, which was written for product or materials in Europe.* (Manager R&D EU, L-PARENT, trans.)

Similarly, efforts of AC-C to adjust manufacturing processes to domestic market conditions provoked fierce resistance in the German lead plants. The other case studies provide additional evidence for HQ resistance to changes put forward by the subsidiaries.

Underlying this resistance was in many cases structural inertia in the HQ organizations. Managers in the HQ and in the lead plants in Germany were opposing changes to standardized processes which have been running in a certain way for decades. The automation of manufacturing processes, for example, was widely accepted in German plants as the best way to ensure constant high quality. Plans of AC-C and other subsidiaries in China to reduce automation and to increase the share of manual labor provoked lengthy discussions with HQ managers, who emphasized the (presumed) quality risk and blanked out the flexibility gains associated with this manufacturing scheme. BIRKINSHAW and RIDDERSTRALE (1999) refer to such inertia as the *corporate immune system* of the MNE.

Besides conflicts about technical aspects, the interviews also found evidence for ethnocentric attitudes among HQ managers which has affected their behavior towards the subsidiaries. In particular in earlier stages of the researched subsidiaries, HQ managers in both MNEs tended to underestimate the innovative potential of their inexperienced subsidiaries. Product and

process innovation was considered to be only possible with the deep experience in the developed home markets. In some interviews, HQ managers also invoked the *cultural mindset* of their Chinese and Indian engineers as a reason why innovation might not originate from these locations. The analysis the two older Chinese subsidiaries (L-C and AC-C) suggests that this attitude has in fact impeded a faster upgrading of the R&D operations of these subsidiaries. However, with the growing awareness for the merits of innovation originating from emerging economies (e.g. innovation for low-cost and/or flexibility), the attitude in the HQs towards innovation in China and India has become more differentiated. While many HQ managers still do not believe that R&D activities in China and India on certain core technologies can add much value, they were increasingly eager to utilize the emerging-economy-specific innovations originating from these locations.

Despite these and other examples for resistance against subsidiary initiatives, HQ-subsidiary relations were in most cases of a synergistic nature in the sense that most initiatives were supported. In fact, most of the interviewees agreed that the resistance has not substantially altered the evolution of their operations. The technical head L-C, for example, reported:

> *Of course there is someone in Germany watching us. [...] But I am not aware that we have been slowed down substantially.* (Vice President Technical, L-C, trans.)

Along similar lines, the Engineering Director of AM-C observed:

> *I do not want to claim that I could have been much faster if others had not impeded my efforts. […]But it took a lot of convincing.* (Director Engineering, AM-C, trans.)

Also the R&D head of L-C acknowledged that the resistance of the HQ has not substantially slowed down the upgrading of the subsidiary's operations.

The resistance of the two MNE HQs against subsidiary-level initiatives has not been constant over time, but has evolved gradually together with internal and external developments. In particular the increasing relevance of the domestic markets in China and India has sent concerns about potential adverse effects to the background. Failure in China (and India) was increasingly seen to pose greater strategic risk to the MNE than losing some knowledge there. Consequently, the two MNE HQs have increasingly encouraged interaction and cooperation between the global BUs and lead plants with their subsidiaries in China and India. At the same time, the increasing relevance of their host markets has reinforced the subsidiaries' bargaining power in the MNE.

A manufacturing manager at AC-C, for example, reported how the growth of the market had facilitated his efforts to overcome resistance in the HQ:

> *There are many concerns [in the HQ] about China. [...] What you need in such a situation is the support from the group president. And he always used to say 'shift to Asia' or 'go to China'. [...] Without this support it would have been even more difficult.* (Vice President MFG S, AC-C, trans.)

Other examples in the case studies confirm that the increasing relevance of the host markets – and therefore of the subsidiaries' bargaining power – has enabled the subsidiaries to secure top management support to overcome resistance on different levels in the MNE network.

Another important mechanism to overcome HQ resistance identified in the case studies was the reduction of fluctuation. Concerns of HQ managers about IP loss in China (and India) were in most cases closely related to the high fluctuation in the subsidiaries. This was particularly true for the subsidiaries in China. Acknowledging the importance of fluctuation, AC-C and L-C have dedicated considerable efforts to enhance the stability of their workforce in recent years. The interviews with both HQ and subsidiary managers suggest that the success of these efforts to reduce fluctuation has played an important role in overcoming resistance to knowledge transfer and subsidiary upgrading.

Furthermore, the strengthening of social relations between the HQ and the subsidiaries was found to contribute to overcome HQ resistance. An R&D manager in AC-C, for example, argued that the success of his initiatives was closely linked to social relations with the HQ:

> *You need to have a network. If the people [...] do not know you, you will not get the projects. Coordination and interaction [with the HQ] is important in this job. […] This is not mainly about technical or commercial issues. Sometimes you just have to give people the feeling that it is ok to transfer knowledge or support the Chinese colleagues.* (Director R&D E, AC-C, trans.)

In many cases, the delegation of expatriate managers is an interim solution until domestic managers have gained sufficient experience in the MNE to take on the task. The shift from expats to domestic managers can be a challenge for HQ-subsidiary relations – in particular in the IP-sensitive R&D area. The same R&D manager of AC-C reported:

> *This department was run by a German manager before. When he left, the interface of this department to Germany disappeared. This has caused a significant shift in cooperation and interaction [with the HQ]*. (Director R&D E, AC-C, trans.)

In this example, the skilled Chinese successor was replaced by another German expat after less than two years due to the (perceived) deterioration of relations with the HQ.

The case of L-I's R&D center in Delhi provides a similar example. With its legacy as offshore R&D center for the US, it has successfully served internal customers there. But with German or European customers it has never gained leeway. The head of the center observed:

> *With the US we had good relations. Most of the guys controlling the design center there were Indians. [...] If a German guy would have come in, then he might have strengthened the connection to Germany.* (Director Engineering, L-I)

These examples emphasize the relevance of social relations between subsidiary and HQ staff for overcoming the barriers to knowledge and technology transfer to a subsidiary.

3.5.2 The Asia-Pacific HQ

Most studies on HQ-subsidiary relations and subsidiary evolution aggregate the entire MNE-internal hierarchy under the global HQ (see e.g. BIRKINSHAW and HOOD 1998). However, due to the increasing internal complexity of large MNEs, MNE subsidiaries are likely to maintain vertical relations on different levels. Relations to the global HQ are often complemented by relations to dedicated HQs for different world regions (e.g. Asia-Pacific).

In the recent decade, the two researched MNEs have made attempts to disintegrate their organizations in geographic terms in order to maintain sufficient flexibility in an increasingly multi-speed global market place. Significant responsibilities have been shifted from the global level to separate HQs in different parts of the world. This trend could be observed for both the corporate level (e.g. establishment of a corporate Asia-Pacific HQ headed by a board member of the MNE) and the BU level (e.g. establishment of a dedicated BU HQ for Asia-Pacific). In both MNEs, the trend has mainly affected the sales and development functions, while manufacturing has remained under the control of the global HQ. Besides Japan, the most important market in Asia-Pacific for both MNEs was China. Consequently, the Asia-Pacific HQs of both MNEs were located there.

The trend towards the geographic disintegration of decision making was particularly prevalent in L-PARENT. An expatriate R&D manager at L-C reported:

> *[L-PARENT] has a matrix organization. I am part of the BU in Hong Kong, and at the same time part of the global R&D community. [...] Hong Kong plays an important role for the strategy of Foshan. They decide on the product portfolio, pricing, resource planning, etc.* (Head of Development P, L-C, trans.)

In order to improve flexibility and time to market, the Asia-Pacific HQ in Hong Kong was assigned the responsibility for product development in Asia-Pacific. To utilize existing structures, L-C in Foshan was upgraded into the R&D center for Asia-Pacific. In

consequence, decisions regarding R&D in Asia-Pacific were increasingly taken by L-C in alignment with the Asia-Pacific HQ in Hong Kong. For L-C, these developments have reduced some of its interaction with the global HQ. However, the technical exchange in R&D and manufacturing expert communities continued to take place mainly on a global level.

In the case of L-I in India, the geographic shift of decision making towards Asia-Pacific has also reduced interaction with the global HQ. The manufacturing head of L-I reported:

> *Earlier, for each and every thing we were looking at Germany. And that is not the case anymore. Now we have a regional setup. First we look at the region, and then we look at Germany. So I would say that interaction with Germany has come down, and it has increased much more at the regional level.* (Vice President MFG, L-I)

Interviewees in L-I appreciated this development, because the Asia-Pacific HQ was found to be generally better informed about the situation in India than the global HQ. With the empowerment of this HQ, the ability of L-I to influence the strategy and resource allocations for the Indian market has increased significantly. In contrast to the global HQ, which used to focus mainly on the largest markets (e.g. China), the Asia-Pacific HQ demonstrated strong interest in L-I's manufacturing operations. The Asia-Pacific HQ was also eager to reduce the dependence of L-I's R&D center on US customers and to expand its operations for the domestic Indian market. These findings demonstrate that the geographic disintegration of decision making has helped L-I to end its isolation in the MNE and has increased the subsidiary's integration into the BU network in Asia-Pacific.

A-PARENT maintains an Asia-Pacific HQ for its automotive BUs in Shanghai to coordinate operations in Asia-Pacific and to align global strategy with the specific requirements in the different markets. But the interviews suggest that the influence of this HQ vis-à-vis the global BUs in Germany was not as strong as in the case of L-PARENT. Key decisions affecting the operations of subsidiaries in China and India remained mostly on the level of the global BU. However, the interviews indicate that the relevance of the Asia-Pacific HQ has increased in recent years. By bundling the interests of A-PARENT's subsidiaries in the dynamic emerging economies in Asia, it has increasingly sharpened its profile vis-à-vis the global BUs. This was particularly relevant during the recent economic crisis after 2008, when many subsidiaries in Asia-Pacific felt that the situation in their markets was not sufficiently taken into account by the global HQ. A manager of AM-I, for example, reported that while the Chinese subsidiaries alone might be powerful enough, for the Indian subsidiaries the representation of the particularities of emerging economies through the Asia-Pacific HQ has been very important.

As observed in the case of L-PARENT, the Chinese subsidiaries of A-PARENT were also increasingly assigned R&D responsibilities for Asia-Pacific. AM-C, for example, has

assumed the role as the Asia-Pacific R&D center in 2008. The efforts of the Asia-Pacific HQ in Shanghai to create awareness for the unique requirements of markets like China and India (e.g. the need for *speed to market*) have accelerated (although not determined) this delegation of R&D responsibility to Asia – and therefore the upgrading of AM-C.

These observations demonstrate that the Asia-Pacific HQs have played an increasingly important role for the subsidiaries. This is particularly true for the Indian subsidiaries, which have received only limited attention from the global HQs before. But when compared to the dominant role of the global HQ, the contribution of the Asia-Pacific HQs to the observed evolution paths of the subsidiaries appears to have been only minor.

3.5.3 The National HQ

Corporate HQs on the host country level are not uncommon for large MNEs with several subsidiaries per host country. Both A-PARENT and L-PARENT maintain corporate HQs in China. In India, only A-PARENT operates multiple subsidiaries and a national HQ in Bangalore, while L-I is the only unit of L-PARENT in this country. In both MNEs, the national HQs have played an important role in areas such as public relations, marketing, recruiting, training, or purchasing. In some cases, the responsibilities of the national HQs have also included strategic decisions related to the product portfolio of subsidiaries in the country.

In organizational terms, both MNEs have matrix structures in which the national (corporate) HQs and the global BUs struggle for influence. In both MNEs, the balance of power in this matrix has shifted towards the global BUs in recent years, and the importance of the national HQs has diminished. But this does not reflect a general trend towards less responsiveness to the host environment. It is rather a consequence of the re-organization of both MNEs into global BUs. Before the re-organization of both MNEs in the mid-2000s, the national HQs had exerted significant influence on the evolution of the subsidiaries in the country. But with the re-organization into BUs, most of this authority has been carried over to the global BUs.

AM-I in India provides a particularly good example for this development. Until the mid-2000s, the national organization of A-PARENT in India with its HQ in Bangalore has exerted strong influence on the development of Indian subsidiaries. Only when knowledge and technology transfers from Germany to India were concerned, the global HQ would interfere in India. The evolution of AM-I in this early phase was therefore largely determined by the national HQ. As one of its smaller and less profitable subsidiaries, AM-I has received less resources and attention from the national HQ than certain sister subsidiaries in India. This

neglect on the national level has contributed to the moderate evolution of AM-I in the early phase. But since the re-organization of A-PARENT, the global BU has increasingly assumed responsibility for the evolution of AM-I, and the national HQ has been degraded to corporate functions (e.g. human resources). Interviewees in AM-I (and also in AC-I) reported that the national HQ in India has since recently attempted to resume some of its influence on the subsidiaries (e.g. in important investment decisions), suggesting that the balance of power between subsidiaries, national HQs, and global BUs is constantly evolving.

A similar example was observed in the case of L-C in China. Before the re-organization of L-PARENT, key decisions affecting the evolution of L-C used to be taken (or were at least influenced) by the national organization of L-PARENT in China. But in contrast to the experience of AM-I in India, L-C was the flagship subsidiary of the MNE in China, and has therefore received considerable resources and attention. With the empowerment of the global BUs, the national HQ has lost its influence on the manufacturing and R&D operations of L-C. Only in marketing and sales and in some other corporate functions, the national HQ continued to carry out activities for all subsidiaries in China.

These observations demonstrate that relevance of vertical relations to a national HQ for the evolution of individual subsidiaries depends on the allocation of formal roles and responsibilities as well as informal bargaining power in the MNE network.

Table 5 provides a pragmatic summary of the findings of this section:

Subsidiary	Location	Global HQ Active support	Global HQ Indirect support	Global HQ Resistance	Asia-Pacific HQ	National HQ
L-I	NCR (Delhi/Sonepat)	◕	◕	◑	◕	◑
AM-I	Karnataka (Bangalore)	◕	◕	◔	●	◔
AC-I	Karnataka (Bangalore)	●	◑	◑	●	◑
L-C	Pearl River Delta (Foshan)	●	◕	○	●	◕
AM-C	Hunan Prov. (Changsha)	●	◕	◑	◕	◕
AC-C	Yangtze River Delta (Suzhou)	●	◕	○	◕	◕

○ Strongly impeding ◔ Impeding ◑ Neutral ◕ Supportive ● Very supportive

Table 5: Impact of vertical relations on subsidiary evolution[21]

Source: Table provided by author.

[21] Qualitative assessment based on case study analysis. The table indicates the *direction* of impact (not the magnitude) of vertical relations with the MNE HQ (on different geographic levels) on the evolution of the researched subsidiaries.

3.6 Horizontal relations with sister subsidiaries

MNE subsidiaries maintain multifaceted relations with sister subsidiaries in the MNE. BIRKINSHAW et al. (2005) observe that "*the relationships between subsidiaries and their sister plants [...] are a fascinating blend in that they rely on one another for transferring ideas and ways of working, but ultimately they are in competition for new investment or even […] survival*" (BIRKINSHAW et al. 2005: 246). This motivates an investigation of two mechanisms in horizontal relations: competition as well as knowledge transfer and mutual support. Horizontal competition for the MNE's resources and mandates might motivate upgrading initiatives of individual subsidiaries, while horizontal knowledge transfer and support might strengthen a subsidiary's capabilities and enable initiatives to expand its operations. Horizontal relations can exist on different geographic (global, macro-regional, national) and organizational (same-BU, integrated, lateral) levels. The following discussion attempts to disentangle these different types of horizontal relations to generate insights into how horizontal relations influence the evolution of MNE subsidiaries.

3.6.1 Horizontal relations on the global level

The researched subsidiaries in China and India have maintained both competitive and collaborative relations to sister subsidiaries in all parts of the world. In this chapter, the focus will be on relations to sister subsidiaries outside Asia-Pacific and outside Germany.[22]

Competition

The *shift to Asia* in the global strategy of the two MNEs has diverted resources away from subsidiaries in other parts of the world towards subsidiaries in China and India (and some other emerging economies). Owed to the dynamic growth of their domestic markets, the subsidiaries in China and India have clearly been among the winners of this MNE-internal re-allocation of resources. This became particularly evident in the recent global economic crisis when investment in a number of projects in China and India continued despite a global investment freeze. This global competition for resources in the MNE has affected all types of horizontal relations: same-BU relations, integrated relations, and lateral relations.

[22] Relations to sister subsidiaries in Asia-Pacific are covered in *chapter 3.6.2* below. Relations to sister subsidiaries in Germany have already been covered in the discussion on vertical relations in *chapter 3.5.1*. As far as relations to subsidiaries in Germany are concerned, vertical and horizontal relations are often blurred. In particular in the ramp-up phase, the researched subsidiaries have maintained hierarchical relations to lead plants in Germany. Over time, some of these relations have evolved towards horizontal relations.

In *same-BU relations*, horizontal competition for product mandates was fostered by the global BUs as a means to motivate optimization efforts of the subsidiaries. L-C was the only subsidiary in the sample with substantial export mandates. Its MNE-internal cost-competitiveness was mainly owed to favorable factor conditions, but also to periodic rationalization measures. In order to secure additional export mandates also for sophisticated products for the developed economies, L-C's engineering team has engaged in optimization initiatives to improve its quality standards. These efforts have attracted additional mandates to the subsidiary. As a consequence of its upgrading efforts, however, L-C has lost its cost competitiveness in the domestic market, suggesting that global competition for export mandates can be a double-edged sword for subsidiaries in an emerging market environment.

AC-C and AM-C in China were almost exclusively focused on the domestic market. Global competition for product mandates did therefore neither threaten nor facilitate the evolution of their manufacturing scope. L-I and AM-I in India have demonstrated ambition to compete for MNE-internal export mandates. With their uncompetitive cost position in the domestic market, global export mandates promised attractive growth opportunities for these subsidiaries. In particular AM-I has therefore demonstrated considerable efforts since the mid-2000s to improve its MNE-internal competitiveness. Despite these efforts, the two subsidiaries have not yet expanded their geographic scope. In the near future, at least AM-I might start to export to international markets. For both subsidiaries, the main MNE-internal competitors were not located on the global level, but in the immediate neighborhood – China. The relations between subsidiaries in China and India will be covered in the next chapter.

Relations to *integrated* and *lateral* sister subsidiaries outside Asia-Pacific and Germany were rare, and strong competitive effects of such relations were not observed in the case studies.

Knowledge transfer and support

Knowledge exchange in the global MNE network has played an important role for the upgrading of the capabilities (and indirectly also of the operations) of the researched subsidiaries. The re-organization of both MNEs in the mid-2000s has intensified horizontal interaction within the global BUs. In both MNEs, the exchange of technical knowledge was institutionalized in regular meetings of expert communities. A manufacturing manager of AC-C, for example, described the relevance of these horizontal platforms as follows:

> *We have centers of competence – that is one of the key topics. [...] Here we analyze and improve manufacturing processes. We also learn how to implement processes for new products to run zero-error processes.* (Vice President MFG E, AC-C, trans.)

The other subsidiaries of A-PARENT and L-PARENT reported about similar formats for global knowledge exchange in their global BUs. This knowledge exchange was particularly important for the Chinese subsidiaries with their relatively sophisticated operations (by emerging economy standards), as most neighboring Asian subsidiaries (except Japan) did not offer substantial learning potential to them. Through knowledge exchange with the developed economy subsidiaries in Europe and the US, the Chinese subsidiaries were able to improve their capabilities and the performance of their operations.

Joint R&D projects with sister subsidiaries provided valuable opportunities for cross-border knowledge exchange. AM-I in India, for example, has benefited from a joint R&D project with its counterpart in Brazil. From working with experienced Brazilian engineers, the relatively inexperienced engineers of AM-I were able to substantially improve their product development skills. Similarly, product development engineers of L-I interacted frequently with internal customers in the US. Through this interaction, they have accumulated increasingly sophisticated capabilities in the niche of electronic control gear. With the help of these new capabilities, L-I has gradually expanded the scope of its R&D operations.

Knowledge exchange in horizontal relations did not only take place in formal R&D projects or service agreements, but also in short-term, *ad-hoc* project settings. In particular the two sophisticated subsidiaries in China (AC-C and L-C) have repeatedly joined forces with sister subsidiaries to realize learning potentials. A manufacturing manager of AC-C reported:

> *Every time I find something interesting [in A-PARENT], I will send my troops. [...] Currently we have a project with Portugal in an area they are particularly good at. I sent four to five people there over a longer time period to learn from them, and now we have just implemented the project here.* (Vice President MFG E, AC-C, trans.)

Interviewees at L-C reported about similar projects with international sister subsidiaries. While most of these knowledge exchange projects involved sister subsidiaries of the same BU, in few case cases best practices could also be absorbed across BU boundaries.

3.6.2 Horizontal relations in Asia-Pacific

While horizontal relations with sister subsidiaries in the developed countries are often characterized by a gap in costs, knowledge, and technologies, neighboring subsidiaries in Asia-Pacific (with few exceptions such as Japan, South Korea, or Australia) feature comparatively homogenous competitive and institutional environments. These similarities might facilitate knowledge exchange. At the same time, however, subsidiaries in neighboring emerging economies might often compete with each other for low-cost product exports and

R&D mandates and might even threaten each others' domestic markets. Due to the relevance of China and India for the two MNEs and the availability of interview data of subsidiaries in these locations, the following discussion will pay particular attention to horizontal relations between China and India.

Competition

With the re-organization of both MNEs into global BUs and the strengthening of the Asia-Pacific organization of both MNEs, the researched subsidiaries were increasingly facing competition with (mostly *same-BU*) sister subsidiaries in Asia-Pacific. This included competition for HQ resources as well as for manufacturing and R&D mandates.

Both MNEs have allocated more resources to their subsidiaries in China. Among other factors, this was related to the importance of China's domestic market and supply sources. This asymmetrical allocation of HQ resources has already been covered in the discussion on vertical relations (*chapter 3.5*) and shall not be repeated here. Instead, this section will focus on horizontal competition for export mandates.

The subsidiaries in China have by far outperformed their Indian counterparts in terms of exports: AM-C exports about 25 and L-C about 40 percent of their output, whereas AM-I and L-I focus entirely on the domestic market. The evolution of the geographic scope of these subsidiaries has been closely related. An expatriate engineer at L-I, for example, explained why India has not succeeded more in expanding its geographic scope:

> *The Asian market is controlled by China. […] And also by Indonesia and Japan where [L-PARENT] operates manufacturing sites. This market has already been developed.* (Project Manager Technical, L-I, trans.)

Interviewees in AM-I made similar comments regarding China's dominance in Asia and how this dominance has deprived subsidiaries in India from capturing export mandates. The interviews in the two HQs largely confirmed the assessment that the superior performance (and business environment) of the subsidiaries in China has left little room for the Indian subsidiaries to upgrade their mandates across national borders. The failure of the two Indian subsidiaries to compete successfully with the counterparts in China was mainly related to their uncompetitive cost position, which can be traced back to the characteristics of the subsidiaries (e.g. low productivity and lack of initiative) and the host environments (e.g. high duties and poor infrastructure) as well as to the lack of support from the HQs.

The superior performance of Chinese subsidiaries did not only deprive the Indian subsidiaries from export mandates, but it also constituted a direct competitive threat to their operations.

While imports of products with small volumes or complex technology requirements from China to India were not uncommon in both MNEs, large-scale imports of products from China have so far been impeded mainly by the high import duties of the Indian government. A manager in the HQ of L-PARENT reported:

> *Without import duties, we could easily serve the Indian market from China. There would be no pressure to have a plant there.* (Vice President C, L-PARENT, trans.)

Interviewees at AM-I in Bangalore shared the assessment that imports from China might eventually threaten the existence of their operations in India.

The subsidiaries in China and India have also competed with each other for R&D mandates. As mentioned above, the Chinese subsidiaries in both MNEs were recently assigned R&D responsibilities for the emerging economies in Asia-Pacific and globally. In the case of L-PARENT, this was a natural choice given the sophistication of L-C's R&D team and the relevance of its domestic market. In the case of A-PARENT, the location choice for a new R&D center was not as obvious as in the case of L-PARENT. AM-I had realistic chances to secure this mandate. But mainly owed to the competitive supplier base in China, AM-C has secured the investment. A R&D manager of A-PARENT in Germany reported:

> *Until recently India was ahead of China in terms of competence. [...] But India's disadvantage is its small supplier base. […] This was the reason why we decided to move forward with China.* (Director Engineering, A-PARENT, trans.)

The BU-internal competition for manufacturing and R&D mandates has generated pressure on the subsidiaries to improve their operations. The General Manager of AC-C reported:

> *[In the business unit] we exchange information about our cost structure. That means you are constantly under pressure to reduce cost.* (General Manager, AC-C, trans.)

While the interviewees in the two HQs were largely satisfied with the level of initiative of their Chinese subsidiaries, at least some of them appeared to be less satisfied with the efforts of the Indian counterparts. Despite their uncompetitive position in the MNE network, the Indian subsidiaries were not perceived to have undertaken appropriate countermeasures. A HQ manager of L-PARENT observed:

> *If I go there and tell them something has to change, then it gets done. But what is missing is a sense for sustainable improvement. It's only ad-hoc activities. [...] We would need very different dynamics there.* (Vice President P, L-PARENT, trans.)

These observations suggest that the increasing BU-internal competition in Asia-Pacific has deprived the Indian subsidiaries of both MNEs from cross-border manufacturing and R&D mandates, but it has not (yet) motivated substantial upgrading initiatives in these subsidiaries.

The Chinese subsidiaries have mainly benefited from Asia-Pacific-wide competition, and have responded to competitive pressures with ambitious upgrading initiatives.
In terms of cross-border *integrated* or *lateral* relations of subsidiaries in Asia-Pacific, only very limited evidence for competitive effects could be observed in the case studies.

Knowledge transfer and support

The case studies demonstrate that communalities in customer requirements, factor conditions, and institutional frameworks of subsidiaries can facilitate horizontal cross-border exchange of knowledge and technology. The potential to acquire sophisticated technologies from sister subsidiaries in neighboring emerging economies might be limited. In fact, in all cases the primary source for new technologies was the HQ or subsidiaries in the developed economies. But as far as emerging-economy-specific skills are concerned (e.g. low-cost designs, handling of poor materials, or dealing with uncertain environments), subsidiaries in neighboring emerging economies were found to constitute valuable sources of knowledge.
The interviewees in the subsidiaries in China and India described their relations with each other and with other emerging economy subsidiaries in Asia-Pacific as open and productive. Barriers to knowledge exchange – as observed in relations with the global HQ – were rare. This was due to the fact that concerns about IP loss were less prevalent here than in relations with the global HQ. The re-organization of both MNEs into global BUs and the efforts of these BUs to foster interaction between the different locations in Asia-Pacific has further induced cross-border knowledge exchange between China and India.
In the case of L-PARENT, L-I has benefited significantly from knowledge exchange with its Chinese counterpart L-C. Relations between the two units were facilitated by the dual role of the technical head of L-C, who was also responsible for technical operations at L-I. In monthly meetings, the two subsidiaries exchanged best practices. If rationalization projects in L-I required expertise from China, task forces of L-C's engineers were sent to L-I or Indian engineers to L-C in China. A good example for this horizontal support is the installation of a sophisticated product line in L-I in 2008. The debugging and ramp-up of this line was supported by a team of engineers of L-C, who spent several months at L-I in India. This support has helped L-I to upgrade its capabilities and master its new production line. Also in the R&D area, L-I and L-C have intensified interaction in recent years. This included joint efforts to adjust global products to emerging economy requirements. By upgrading L-C into the R&D center for Asia, this cooperation is now formalized and is likely to increase further. Knowledge flows between L-C and L-I were rather one-sided, with L-I in India receiving

rather than providing knowledge. But also L-C has benefited from this exchange, for example by adopting (few) low-cost solutions from L-I's plant.

Knowledge exchange between AM-C and AM-I has been more balanced, but the overall intensity has been minor. Owed to its relatively young history, AM-C did not contribute much knowledge to AM-I in India until very recently. The other way around, AM-I was long focused on its domestic market and did not proactively assisted AM-C. Due to the poor track record of AM-I, HQ managers of A-PARENT were also not enthusiastic to use AM-I as a blueprint for the younger subsidiary AM-C. But nevertheless, knowledge exchange between the two units has gradually intensified over the past five years. In contrast to the case of L-PARENT, here also best practices and innovations from India were successfully applied in China. An example for this is a low-cost version of a platform product designed by AM-I for the Indian market. This product was recently adopted by AM-C for the Chinese market. Since 2008, knowledge exchange between the two units has further intensified. This was related to efforts of the global BU to foster horizontal exchange as well as to the increasing sophistication of AM-C's operations. With the newly established Asia-Pacific R&D center in AM-C, knowledge flows between the two units are likely to increase in the future.

Cross-border knowledge exchange between subsidiaries of different BUs in Asia-Pacific could only be observed in few cases. If best practices were exchanged across BU boundaries, this was mostly related to initiatives of the Asia-Pacific HQs, which attempted to collect and distribute best practices among all subsidiaries of the MNE in Asia-Pacific. Some of the subsidiaries, in particular AC-C in Suzhou, have also proactively engaged in direct knowledge exchange with subsidiaries of other BUs. In order to benefit from best practices of these units, AC-C has initiated a MNE-internal benchmarking project and visited several other sites within A-PARENT. But this effort to reach across BU boundaries remained an exception in AC-C and in the case studies in general.

3.6.3 Horizontal relations on the national and regional level

Horizontal relations of subsidiaries in the same host country have been largely ignored in the literature on subsidiary evolution. But in particular with regard to large MNEs in large host countries such as China and India, the existence of multiple MNE subsidiaries per country is not uncommon. The following discussion will take an in-depth look at such relations.

Competition

Competition of sister subsidiaries in the same country might cause subsidiaries to gain or lose mandates and resources. It might also motivate upgrading initiatives of subsidiaries in an attempt to defend their mandates or to venture into the mandates of other units.

L-C in Foshan provides a good example for these mechanisms. L-C has faced competition in China from multiple units of L-PARENT. A nearby site in the Pearl River Delta with experience in electronics has *pulled* the mandate to manufacture and develop certain electronic components from L-C in the early 2000s. When L-PARENT decided to establish a new JV near Shanghai in 2007, L-C was suddenly confronted with an internal competitor in its main business domain: traditional lighting products. The global BU began to distribute the volumes for the national and global market between the two subsidiaries, and L-C consequently lost parts of its share of the business. The role of L-C was further challenged by the trend towards solid-state lighting (SSL) since the mid-2000s. L-PARENT has established a new SSL R&D center in Shenzhen near Foshan, while the manufacturing of most components continues to take place in Germany and Singapore. L-C has captured the mandate to assemble of some SSL products, but has to share the volumes with the JV near Shanghai.

This MNE-internal competition had a strong motivating effect on L-C. Before the internal competition had emerged, the superior cost position of L-C has given rise to complacency among some of its staff. In particular the new JV in Shanghai has challenged this superior position of L-C. With its lean processes and overhead, the JV was able to produce at lower cost, but still in sufficient quality. The technical head of L-C reported:

> *This [internal competition] is motivating us. Some of the colleagues here think they are world champions. And then you tell them: there is another factory that can produce even cheaper. That's a challenge.* (Vice President Technical, L-C, trans.)

The MNE-internal competition has motivated the engineers of L-C to intensify their rationalization and optimization efforts to close the cost gap to the internal competitor.

Also AC-C in Suzhou was confronted with an internal competitor: a JV of A-PARENT with a Chinese partner in Shanghai. The two subsidiaries did not overlap in terms of product mandates. But they held very similar technological capabilities and facilities, and the management on both sides was ambitions to expand or at least defend the scope of their operations. For several new products launched in China, the two subsidiaries were competing with each other for the manufacturing mandate. Over the years, AC-C has lost several mandates to this internal competitor. In a prominent case, AC-C has even lost the mandate to manufacture a product it has developed itself in Suzhou. As in the case of L-C, the internal

competition has encouraged AC-C's engineers to engage in rationalization and optimization efforts in the manufacturing area. But at the same time the interviews revealed that the lack of transparency of certain HQ decisions against AC-C had caused frustration among the subsidiary's staff. The Regional President of AC-C reported:

> *It motivates our people if […] we would compete on technology, costs and quality. [...] Then I think both parties would be happy and energized to do it. But there are sometimes political decisions from the very top management of [A-PARENT], and this is demotivating the team here.* (Regional President E, AC-C)

The other subsidiaries of A-PARENT and L-PARENT did not experience comparable forms of BU-internal competition in their host country.

Horizontal competition on the host country level might also arise between *integrated* subsidiaries with supply chain relations. Underspecified value chain responsibilities and/or entrepreneurship of individual subsidiaries to expand their value-add scope might induce competitive behavior. In the researched cases, however, only limited evidence for such competitive behavior could be observed. In the case of the two integrated subsidiaries AM-C and AC-C in China (the two units maintain supply chain relations for certain components), for example, no evidence for competitive behavior was observed. Both subsidiaries were busy managing their dynamic growth and the rapid expansion of their product portfolio, which has encouraged them to join forces and has left little room to venture into the partner's domain.

Sister subsidiaries in different BUs (*lateral* relations) may not compete for product mandates, but for people, funds, and other resources of the MNE in the host country. Before the re-organization in both MNEs, the national HQs in China and India had a considerable degree of autonomy to decide on the distribution of resources among the country's subsidiaries. Depending on their bargaining power and network capital, some subsidiaries managed to secure a larger share of HQ support than others. AM-I in India, for example, was in a weak position vis-à-vis its larger and more profitable sister subsidiaries in India. In consequence, it did not receive the attention and the investment in upgrading its capabilities it would have required to master its internal and external challenges. This type of competition across BU boundaries has reduced with the re-organization of the MNE into global BUs in the mid-2000s. Since then, internal competition now took place primarily within the BU on the global level and less across BUs. Similar observations were made in the subsidiaries of L-PARENT.

Knowledge transfer and support

In the case studies, horizontal relations of *same-BU* subsidiaries in the same host country were mainly dominated by a competitive spirit. The subsidiaries' motivation to engage in knowledge exchange was therefore limited. However, some of the cases nevertheless provide evidence for knowledge exchange on the national level. The engineers of L-C, for example, engaged in frequent exchange and benchmarking exercises with their internal competitor in China. This exchange was mainly driven by the global BU, but at least partially also by the management of L-C which was eager to narrow the cost gap between the two units. The operations of L-C were more sophisticated than the ones of the internal competitor, which reduced the potential for (technological) spillovers to L-C. But due to the fact that the internal competitor was a JV with a Chinese partner, L-C has nevertheless been able to adopt a set of best practices. A manufacturing manager of L-C reported:

> *Compared with them [the internal competitor] our lines are more automatic and of higher speed. This is of course more expensive. They do it with simple machines, and they do the loading, etc. by hand. In some areas they made very smart, simple solutions. But it works. And this we can learn from them.* (Director MFG, L-C)

An example for such best practices adopted by L-C from its internal competitor is the optimization of the heat insulation in some manufacturing processes. By doing so, the internal competitor had optimized its energy usage and therefore its cost position, while L-C had not paid much attention to this aspect. By implementing this best practice, L-C has benefited from significant cost savings. L-C has also benefited from the internal competitor in the form of market intelligence, in particular with regard to raw material suppliers. By switching to low-cost domestic suppliers identified with the help of the internal competitor, L-C was able to realize considerable cost savings. However, due to the relatively young history of the internal competitor, the learning effects and cost saving potentials have been only of minor importance for the overall evolution path of L-C.

Also in the case of A-PARENT, the sister subsidiaries in China engaged in mutual support and knowledge exchange. While also here relations in the same BU were dominated by competition, knowledge exchange on the working level was described as very productive. As in the case of L-PARENT, the sister subsidiaries exchanged information about domestic component and machinery suppliers, which has helped AC-C to improve its cost position. However, the exchange of technological information between AC-C and the sister subsidiary (a JV with a Chinese partner) was impeded by legal and IP-related concerns. The overall contribution of horizontal exchange to the evolution of AC-C was therefore only minor.

Among *integrated* subsidiaries with supply chain relations, knowledge exchange was a more consensual and productive undertaking than in competitive same-BU relations. The lack of direct competition and the dependence on each other's cost position and performance has motivated these subsidiaries to engage in knowledge exchange and mutual support. The integrated sister subsidiaries AC-C and AM-C, for example, engaged in continuous support efforts. Among other measures, AC-C has established a separate engineering team at AM-C to secure coordination throughout the supply chain. Social ties between the staff of the units (some have worked in both plants) facilitated the cooperation. A manager of AC-C observed:

> *We were growing at the same time like [AM-C]. [...] And of some our contact partners joined at the same time. So we grow our business and network together. This has improved our business every day.* (Director MFG, L-C)

Mutual support of these two subsidiaries has helped them to successfully ramp up their operations and to qualify for additional mandates from the MNE.

Also L-C engaged in knowledge exchange and mutual support with an integrated sister subsidiary in China. But these MNE-internal supply chain relations within China played only a minor role for L-C's overall operations, and the contribution of knowledge exchange in these relations to the evolution of L-C was therefore not very significant.

Also in *lateral* relations with subsidiaries of other BUs, the co-location of sister subsidiaries in the same host country was found to stimulate knowledge exchange and mutual support. In the case of AC-C, for example, a successful benchmarking project with several sister subsidiaries of A-PARENT in China had been implemented few years back. In the course of this exercise, a range of efficiency improvements could be adopted by AC-C. In particular sister subsidiaries operating in different product markets provided valuable best practices. A sister subsidiary in the dynamic consumer products market, for example, had developed unique capabilities in product and customer portfolio management which could be adopted successfully by AC-C. Besides such benchmarking exercises, periodic meetings of the technical communities of the sister subsidiaries of A-PARENT in China were held to foster the exchange of best practices (e.g. regarding production systems or the purchase of new equipment). AC-C managers reported that they have greatly benefited from this exchange. Similarly, AM-C in Changsha has received important support during the ramp-up phase from the subsidiaries of A-PARENT in China. AC-I in Bangalore received similar support from sister subsidiaries in India – some of them with several decades of experience in the country. Among other measures, AC-I has received shared services (e.g. HR) from its sister plant in

Bangalore. In the case of L-PARENT, knowledge flows were rather on-sided. The experience of L-C in Foshan was used to support the ramp-up of new sister subsidiaries in Shanghai and Shenzhen, while L-C itself has not benefited substantially from lateral relations.

The case studies reveal a range of mediating conditions for this kind of lateral knowledge exchange. One of these conditions is the organizational structure of the MNE. With the re-organization of both MNEs into global BUs in the mid-2000s, knowledge exchange on the national level across BUs has decreased. While the national organizations of the MNEs in China and India had traditionally ensured knowledge exchange between subsidiaries in the host country, the re-organization has weakened the national organizations and has shifted this knowledge exchange towards global, BU-internal relations. With this organizational change, the willingness of subsidiaries to cooperate across BUs has decreased. The Marketing Director of AM-I remarked:

> *Before [the re-organization] we did not have this struggle for resources between the different BUs in [A-PARENT India]. But now the targets are set in Germany, and the people follow the global strategy. Before, all business areas had been managed from a central point in India. […] Now the focus is more on global exchange, on learning from the problems of the Chinese or the Brazilians.* (Director Marketing, AM-I, trans.)

Also AC-C in Suzhou has experienced a reduction in cooperation across BUs in the course of the re-organization of the MNE into vertical BUs. A senior manufacturing manager reported:

> *We get only very limited support from [other units in China], because we are a vertical business. And the products are very different. [...] The electronics manufacturing [...] differs significantly from hydraulic and mechanical manufacturing in terms of competences and know-how. Therefore the entire ramp-up here was managed by the [global BU].* (Vice President MFG S, AC-C, trans.)

Besides the relevance of the MNE's organizational setup, the geographic proximity of sister subsidiaries in the host country has also influenced the occurrence of lateral collaboration.

The case of A-PARENT in China demonstrates best how the co-location of sister subsidiaries in a particular region of the host country can facilitate collaboration and mutual support. Several subsidiaries of A-PARENT in the Yangtze River Delta (including AC-C in Suzhou) cooperated successfully in fields such as vocational training and recruiting. The co-location in the same region meant that the subsidiaries could draw on a common labor market and join forces in relations to universities, vocational training institutes, and regional authorities. More distant subsidiaries of A-PARENT, such as AM-C in Changsha, were often excluded from these activities. Due to the large distance to the partner institutes in the Yangtze River Delta, AM-C was forced to establish its own vocational training program instead of making use of the established structures of its sister subsidiaries on the East Coast.

Similarly, the subsidiaries of A-PARENT in Bangalore (including AM-I and AC-I in the outskirts of Bangalore) engaged in frequent exchange of information, services, and staff. Sister subsidiaries in more distant locations in India (e.g. in AM-J in Northern India) were more isolated. For these subsidiaries, face-to-face meetings with sister subsidiaries required time-consuming travel, and the exchange of experienced staff between the plants was impeded by the geographic as well as cultural distance between Northern and Southern India. While it would go too far to relate the sluggish evolution in particular of AM-J in Jaipur to the distance to its sister subsidiaries in India, the interviews suggest that its isolated position in the MNE network in India has been a clear disadvantage for its upgrading endeavors.

Indirect effects

Besides competition and knowledge exchange, the presence of sister subsidiaries in the same host country might generate additional indirect effects. The reputation of sister subsidiaries in the same host country, for example, was found to influence a subsidiary's ability to recruit qualified labor. A HR manager of AC-C, for example, reported that the strong reputation of A-PARENT in China and India – a consequence of the presence of sister subsidiaries in the country for several decades – has helped AC-C to recruit qualified labor also in times when domestic competitors were slowed down by bottlenecks in the regional labor market. Interviews in other subsidiaries confirmed such reputational effects on the labor market.

The reputation of same-country sister subsidiaries was also found to foster sales with customers as well as relations to national or regional authorities. While the magnitude of these indirect effects is difficult to measure with the applied methodology, the case studies clearly suggest that they have facilitated the evolution of the researched subsidiaries.

The presence of sister subsidiaries in the same host country was also found to influence the expectations of existing and prospective staff. Especially if located in the same region of the host country, employees and/or unions are typically aware of wages and benefits in the sister subsidiaries. If there is a gap between sister subsidiaries in this respect, the unions will likely push for an alignment. The experience of AM-I in India illustrates this mechanism. For several decades, a sister subsidiary of AM-I in Bangalore has operated in a strong competitive position in the domestic market. In this comfortable situation, it has granted its staff a substantial premium on average wages in the region. The competitive situation of AM-I, which faced fierce cost competition with domestic firms, was much less comfortable. But nevertheless, AM-I's labor union pushed for an alignment of wages between AM-I and the high-wage sister. In consequence, AM-I's competitive position vis-à-vis its domestic

competitors further deteriorated. This negative externality from its sister subsidiary has contributed to the outsourcing of substantial parts of AM-I's value-add to external firms.

Another example for such an indirect horizontal effect could be observed in two additional Chinese subsidiaries of A-PARENT in Hangzhou, Zhejiang Province. When the labor union in one of these subsidiaries pushed for a significant wage increase, the other subsidiary was forced to follow suit to maintain stability among its workforce. The Managing Director of the latter subsidiary reported that they had already been paying significantly above market average before the recent wage increase. After this increase, the competitive position of the subsidiary in the domestic market has further deteriorated.

The case of L-C provides a similar example for this mechanism, although in the opposite direction: a new sister subsidiary near Shanghai – an internal competitor to L-C – was forced to align its wage structure to the higher levels of L-C. The sister subsidiary has therefore lost some of its cost competitiveness in the domestic market and vis-à-vis L-C.

Subsidiary	**Location**	**Global** Competition	**Global** Support	**Asia-Pacific** Competition	**Asia-Pacific** Support	**National** Competition	**National** Support
L-I	NCR (Delhi/Sonepat)	◑	◕	○	●	◑	◑
AM-I	Karnataka (Bangalore)	◑	◕	○	●	◔	◕
AC-I	Karnataka (Bangalore)	◑	◑	◑	●	◑	◕
L-C	Pearl River Delta (Foshan)	◕	●	◕	◕	◔	●
AM-C	Hunan Prov. (Changsha)	◑	◕	◕	◑	◑	●
AC-C	Yangtze River Delta (Suzhou)	◑	●	◑	◑	◔	●

○ Strongly impeding ◔ Impeding ◑ Neutral ◕ Supportive ● Very supportive

Table 6: Impact of horizontal relations on subsidiary evolution[23]

Source: Table provided by author.

3.7 Conclusion

The aim of this chapter was to analyze the drivers and underlying mechanisms of subsidiary evolution in the MNE-internal environment. Recognizing the complexity of this environment, a fine-grained conceptual framework has been developed. On the subsidiary level, this approach incorporates the capabilities, initiatives, and path-dependent mechanisms in the *black box* MNE subsidiary. In vertical relations, it distinguishes between corporate and BU strategies on different geographic levels. And in horizontal relations, it distinguishes between

[23] Qualitative assessment based on case study analysis. The table indicates the *direction* of impact (not the magnitude) of competition and cooperation in horizontal relations on the evolution of the researched subsidiaries.

different mechanisms of collaboration and competition in same-BU, integrated, and lateral relations on different geographic levels.

Applied to six case studies in China and India, this multi-level framework revealed a range of mechanisms underlying subsidiary evolution. In particular proactive support in vertical relations with the global HQ was shown to drive the evolution of a subsidiary's capabilities and operations – both by assigning formal roles and responsibilities and by enabling the a subsidiary to fulfill these roles. The delegation of expatriate managers was identified as a particularly important mechanism of HQ support. In both MNEs, it was shown that the level of HQ support has differed significantly over time as well as between different locations. The unequal allocation of HQ support to subsidiaries in the two host countries was shown to have contributed to (but not determined) the different evolution paths in the case studies. Among other factors, this unequal allocation was owed to MNE strategy and organization, opportunities in the host markets, contributions of the subsidiaries to the MNE, and social relations between HQ and subsidiary staff.

The transfer of knowledge and technology and the tolerance of subsidiary-level initiatives by corporate and BU HQs were shown to be closely related to concerns about the dissemination of proprietary knowledge. Fluctuation of subsidiary staff and weak IP protection in the host countries (in particular in China) were fueling these concerns. Organizational inertia and ethnocentric attitudes further added to HQ resistance to subsidiary upgrading. The impact of this resistance on subsidiary evolution, however, was found to differ with the requirements of the subsidiaries. While barriers to knowledge and technology transfer slowed down the most (technologically) sophisticated subsidiaries in China (L-C and AC-C), it was not found to have affected the evolution of the less sophisticated subsidiaries in India.

Besides this prominent role of the HQ, the findings emphasize the relevance of horizontal competition and collaboration in the MNE-internal network on different geographic and organizational levels. Competition between sister subsidiaries was found to occur mainly within and less across business units of the MNE. While competition for product mandates with plants in the developed economies was found to motivate initiatives to improve quality and delivery, competition with other emerging economies or even within the same host country was found to motivate primarily cost optimization efforts. However, the subsidiaries' responses to MNE-internal competitive pressures differed between China and India in both MNEs. For the Indian subsidiaries, the internal competition with China (and also with other emerging economies) has also resulted in the loss of some existing (and prospective) mandates, which emphasizes the interelatedness of the up- and downgrading trajectories of

subsidiaries in the MNE network. However, the upgrading of the Chinese subsidiaries, for instance, did not necessarily cause a downgrading of subsidiaries in neighboring locations. Through horizontal knowledge exchange the weaker subsidiaries in the MNE network could benefit from the upgrading of advanced sister subsidiaries. The Indian subsidiaries, for example, were shown to have benefited from knowledge exchange with their (technologically advanced) Chinese counterparts. For the subsidiaries in China, in contrast, horizontal exchange has concentrated mainly on sister subsidiaries in the developed economies. Organizational changes in both MNEs were shown to have encouraged collaboration between sister subsidiaries in recent years, and the case studies suggest that it might further increase rather than decline in the future. In the researched time period, however, the findings suggest that horizontal collaboration and competition has been only of minor importance for the subsidiaries' evolution when compared to the dominating role of HQ-subsidiary relations.

Subsidiary evolution drivers were also identified on the subsidiary-endogenous level. The entry mode and the associated legacy of a subsidiary was shown to influence the initial years of a subsidiary, but less so its evolution in the mid- to long-term, as entry mode effects get leveled out soon by a range of other factors. In line with recent studies on MNE subsidiaries (see e.g. MARIN and GIULIANI 2007, GARCIA-PONT et al. 2009), the case studies found that subsidiaries are not mere recipients of knowledge and mandates from the HQ, but might in fact play an active role in their evolution over time. Subsidiary-level initiatives were shown to constitute an important explanatory factor for the differences between the observed evolution paths. Through lobbying efforts as well as a strong MNE-internal track record related to quality and productivity optimization efforts, the Chinese subsidiaries of both MNEs were shown to have contributed considerably to the upgrading of their operations, while the two older Indian units have remained rather passive in this regard.

The accumulation of localized capabilities was also shown to have contributed to the observed evolution paths. In particular the two older Chinese subsidiaries have successfully upgraded their capability stock over time with the help of external knowledge. This upgrading has attracted increasingly sophisticated tasks from their HQs – suggesting a *virtuous cycle* of capability upgrading and the assignment of advanced mandates. However, capability upgrading has mainly followed the requirements of current mandates rather than ambitious to expand these mandate. A *subsidiary-capability-driven* evolution in the sense of BIRKINSHAW and HOOD (1998) was therefore not observed.

With this comprehensive investigation of MNE-internal drivers and mechanisms, this chapter contributes to the literature on the microfoundations of subsidiary evolution. It demonstrates

that the evolution of MNE subsidiaries cannot be analyzed with a simplified concept of the MNE as a monolithic, HQ-centric unit, and that research should pay close attention to configurations and relations on the subsidiary level and the differentiated and interactive nature of an MNE's network of subsidiaries. The case studies suggest a trend towards a multi-center and self-reinforcing network of knowledge generating subsidiaries. However, this trend still appears to be far from replacing the HQ in the home market as the central knowledge hub in the MNE network. This might be particularly true with regard to subsidiaries in emerging economies with weak external knowledge bases.

4 Drivers in the external environment

4.1 Introduction

Subsidiaries in emerging economies such as China and India play an important *dual role* in MNE-internal and -external environment. Firstly, such subsidiaries might offer the MNE access to dynamic markets and location-specific assets. And secondly, MNE subsidiaries might contribute to economic development in emerging economies by offering access to capital, extra-territorial knowledge, and global value chains. However, the potential for such beneficial internal and external contributions of a subsidiary depends on the evolution of its capabilities and operations. While some subsidiaries create unique capabilities and emerge as global centers of excellence in their MNE, others stagnate or even cease to exist. For both MNE management as well as policymakers in emerging economies, it is therefore critical to understand why and how subsidiaries in dynamic environments evolve over time.

Research on MNE subsidiaries in International Business (IB)/Strategic Management has identified multiple drivers on the subsidiary-endogenous level as well as the MNE-internal and -external environment (BIRKINSHAW and HOOD 1998, DOERRENBAECHER and GAMMELGAARD 2006, PHENE and ALMEIDA 2008). With the rapid growth of emerging economies such as China and India, in particular the relevance of the external dimension has increased in recent years (MEYER et al. 2011). Despite projections for a global homogenization of cultural and institutional environments in the course of globalization and economic development, scholars and practitioners have increasingly recognized that knowledge *about* and embeddedness *in* these differentiated environments remain a key success factor for MNE operations (MEYER et al. 2011). In the light of these challenges for the MNE, "*[…] the environment is increasingly seen as an important and under-researched contingency*" (ASMUSSEN et al. 2009: 44). Along similar lines, ANDERSSON et al. 2007 argue that "*[…] the environment in which subsidiaries conduct their business has been considered in a rather sweeping fashion. […] only limited consideration has been given to obtaining a more precise determination of how the local environment can constitute a power base for the subsidiary*" (ANDERSSON et al. 2007: 803).

While most literature on subsidiary evolution incorporates the environment in the form of context configurations, it overlooks that an important part of a subsidiary's external context might consist of linkages to specific counterparts rather than to an anonymous market (FORSGREN et al. 1999, ANDERSSON et al. 2007). And instead of treating the host country

as a monolithic environment, IB/Strategy could benefit from taking a sub-national approach and consider more explicitly the role of space and place in subsidiary evolution.

Concepts and empirical evidence in Economic Geography can complement the underdeveloped notion of geography and the sub-national host environment in IB/Strategy with a focus on location-bound advantages of MNE subsidiaries such as mechanisms of localized learning on the national and regional level (MASKELL and MALMBERG 1999, BATHELT et al. 2004). However, the MNE-internal processes facilitating subsidiary evolution (e.g. mechanisms underlying the effective use of location-bound advantages by subsidiaries and MNEs) are often treated as a *black box*, and the external drivers of MNE subsidiary evolution therefore remain unclear in this literature.

These observations suggest that both IB/Strategy and Economic Geography could benefit from an in-depth approach to the drivers of MNE subsidiary evolution in the host environment. Consequently, this chapter attempts to contribute to the literature in two ways: Firstly, it develops a conceptual framework of subsidiary evolution incorporating the complexity of a subsidiary's external environment. Secondly, it applies this framework to six MNE subsidiaries in China and India in order to investigate the underlying drivers and mechanisms of subsidiary evolution in these dynamic environments.

The remainder of this chapter is arranged as follows: The next section provides a review of relevant literature. Building on this review, a conceptual framework is presented. Then the findings from the case studies regarding external drivers of subsidiary evolution are discussed. The chapter is concluded by a discussion of key findings.

4.2 Literature review

Subsidiary management faces the challenge to balance the *dual-* or even *multiple-embeddedness* of its organization in different environments. In the MNE-internal environment the subsidiary faces pressure to integrate its operations and knowledge with the HQ and various sister subsidiaries. In the host environment, the subsidiary faces pressure to embed itself into the national and regional context in order to absorb localized capabilities and realize market opportunities. Owed to this multiple-embeddedness, an analysis of external drivers of subsidiary evolution should consider both the processes in the interface of a subsidiary to the external environment as well as MNE-internal processes. Consequently, this chapter applies a multi-disciplinary approach and draws on insights from International Business (IB)/Strategic Management as well as Economic Geography.

The concept of the MNE as a *differentiated network* in IB/Strategy literature suggests that the very advantage of the MNE is its ability to access unique capabilities of geographically dispersed subsidiaries and distribute and combine them in the MNE network (GHOSHAL and NOHRIA 1997). Underlying this concept is the idea that the MNE's resources (PENROSE 1959), dynamic capabilities (TEEECE et al. 1997), and knowledge (KOGUT and ZANDER 1993) constitute the source of its competitive advantage. The growing awareness of the uniqueness of MNE subsidiaries has motivated some IB/Strategy researchers to shift attention from the MNE to the subsidiary level as the unit of analysis and towards understanding the roles played by subsidiaries, the reasons for variations between them, and their evolution over time (BIRKINSHAW and HOOD 1998, RUGMAN et al. 2011). Although most of these studies focus on MNE-internal mechanisms, the external conditions underlying subsidiary evolution have also received considerable research attention. *On the global level*, such external conditions include political, regulatory, and technological developments as well as the competitive structure of the industry. BENITO et al. (2003), for example, show that economic governance on the national and supra-national level has facilitated the transfer of capabilities and operations from MNE HQs to their subsidiaries in the Nordic countries. And EGERAAT and BREATHNACH (2008) show how changes in supra-national regulations in the pharmaceutical industry have induced the upgrading of MNE subsidiaries in Ireland.

On the national (host country) level, potential drivers of subsidiary evolution include competition, demand requirements, supply and factor conditions, institutions, and the size of the market. In line with PORTER's (1985, 1990) work on competitive strategy and the stimulating effect of challenging environments on innovative efforts of firms, several studies on subsidiary evolution show that sophisticated customers and competitors in the host environment encourage subsidiary-level initiative to upgrade operations and mandates (see e.g. BORINI et al. 2009). However, other studies are less clear about the impact of competition on subsidiary evolution – in particular with regard to the upgrading of R&D activities (see e.g. DAVIS and MEYER 2004). In terms of labor cost and qualification, DOERRENBAECHER and GAMMELGAARD (2006) show that the availability of skilled labor induces the upgrading of capabilities and operations of a subsidiary, while rising labor costs might discourage further MNE investment in a particular subsidiary. In terms of national and regional policy, EGERAAT and BREATHNACH (2008) show how favorable tax regimes in Ireland have induced an MNE-led upgrading of subsidiaries in this country. Similarly, DOERRENBAECHER and GAMMELGAARD (2006) find that liberal investment regimes and subsidies in Hungary have induced an upgrading of MNE subsidiaries there. And

DAVIS and MEYER (2004) demonstrate how national policy and strong scientific institutions have induced the upgrading of R&D activities in MNE subsidiaries in several Western European countries.

Drivers on the *sub-national or regional level* have not received much attention in the literature on subsidiary evolution - or have at least not been recognized explicitly as *regional*. Potential drivers discussed in the literature include regional configurations such as the labor market, city and provincial policies, physical infrastructure, and schools and universities. DOERRENBAECHER and GAMMELGAARD (2006), for example, find that regional policies and institutions (e.g. subsidies or permission to build in residential areas) have played an important role for the evolution of MNE subsidiaries in Hungary. And DE BEULE et al. (2005) show how provincial economic policy has accelerated the localization and upgrading of operations of MNE subsidiaries in Guangdong province, China.

Despite this rich body of research on subsidiary evolution, it is argued in this dissertation that the literature still falls short to capture the full complexity of the interplay of MNE subsidiaries with the external environment. First and foremost, this is owed to the MNE-centric view in most of this literature. According to HEIDENREICH and MATTES (2010), "*the analytical focus in the international business literature has been the internal complexity of MNCs and the different coordination and configurations patterns, but not on the multifariousness of the external environment which in fact adds another level of complexity to these companies*" (HEIDENREICH and MATTES 2010: 4). While most studies on subsidiary evolution incorporate host country configurations into the analysis, the external dimension has received insufficient research attention, and underlying mechanisms are not fully understood.

Secondly, despite several conceptual attempts to capture the complexity of the external environment on different geographic levels (see TAVARES 2001), hardly any empirical study has applied such a multi-level framework to an in-depth analysis of MNE subsidiaries. Moreover, the mechanisms of how exactly the external environment impacts the MNE subsidiary (e.g. directly on the subsidiary level and more indirectly via the HQ) have not received sufficient research attention.

Thirdly, most studies on subsidiary evolution limit the scope of the analysis to context configurations and neglect the *relational* dimension of a subsidiary's external embeddedness as a potential driver of subsidiary evolution (ANDERSSON et al. 2007). Moreover, a *spatial* view on the interplay of the subsidiary and its host environment (e.g. agglomeration dynamics and geographic proximity) is almost entirely missing in the literature on subsidiary evolution.

Fourthly, many studies on subsidiary evolution operate with insufficient data. Most firm-level studies are based on data from the focal subsidiaries (DOERRENBAECHER and GAMMELGAARD 2006, KOKKO and KRAVTSOVA 2008). However, an assessment of external drivers – in particular of linkages to external partners – would require data also from external partners. Furthermore, most in-depth studies are limited to a single host country, which impedes the isolation of national and regional particularities.

And finally, the literature on subsidiary evolution does not yet sufficiently appreciate the growing importance of emerging economies as host environments for MNE subsidiaries. While studies on MNE activity in emerging economies have proliferated recently, only very limited attention is paid to emerging-economy-specific trajectories and drivers of subsidiary evolution. And while several studies focus on MNE subsidiaries in China (see e.g. DE BEULE et al. 2005), very little attention is paid to subsidiaries in its South-Asian neighbor India despite the increasingly prominent role of this country on the corporate agenda.

In recent years, literature on *Inter-firm*/*Business Networks* has proliferated (see e.g. ANDERSSON et al. 2007, PHENE and ALMEIDA 2008). This literature aims at extending the analysis of the MNE and its subsidiaries to their external network beyond hierarchical boundaries. It applies prior works on social networks to inter-firm alliances and focuses on the embeddedness of inter-firm relations and the associated advantages for knowledge exchange, learning, and innovation (FORSGREN et al. 1999, ANDERSSON et al. 2007). This perspective on the external network of the MNE can complement the MNE-centric view on subsidiary evolution in most of the IB/Strategy literature. Recent studies in this literature demonstrate that a subsidiary's linkages to external partners in the host environment can strengthen its capabilities and motivation to pursue upgrading initiatives (PHENE and ALMEIDA 2008, ASMUSSEN et al. 2009). ANDERSSON et al. (2007) show that learning in external networks does not only strengthen a subsidiary's capabilities, but also its MNE-internal bargaining power. And MARIN and GIULIANI (2007) show that embedded external networks can support the generation of innovative capabilities in MNE subsidiaries, but only in combination with sufficient levels of MNE-internal integration.

As argued above, the role of location and geography has not received sufficient attention in the literature on subsidiary evolution and more generally in IB/Strategy (BEUGELSDIJK et al. 2010). Economic Geography literature with its focus on spatial, relational, and institutional factors influencing the (innovative) performance of firms, regions, and countries might

therefore provide a complementary perspective to the analysis. It is now broadly recognized in IB/Strategy that localized capabilities in a subsidiary's host environment can contribute to the MNE's competitive advantage. But how exactly a subsidiary can absorb, apply, and diffuse such localized knowledge remains an under-researched contingency (ASMUSSEN et al. 2009). Economic Geography scholars understand inter-firm learning as an interactive and spatial process facilitated by face-to-face interaction and different types of proximity between actors (BOSCHMA 2005, MALMBERG and MASKELL 2006). (Tacit) knowledge and capabilities often stick to particular locations, implying that "*[…] it is necessary for MNC's 'to be there' in order to make use of this localized knowledge*" (REVILLA DIEZ and BERGER 2005: 1815, emphasis in the original). The conceptualization of the national and regional economic space as complex *Innovation Systems* of interacting and competing firms and institutions (see e.g. LUNDVALL 1992) emphasizes a range of factors influencing the evolution of MNE subsidiaries. This includes policy (e.g. local content requirements and subsidies) and public goods (e.g. education and infrastructure) as well as a range of agglomerations effects related to the co-location of firms (COOKE 2001).

Studies on innovation systems in emerging economies highlight the heavy dependence of these locations on extra-territorial knowledge, the weakness of their institutions, and their heterogeneous economic structure which may impede agglomeration economies (ERNST and KIM 2002, BERGER and REVILLA DIEZ 2008). This provokes the question if and how host environments such as China and India can induce an upgrading of subsidiaries of developed-country MNEs. In most of the Economic Geography literature, however, the absorption of localized advantages by MNE subsidiaries and the MNE-internal processes on the national and global level shaping subsidiary evolution are treated as a *black box* (YEUNG 2006).

This literature review suggests that both the firm-centric IB/Strategy literature and literature with a more spatial focus on economic activity would benefit from in-depth research on how exactly external configurations and relations influences the evolution of MNE subsidiaries.

4.3 Conceptual framework

In order to capture the complexity of external drivers of subsidiary evolution highlighted in the literature review, a conceptual framework based on BIRKINSHAW and HOOD (1998) and TAVARES (2001) was developed. But in contrast to these holistic frameworks, the focus here lies on subsidiary evolution drivers in the external environment. Instead of listing a range

of *environmental determinants* of subsidiary evolution (see BIRKINSHAW and HOOD 1998), the proposed framework follows a process-oriented approach and conceptualizes external evolution drivers in two ways: Firstly, external drivers might manipulate HQ-level strategy and actions and motivate or restrict an HQ-driven evolution of subsidiary operations (e.g. by offering access to strategic assets). Secondly, external drivers might encourage, enable, or impede a subsidiary-driven evolution trajectory (e.g. by fostering its capabilities). Such a process-oriented approach draws attention away from a mere discussion of the business environment towards *how* the environment actually interacts with the MNE.

An important part of a subsidiary's external context consists of linkages to specific counterparts rather than to an anonymous market (FORSGREN 1999). Consequently, the framework distinguishes external drivers in context configurations (e.g. economic policy) and linkages to specific counterparts (e.g. suppliers). Context configurations are further disentangled in geographical terms in drivers on the regional, national, *macro-regional* (e.g. Asia-Pacific), and global level. Such a distinction is useful as the different geographic levels can be assumed to contribute different impetuses to subsidiary evolution.

The impact of external configurations and linkages on the subsidiary is mediated by a range of MNE-internal conditions. On the level of the subsidiary, such conditions include the initiative and absorptive capacity of the subsidiary's employees (PHENE and ALMEIDA 2008). And in HQ-subsidiary relations, such conditions include MNE strategy and organization as well as the interdependence of the HQ and the subsidiary (ANDERSSON et al. 2007).

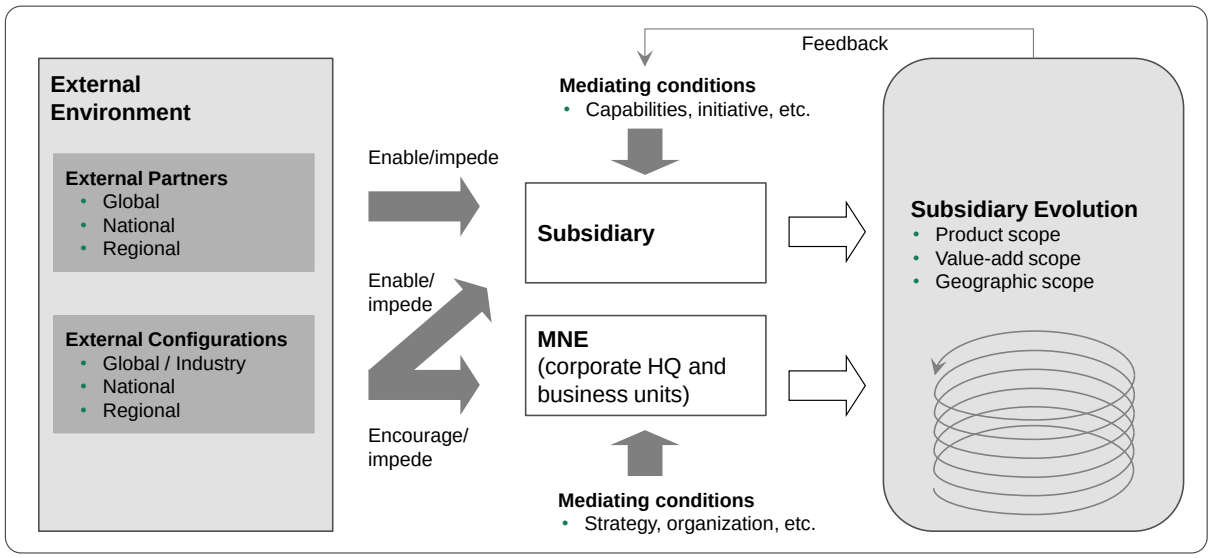

Figure 11: Framework of evolution drivers in the external environment

Source: Figure provided by author.

In the following, these conceptual considerations will be applied to the analysis of six MNE subsidiaries in China and India in order to investigate how the external environment has affected the evolution of their operations over time. The discussion will distinguish between indirect impact of the environment through the MNE HQ and direct impact on the subsidiary.

4.4 Indirect impact of the environment through the HQ

Configurations of the external environment on the global, national, and regional level influence decisions of the MNE HQ regarding the up- or downgrading of subsidiaries in the MNE network. However, the impact of such configurations on the HQ is mediated by a range of conditions in the MNE-internal environment. In the following, case study evidence for such external configurations and mediating conditions in the case studies will be presented.

4.4.1 Global level

According to TAVARES (2001), "*the external environment driver […] transcends the host country/local environment. […] The most relevant environmental influences need not even by local. For most major MNEs, global factors may dictate […] the fate of the national subsidiary and may limit/enhance its evolutionary ambitions*" (TAVARES 2011: 144). Among these global factors is the shift in economic activity to the emerging economies. For more than a decade now, strategies to succeed in emerging economies such as China and India have been prominent on the corporate agenda (BRUCHE 2009). These locations differ from developed economies in terms of growth dynamics, competitive structure, and consumer preferences. Consequently, many MNEs have designed dedicated strategies (and organizations) to manage these differences. In the mid-2000s, L-PARENT has formulated an ambitious *BRIC-strategy* to increase its share of sales, output, and sourcing in emerging BRIC economies. While this strategy was mainly targeted at China, India has also increasingly come into focus. Around the same time, A-PARENT has developed a similar strategy. The consequences of this strategic *shift to Asia* were felt by the researched subsidiaries in the form of ambitious growth targets, tighter integration into the MNE network, and proactive support from the HQ. The establishment of AM-C and AC-C in China and their rapid, HQ-driven upgrading was a direct result of the new MNE strategy. Likewise AM-I in India and the subsidiaries of L-PARENT have received more HQ attention and support in the course of the strategic shift to the BRIC-countries.

The manufacturing head of L-I in India remarked:

> *The complete equation has changed worldwide. Growth is not in Europe. Growth is not in [the] US. Growth is in [the] BRIC-countries. [...] And now they [the HQ] are more willing to listen.* (Vice President MFG, L-I)

The fact that the recent global financial and economic crisis has hit the MNE's home markets more severely than China and India has further reinforced the strategic shift of the two MNE HQs towards their subsidiaries in these locations.

Besides such trends in the global economy, industry characteristics and technological trends have played an important role in determining the strategies and actions of the two MNE HQs towards their subsidiaries. In the automotive supply industry, components are typically manufactured in close proximity to final assembly and the market. The need for flexibility to react to changing customer requirements and ambition to reduce transportation and storage costs motivate this location behavior. Quality plays a central role in automotive, as small defects can cause significant financial and reputational damage. In contrast, firms in the lighting industry face less rigorous quality requirements and – at least in the market for commoditized products – do not necessarily need to co-locate with customers and suppliers. Export-seeking mandates are therefore more common in lighting than in automotive. In fact, certain commoditized products are almost entirely produced in China for the world market. Mainly due to these industry characteristics, the subsidiaries of A-PARENT were almost exclusively focused on the domestic market, while L-PARENT leveraged its subsidiaries (at least the ones in China) also as export hubs for the world market. However, MNE strategy and subsidiary roles are likely to evolve over time along changing industry characteristics. In automotive supply, for example, the gradual globalization of OEM customers put increasing pressure on A-PARENT to align its dispersed subsidiaries to standardized products and processes. This alignment has generated opportunities for domestically-oriented subsidiaries such as AM-I in India to export to the world market. But until today, the *local-for-local* manufacturing paradigm of A-PARENT has largely remained in place.

Technological change in the two industries has influenced the strategies and actions of the two MNE HQs towards their subsidiaries. In particular the lighting industry has experienced substantial technological change in recent years. The first change was the shift from traditional incandescent lamps to energy-saving fluorescent lamps. While this trend was still underway, a new technology has already gained momentum: solid-state lighting (SSL). The evolution of L-C in China has benefited from the first trend towards fluorescent lighting. Right from the start, its product portfolio consisted mainly of fluorescent lamps. With the

global trend towards this technology, the export activity of L-C to the world market grew constantly, while the traditional incandescent lamp plants in Europe and North America were drastically losing volumes. As one of the leading plants in L-PARENT for fluorescent lighting, L-C has received considerable HQ support to upgrade its operations and capabilities over time. The recent trend towards SSL lighting, however, threatens L-C's strong position in the MNE. SSL poses fundamentally different technological challenges to manufacturers. Consequently, development and production of high value-add components in SSL were located in the technology centers in Germany or Penang, Malaysia. A new development center was established in Shenzhen, an emerging cluster for SSL near L-C. L-C has so far only secured a basic assembly line. It remains to be seen whether L-C can defend its MNE-internal role and its share of the MNE's resources and mandates in this new technology.

L-I in India was focused entirely on the domestic market, which has been comparably slow to adopt new technologies. Only since very recently energy-saving and SSL products have gained momentum in India. L-I was therefore less affected by global technological trends.

The automotive (supply) industry has also experienced changing technological paradigms and customer preferences over the past two decades. The rapid growth of demand in the emerging economies, together with the trend towards fuel efficiency in the developed economies, has directed the focus of automotive OEMs away from top-end performance towards cost-efficient and highly functional vehicles. This trend has required automotive suppliers to design lighter, cheaper, and simpler products. Recognizing that its engineers in Germany cannot simultaneously operate at the technological frontier focusing on high-end cars and achieve significant cost reductions in the low-end segment, A-PARENT decided to decentralize product development and delegate more responsibility to the emerging economies. This trend is illustrated by the establishment of a new R&D center for low-cost platforms in AM-C in Changsha in 2009 and the delegation of additional R&D responsibilities to AC-C in Suzhou in recent years.

These industry trends were driven or accompanied by regulatory changes in the developed economies. The trend towards energy-saving products in the lighting industry, for example, was fueled by the ban of traditional incandescent bulbs in the European Union (EU). Similarly, regulatory changes in the developed economies (e.g. tighter emission norms) have contributed to the trend towards low-cost and efficient vehicles in the automotive industry. Despite recent efforts in China and India to tighten environmental regulation, the regulatory gap between the developed and emerging economies has widened rather than narrowed in recent years (SANDERSON et al. 2008). This widening of the regulatory gap – and the

associated differentiation of product characteristics for the different markets – has increasingly overstretched the centralized R&D capacities of the two MNEs and has encouraged the transfer of R&D responsibilities to the subsidiaries in China in India.

Subsidiary	Industry	Global Economy	Industry trends	Regulatory trends
L-I	Lighting			
AM-I	Automotive supply (mechanical)			
AC-I	Automotive supply (electronic)			
L-C	Lighting			
AM-C	Automotive supply (mechanical)			
AC-C	Automotive supply (electronic)			

Table 7: Impact of global configurations on HQ-driven subsidiary evolution[24]

Source: Table provided by author.

4.4.2 National level

The case studies demonstrate that the strategies of the MNE HQs towards their subsidiaries are sensitive to configurations on the national level of the respective host countries. Important configurations in the case studies include the size and growth of the domestic market, factor conditions, suppliers, and policy.

Size and growth of the domestic market

The Chinese and Indian subsidiaries of the two MNEs were mainly focused on capturing growth opportunities in the domestic markets. In the past decade, the Chinese market has emerged as a major growth driver in both MNEs. The recent financial and economic crisis in Europe and North America has further reinforced the strategic relevance of the Chinese market. The Indian market has long been regarded as peripheral by both MNEs with its high-growth, but limited volumes. Although sales of both MNEs in India have grown dynamically in recent years, they still amount to only a fraction of sales in China (factor five to ten depending on the subsidiary and product family). This (partially) explains why both MNEs have focused considerably more attention and resources on their subsidiaries in China than on

[24] Qualitative assessment based on case study analysis. The table illustrates how certain global configurations have affected the evolution of the researched subsidiaries by manipulating HQ-level strategies and decisions.

the ones in India (see also *chapter 3*). With the vast size of its domestic market, China was the natural choice for many product line transfers and emerging-economy-specific R&D mandates. In the case of AM-C, for example, the large size of the Chinese market has attracted a new R&D center for low-cost platforms. A R&D manager in the HQ reported:

> *We decided to create our second hub for platform development in China. China has by far the largest market. With its four to five million vehicles India is small in comparison.* (Director Engineering, A-PARENT, trans.)

The other case studies in China confirm the observation that a large domestic market can attract additional investment and mandates to a subsidiary.

The size of the Chinese and Indian market – and therefore also their attractiveness for the two MNEs – has evolved over the lifetime of the subsidiaries. China has not always played a central role in MNE strategy. When the pioneering Chinese subsidiary L-C was established back in the 1990s, it has not received sufficient HQ attention and support. The founding director of L-C reported that this lack of attention on the Chinese market – together with the ethnocentric attitude and organizational inertia in the HQ – has slowed down the evolution of this subsidiary in the early phase. In contrast, the late movers in China (AC-C and AM-C) have enjoyed strong HQ attention and support right from the start when they were established during the boom of the Chinese market in the mid-2000s. Similarly, the two older Indian subsidiaries (L-I and AM-I) did not receive considerable HQ attention when they were established in the peripheral Indian market of the 1990s. In contrast, the late mover in India (AC-I), which was established in the booming Indian market in 2009, has received strong HQ support (e.g. expatriate managers and latest technologies) right from the beginning. These findings illustrate that the strategic behavior of the MNE HQs has evolved along the increasing relevance of the markets in these locations.

Labor market in the host country

Despite being located in some of the high-cost regions of the respective host countries (e.g. the Pearl River and Yangtze River Delta in China or the Bangalore and Delhi region in India), labor cost arbitrage was still attractive from the perspective of the two developed-country MNEs. In both MNE HQs, the availability of cost-efficient labor in China and India has encouraged the localization of manufacturing and R&D in order to compete in the domestic markets. The availability of cost-efficient labor has therefore induced the upgrading of the product and value-add scope of the researched subsidiaries. In some cases, cost-efficient labor has also motivated the MNE HQs to assign export mandates to the subsidiaries. In particular

L-C, the only *Rationalized Manufacturer* in the case sample with significant exports, has benefited from cost-efficient labor relative to MNE-internal competitors. The other researched subsidiaries have so far failed to expand the geographic scope of their operations. Among other reasons, this was due to the fact that labor costs constitute only a fraction of total costs in both industries. The CEO of L-I in Delhi, for example, reported:

> *Our product is mechanized production. So labor cost does not play a major role here. Labor cost is typically only eight to twelve percent of total cost of the product. In our case sometimes even lower. So it does not play a major role*. (CEO, L-I)

The same is true for the automotive industry, where factors other than labor costs (e.g. raw material costs and supply chain efficiencies) determine global manufacturing strategies (STURGEON and BIESEBROECK 2010). The role of labor cost for the evolution of the MNE subsidiaries in these industries should therefore not be overstated.

The availability of cost-efficient labor was also found to attract mandates in process and product development. A-PARENT has increasingly leveraged AC-C in Suzhou as a low-cost location for the process development for its global product launches. Similarly, the subsidiary of L-PARENT in the US has leveraged the R&D center of L-I in Delhi as a low-cost offshore unit. But despite these and other examples in the case studies, labor cost arbitrage has not played a crucial role for the overall evolution of the subsidiaries' R&D scope.

Another determinant of subsidiary evolution related to the labor market is the MNE's perception of the host countries' work and innovation culture. The interviews in the HQs revealed ethnocentric attitudes in particular with regard to innovative capabilities in China and India. *The Chinese* (and also *the Indians*) were not believed to be able to undertake product innovation beyond incremental modifications. A quality manager of A-PARENT, for example, argued:

> *The Chinese are good at copying things and at offering them in comparable or better quality at lower cost. [...] But I never got to impression that they were eager to innovate, to create something new.* (Manager Global Quality, L-PARENT, trans.)

Similar comments were made by other interviewees in A-PARENT and L-PARENT. Regardless of the validity of this assessment of the domestic innovation culture in China (and India), the lack of confidence of HQ managers in the merits of innovation in these locations appears to have slowed down the upgrading of R&D operations in the subsidiaries. This has mainly affected the two sophisticated subsidiaries L-C and AC-C in China.

Besides obvious differences in the working cultures of the developed and emerging economies, the interviewees also observed differences between China and India – in particular with regard to the level of initiative of the workforces in these locations. A manufacturing manager of L-PARENT, for example, observed:

> *Sometimes I get the feeling that they [L-I] do not care whether they keep the plant, it gets expanded or terminated. [...] It is related to their mentality. [...] It seems that they can also arrange themselves with the next life, whereas the Chinese live here and now and would do anything for money and career.* (Vice President C, L-PARENT, trans.)

The analysis of the cases studies suggests that such differences in the attitudes of subsidiary managers in China and India have contributed to the differences in the subsidiaries' evolution paths. However, the methodology and data does not allow for an accurate assessment of *how much* of this effect was actually owed to cultural characteristics of the respective locations and *how much* was merely owed to chance (i.e. the selection of individuals in charge). Moreover, it is difficult to isolate the influence of expatriate (mostly German) managers in the subsidiaries from the influence of the actual *domestic culture* in the subsidiaries' workforce. But regardless of these analytical limitations, the evidence from the case studies clearly suggest that mere perception in both MNEs that subsidiary managers in India were not always *trying hard enough* has discouraged HQ managers to invest in the Indian subsidiaries, and has therefore contributed to the differences in the evolution paths of the subsidiaries.

Supplier base in the host country

Throughout the 1990s and early 2000s, the limited availability of qualified suppliers in China and India has slowed down the transfer of manufacturing operations to the researched subsidiaries. Labor cost arbitrage alone without the opportunity for localized sourcing was often not sufficient to justify such transfers. Until the mid-2000s, the localization of supply to China and India was often initiated by the subsidiaries in these locations, while the two MNE HQs were delaying rather than encouraging the process. But since the domestic supplier markets had evolved in recent years, the MNE HQs became increasingly eager to replace product imports with local manufacturing and sourcing.

The successful localization of (strategic) supply to China and India has in turn often attracted additional investment and responsibilities to the subsidiaries. This was related to the efficiencies of co-locating development, manufacturing, and suppliers. A good example for this mechanism is the decision of A-PARENT in 2009 to upgrade AM-C in Changsha into a *Development Specialist* for emerging economy product platforms. The subsidiary's R&D team was clearly not up to the task at the time. But the HQ pushed forward with its strategy in order

to benefit from the co-location of product and process development, manufacturing, and cost-efficient machinery suppliers in China. AM-I in India had also applied for the new R&D role. But mainly owed to its uncompetitive supplier market, the HQ assigned to role to its Chinese counterpart AM-C. In a similar example, L-PARENT has upgraded L-C in Foshan into a global *Product Specialist* in certain product areas in which a significant part of the materials and components were purchased by the global MNE from Chinese suppliers. These examples illustrate how the availability of strong suppliers in a particular host country can induce an HQ-led upgrading of subsidiaries in these locations.

If strong domestic suppliers are to be utilized as global suppliers to the MNE, the efforts of the HQ to upgrade the capabilities of its subsidiaries in these locations are likely to intensify further. For both MNEs, China (and to a lesser extent India) has emerged as an important supply source not only for their domestic plants but also increasingly for their global plants. The motive for global sourcing from China was in most cases cost savings. But for certain raw materials (e.g. *rare earths*), China is virtually the only source worldwide (KORINEK and KIM 2010). The case studies demonstrate that the MNEs' dependence on supply sources in China and India has encouraged efforts to upgrade the capabilities of subsidiaries in these locations. In the case of L-C, for example, a global purchasing team was set up already in 1996. The HQ in Germany has continuously upgraded the capabilities of this team to ensure that the strict quality standards of the global MNE will be met. Consequently, the capabilities of the global purchasing team have soon exceeded the capabilities of the purchasing team for the domestic plant. The head of global sourcing team at L-C observed:

> *Most staff in our department are engineers. [...] They have quality experience, and they also know the production, whereas in the plant purchasing department there are mostly buyers for commercial issues.* (Manager Global Purchasing, L-C)

This superior qualification of the global purchasers has in turn reinforced the capabilities of the plant purchasing team as well as of manufacturing staff in L-C (e.g. through joint trainings). Also in the case of AC-C in Suzhou, the supply of materials, components, and equipment to the global MNE has gradually gained importance. But in contrast to L-C, AC-C does not have a skilled global purchasing team, and the HQ has not demonstrated substantial efforts to strengthen the capabilities of AC-C 's purchasing team to better interact with global suppliers or to tap into new supply sources.

As far as the Indian subsidiaries of both MNEs are concerned, the case studies provide only very limited evidence for global sourcing from Indian suppliers and associated upgrading effects in the respective subsidiaries.

Strategic assets in the host country

Both MNEs have long relied on their units in Germany and in few other developed countries as their main source of innovation. In recent years, however, they have become increasingly open to ideas from their subsidiaries in the emerging economies. It would go too far to describe the strategies of these MNEs as home-base-augmenting or strategic-asset-seeking. But the case studies provide at least some evidence for efforts of these MNEs to enable their emerging economy subsidiaries to tap into external knowledge sources.

A good example for this is the recent effort of L-PARENT to tap into China's knowledge in solid-state lighting (SSL). While the expertise in traditional lighting is concentrated on few developed countries, the center of gravity for technology and product development in the emerging SSL market is increasingly shifting to Asia (and in particular to China). In order to tap into this knowledge base, L-PARENT has invested in L-C in Foshan (LED assembly) and in nearby Shenzhen (R&D center). Another example is the recent effort of A-PARENT to tap into China's knowledge base in the field of eMobility. In traditional automotive technologies, the sophistication of activities performed in China has been moderate until very recently. But in the new field of eMobility, knowledge-intensive activities of foreign and domestic firms are increasingly taking place in China (WORLD BANK 2011). This has motivated A-PARENT to invest in the capacities and capabilities of AC-C to enable it to monitor (and participate in) these innovative activities.

Strategic assets in emerging economies may not primarily locate close to the technological frontier, but may be embedded in the specific characteristics of demand in these environments. Consumer preferences in emerging economies are shifting the focus in many industries away from high-end performance towards simple, cost-efficient products. Owed to the vast size of these markets, these preferences are also increasingly influencing global product standards beyond the emerging economies. This trend has gradually changed the attitude in the two researched MNEs towards the *low-cost mindset* of their Chinese and Indian engineers. A R&D manager of A-PARENT reported:

> *To reduce cost and develop unconventional solutions, I need countries like India. They are great at improvising, that's part of their culture.* (Director Engineering, A-PARENT, trans.)

In recent years, both MNEs have intensified their efforts to access this location advantage in the emerging economies by assigning additional responsibilities to their subsidiaries in these locations and by encouraging them to learn from their host environment. AM-I in Bangalore, for example, was requested by its HQ to contribute to the development of low-cost products.

Similarly, AC-C in Suzhou was requested to contribute its experience in low-cost process design to the development of new manufacturing processes for global plants of the MNE. And L-C and AM-C were assigned mandates to develop low-cost product platforms.

These examples illustrate how the increasing appreciation of the *low-cost mindset* in emerging economies has attracted additional responsibilities and mandates to the researched subsidiaries. However, the case studies also reveal that the availability of a low-cost mindset is unlikely to be sufficient to attract such mandates from the MNE, and that it must be complemented by (at least basic) technical skills, domestic market potential, and/or other location advantages.

National policy and regulations

Policies and regulations on the national level of the host country, such as import and export duties, local content policies, labor law, or the Intellectual Property (IP) regime, influence the strategies and actions of HQ management towards subsidiaries in this location.

In China, duties on imports were gradually harmonized across all industrial products and decreased to nine percent (with some exceptions) after WTO accession in 2001 (HOLWEG et al. 2009). While the remaining duties still create some pressure to localized manufacturing and supply to China, this was not found to have had a strong impact on strategic decisions of the two MNEs. In India, import tariffs on industrial products and components remain on a comparatively high level despite a series of tariff reductions in recent decades (a major reform took place from 2002 to 2004). As a rule of thumb, import tariffs on components for the automotive supply and lighting industries continue to range from 30 to 40 percent (WTO 2011). Adding to that, the tariff system remains complex with a large number of exceptions, generating additional transaction costs for importing firms (KOHLI 2006, WTO 2011). For both MNEs, this regime had an *import substituting* effect. The CEO of L-I reported:

> *The only reason for the local production [in India] was import duties. [...] Only in certain cases – for example high volumes in other countries – and depending on the kind of product, it was possible to overcome that.* (CEO, L-I)

The interviewees in AM-I in Bangalore confirmed these observations. This suggests that the tariff regime has supported the expansion of manufacturing operations in the Indian subsidiaries (or has at least impeded a downgrading of their operations). However, at the same time the duties might have deprived the subsidiaries from export mandates. Duties on imported components have deteriorated the cost position of products manufactured in India in the MNE network. A flexible use of idle capacities to serve neighboring or global markets, as

observed in China, was therefore not economical. A duty-free export scheme with separate plants dedicated to exports would have been available in India (ALESSANDRINI et al. 2007). But with few exceptions, this option was not utilized by the two MNEs.[25]

Besides duties on imports, duties (or restrictions) on exports can also influence the investment decisions of MNEs. Restrictions on the export of strategic materials can encourage the localization of processing steps related to these materials in close proximity to the raw material source. China's restriction on the export of *rare earths*, a critical raw material for lighting as well as electronics, illustrates this vividly: L-PARENT used to export Chinese *rare earths* to Germany for the production of phosphor and re-imported the phosphor back to China. When China tightened the restrictions for *rare earth* exports in recent years (see e.g. KORINEK and KIM 2010), L-PARENT decided to localize the production of phosphor to a new plant near L-C in the Pearl River Delta in order to secure supply to its operations in China and, in the medium run, also to its global operations.

Another regulatory aspect with potential impact on MNE strategy is local content policy. Requirements for local content in products sold in China's and India's automotive and lighting industry have played an important role for MNEs in these markets throughout the 1980s and 1990s (KUMARASWAMY et al. 2008, HOLWEG et al. 2009). In the initial phase of A-PARENT's engagement in China, local content policy has forced its global OEM clients, and therefore also A-PARENT itself as a *tier-one* supplier, to localize certain operations in China. Similarly, the restrictive *indigenization policy* in India's automotive industry in the 1990s has enforced the localization of certain operations in India (KUMARASWAMY et al. 2008). Also the lighting industry was affected by local content policies. Since the turn of the century, however, the requirements were gradually relaxed (HOLWEG et al. 2009). For the researched subsidiaries in China, local content policy was not found to have had a strong impact on the evolution of their operations. When the subsidiaries started their operations (in particular A-PARENT), the local content policy had already been relaxed to a considerable degree. Only in very few cases, investment or know-how transfers beyond the MNEs' already ambitious localization plans were enforced by such requirements. Also in India, no significant impact of local content requirements on the evolution of the subsidiaries could be identified.

Besides formal local content policy, authorities in China and India did of course also apply a range of *soft* mechanisms to encourage an upgrading of the value-add in MNE subsidiaries.

[25] AM-I operates a separate plant in this export scheme for the assembly of components for a sister subsidiary in Europe. However, due to global overcapacities, the volumes of this export-oriented plant remained negligible compared to the overall output of AM-I, and additional export mandates could not be secured.

As these mechanisms were often administered on the provincial or city level, they shall be discussed in the section on regional drivers below (*chapter 4.4.3*).

Another important regulatory aspect is labor regulation. Compared to most other emerging economies, labor regulation in India is very strict. Workforces tend to be well organized in powerful unions. Among the most controversial laws is the 1976 amendment to the *Industrial Disputes Act* which makes layoff of workers and the closure of plants illegal without government permission (which is rarely granted). The dispute resolution mechanism and the frequency of strikes and lock-outs are also notorious (AHSAN and PAGES 2009).

The case of AM-I in Bangalore illustrates vividly how labor relations in India can negatively affect HQ-subsidiary relations. In 2010, negotiations between management and unions about planned productivity increases escalated into a strike lasting several weeks. While the productivity of AM-I was eventually improved, the conflict had a negative impact on HQ-subsidiary relations. Even before the strike, A-PARENT was not enthusiastic about investing in AM-I and in India in general. The strike has further deteriorated the HQ's attitude towards AM-I, and will likely impede future investment.

A similar case was experienced by another subsidiary of A-PARENT in India.[26] A strike in the plant in 2006 has deteriorated confidence in the HQ in the host environment as well as in the subsidiary. In the course of the strike, planned investment in new production lines was cancelled or delayed, and still today about half of the subsidiary's manufacturing facilities remain idle. By 2010, HQ-subsidiary relations have still not fully recovered.

L-I in Delhi and Sonepat did not experience comparable difficulties. Workers and labor union were satisfied with the bold improvements L-PARENT had brought to the plant since its acquisition in the 1990s. And relatively high wages, good working conditions, and the lack of alternatives in the region contributed to maintain good relations with the unions.

In China, no substantial conflicts with the workforces and unions were experienced by the subsidiaries of the two MNEs. Labor regulation was generally more relaxed than in India (COONEY et al. 2007, TSAI and TIEN 2010). And while workers' councils did exist in the subsidiaries, they did not engage in hard bargaining for wages and productivity as observed in India. A series of high-level labor conflicts in China in 2010 (e.g. at Foxxcon in the Pearl River Delta) has created some unease among HQ managers. But until today, labor relations in the subsidiaries have not deteriorated. Labor law and union activity has therefore not had an adverse effect on the strategies of the MNEs towards subsidiaries in China.

[26] This subsidiary is located in Pune. Five interviews were conducted with senior managers during a visit in September 2010.

A final regulatory aspect with potential impact on HQ strategy towards its subsidiaries is the IP regime of the host country. Despite substantial efforts in recent decades to tighten regulations and enforce existing regulations, both China and India continue to have a poor reputation for IP protection (ZHAO 2006, OECD 2008). The MNE HQs were especially concerned about IP protection in China. While comprehensive formal regulation for the protection of IP is in place, the enforcement of these regulations is still considered insufficient by many observers (KEUPP et al. 2010, BIELINSKI 2010). The weakness of China's institutions in protecting IP has generated considerable barriers to knowledge transfer and investment in both MNE HQs. However, these barriers differed from case to case depending on the technologies involved and the risk-aversion of the MNE. AC-C in Suzhou, for example, was operating closer to the technological frontier than other subsidiaries. Its HQ was therefore particularly sensitive to IP-related issues. The Regional President of AC-C reported:

> *China does not have a very good reputation in terms of IP. Therefore it is true that our organization in Germany has strong reservations. They want to transfer know-how only to the necessary part for the market. They do not want to step ahead on that. [...]There is a risk that this slows us down.* (Regional President E, AC-C)

L-C in Foshan was also working with sophisticated technologies (e.g. high-end ceramics lamps). Despite efforts of L-C's R&D team to gain access to core knowledge in these technologies, HQ managers have repeatedly vetoed such an exchange of knowledge, because they feared a loss of critical IP in the Chinese market.

AM-C was the only Chinese subsidiary which did not complain about barriers to knowledge transfer. This was mainly due to the fact that it did not require strategic technologies for its manufacturing processes and products as observed in AC-C or L-C.

India's IP protection regime has also been subject to criticism from trade partners and international organizations (OECD 2008). As in the case of China, India has improved its formal regulatory regime in recent years and decades. But the actual protection of IP still remains insufficient due to ineffective enforcement (OECD 2008, SCHWAB 2010). In contrast to the experience of China, however, the two HQs did not consider IP protection as a pressing problem in India, and the subsidiaries in India did not experience comparable barriers to knowledge transfer. This could be owed to biased media attention towards prominent cases of IP violation in China. But it could also be owed to the fact that the low-cost and low-tech requirements in the Indian market and the absence of sophisticated R&D activities in the subsidiaries did not require transfers of strategic technologies India. Concerns of HQ managers regarding IP loss were therefore less prevalent in India than in China.

Subsidiary	Country	Host market	Labor cost	Suppliers	Strategic assets	Duties and tarrifs	Labor law	IP regime
L-I	India	◕	◕	○	◑	◕	◑	◑
AM-I	India	●	◕	○	◕	◕	◔	◑
AC-I	India	◕	◑	◑	◑	◑	◑	◔
L-C	China	●	●	●	●	◑	◕	○
AM-C	China	●	◕	◕	◕	◑	◕	◑
AC-C	China	●	◕	◕	●	◑	◕	○

○ Strongly impeding ◔ Impeding ◑ Neutral ◕ Supportive ● Very supportive

Table 8: Impact of national configurations on HQ-driven subsidiary evolution[27]

Source: Table provided by author.

4.4.3 Regional level

The strategies and action of the MNE HQs towards their subsidiaries were also found to be sensitive to certain regional configurations such as the characteristics of the regional labor market and the location-bound access to suppliers and localized knowledge.

Regional labor market[28]

The case studies revealed that both MNE HQs have been particularly sensitive to the fluctuation of manpower in their subsidiaries. Owed to above-average wages and the prestige of working for an MNE, fluctuation in the six researched subsidiaries was relatively low compared to the peer group in the respective regions. But by global MNE standards, fluctuation in some of the subsidiaries was very high. In particular in AC-C in the Yangtze River Delta and L-C in the Pearl River Delta, an annual fluctuation rate of 25 percent and more among workers and engineers was not uncommon, especially in the early phase. Subsidiaries in other regions, such as AM-C in Changsha and AM-I in Bangalore, enjoyed significantly less fluctuation. Among other reasons, these regional differences were related to the existence of alternative career opportunities nearby.

Besides impeding the accumulation of capabilities on the subsidiary level, high levels of fluctuation might create barriers to knowledge transfer on the HQ level and might thereby impede an HQ-led upgrading of the value-add and product scope of a subsidiary. The substantial number of staff leaving L-C and AC-C for (regional) competitors has caused

[27] Qualitative assessment based on case study analysis. The table illustrates how national configurations have affected the evolution of the researched subsidiaries by manipulating HQ-level strategies and decisions.

[28] The focus here is on the fluctuation of subsidiary staff (mainly within the region) and its implication on HQ-level strategies and decisions. Labor costs were already discussed as a national-level configuration in *section 4.4.2*.

strong concerns in the two MNE HQs. But with the increasing strategic importance of China and India in recent years, the trade-off between restricting the transfer of knowledge to the subsidiaries to minimize leakage on the one hand and being *locally responsive* and enabling the subsidiaries with the help of knowledge transfers on the other hand has shifted towards the latter in both MNEs. But especially during the early phase of the subsidiaries, concerns in the HQs related to fluctuation have clearly impeded an faster upgrading of these subsidiaries.

Access to strategic assets in the region

The two MNEs were well aware that the access to strategic assets in the host environment is often bound to specific regions or even cities, making it necessary to locate operations in close proximity to the sources of these strategic assets.

A good example for this is the recent effort of L-PARENT to tap into China's knowledge in *solid-state lighting* (SSL). Besides a minor investment in L-C in Foshan, the bulk of the MNE's investment in SSL was allocated to a new R&D center in nearby Shenzhen.[29] The decision against an upgrading of the experienced plant L-C was related to the development stage of the technology as well as regional (and even local) context configurations. SSL is still in its infancies, and producers invest heavily in research and standard setting for commercial applications. In contrast to traditional lighting technology, China holds a strong technology position in SSL. This expertise is concentrated in few clusters of innovative suppliers, competitors, and universities. Foshan, the home of L-C, offers only limited access to this SSL expertise, while nearby Shenzhen has emerged as a leading cluster for SSL in China. In order to tap into this expertise, L-PARENT has therefore decided to invest in a new unit in Shenzhen instead of upgrading the operations of L-C.

The case of AM-C provides interesting counterevidence for the *responsiveness* of MNEs to regional configurations. The HQ-led upgrading of this subsidiary into the R&D center for Asia-Pacific has ignored obvious shortcomings in the local and regional environment. A-PARENT was determined to co-locate development activities with the existing manufacturing operations in AM-C. The fact that Changsha and surrounding Hunan Province did not offer favorable conditions for such activities has not altered this decision.[30] AM-C and Changsha have therefore benefited from the establishment of a sophisticated R&D center without a prior accumulation of human capital, research infrastructure, or strong suppliers.

[29] Shenzhen is located a two and a half hour road trip away of Foshan in the Pearl River Delta.

[30] In 2010, AM-C established a separate R&D center in Shanghai to compensate for the weak labor market in Changsha.

These observations illustrate that regional and local configurations can influence HQ strategies towards a particular subsidiary. But they also show that the magnitude of this influence might depend on a range of considerations unrelated to the regional environment.

Regional policy and regulations

The two MNE HQs were at least partially aware of regional policy and regulations in the host environments of their subsidiaries. But in none of the cases such institutional factors were found to have substantially altered HQ-level strategies and decisions. In the cases of Suzhou (AC-C), Foshan (L-C), and Changsha (AM-C), the experience from frequent site visits and regular interaction with subsidiary managers has created an overall positive attitude among HQ managers towards these regions. This attitude has clearly facilitated the HQ-led upgrading of these subsidiaries. However, a more direct impact of regional policy and regulations on the two HQs could not be observed. Key decisions regarding the product and R&D mandates of the subsidiaries were embedded in global MNE strategies, and subsidies, tax rebates, and other incentives of regional authorities were not found to have substantially altered these decisions. In the case of the Indian subsidiaries, regional policy and regulations were not found to have had a strong impact on HQ-level decisions. The attitude of HQ managers was not as positive as in the case of the Chinese regions, and most interviewees were not aware of (significant) incentives of regional authorities which could have encouraged additional investment. But at the same time regional policy and regulations were not found to have had an adverse effect on HQ-level decisions.

Subsidiary	Location	Regional labor market (fluctuation)	Access to regional strategic assets	Regional policy and regulations
L-I	NCR (Delhi/Sonepat)	◑	◑	◑
AM-I	Karnataka (Bangalore)	◑	◑	◑
AC-I	Karnataka (Bangalore)	◑	◑	◑
L-C	Pearl River Delta (Foshan)	○	◔	◕
AM-C	Hunan Province (Changsha)	◑	◑	◕
AC-C	Yangtze River Delta (Suzhou)	○	◑	◕

○ Strongly impeding ◔ Impeding ◑ Neutral ◕ Supportive ● Very supportive

Table 9: Impact of regional configurations on HQ-driven subsidiary evolution[31]

Source: Table provided by author.

[31] Qualitative assessment based on case study analysis. The table illustrates how regional configurations have affected the evolution of the researched subsidiaries by manipulating HQ-level strategies and decisions.

4.5 Direct impact of the environment on the subsidiary

Besides influencing HQ-level strategies and actions, configurations of the external environment and linkages to external partners do of course affect subsidiary evolution also more directly by fostering subsidiary-level capabilities and initiatives. In the following, case study evidence for such external drivers on different geographic levels will be presented. Particular attention will be paid to configurations and linkages on the regional level.

4.5.1 Global level

Trends in the global economy and industry have affected the subsidiaries mainly through their impact on the MNEs' strategy and resource allocation (see *chapter three*). However, such trends can also create opportunities (or threats) on subsidiary level. Technology trends in the respective industries, for example, have challenged the MNE-internal roles of the subsidiaries and motivated a range of subsidiary-level initiatives.

In the lighting industry, the trend towards solid-state lighting (SSL) has motivated L-C to lobby its HQ to transfer new mandates for this technology to the subsidiary. The technical site head toured the lead plants in Germany to create awareness for the advantages his site in Foshan. These efforts were eventually rewarded with the assignment of an SSL assembly mandate. At the same time, however, the trend towards SSL challenges the strong position of L-C in the MNE, which is mainly based on its expertise in traditional lighting products. The management of L-I in India has also attempted to benefit from the SSL boom. But the volumes of SSL products in the Indian market are still too small to justify investment in new manufacturing lines there. Most of the SSL business of in India was therefore operated through imports or third-party partners and has not altered the scope of L-I's operations.

In the automotive industry, the trend towards low-cost vehicles, fuel efficiency, and eMobility has motivated the subsidiaries of A-PARENT to develop new products for these requirements. In the case of AC-C, for example, the local engineering team has proactively engaged in the development of electronic control units for eMobility. With this new development, the subsidiary plans to serve the domestic market and at a later stage also the global market.

These and other examples in the case studies demonstrate how global (technology) trends can inspire subsidiary-level initiatives to proactively expand the scope of their operations.

4.5.2 National level

Important determinants for the capabilities and strategic behavior of MNE subsidiaries on host country level include factors related to the domestic market (e.g. size and growth of demand, customer requirements, competitive pressure) and to the institutional framework. Other context configurations, such as the availability of labor, suppliers, and infrastructure, are often bound to particular regions and shall therefore be discussed separately in a discussion in *regional evolution drivers* below (*section 4.5.3*).

Size and growth of the domestic market

The automotive and lighting markets in China and India grew very dynamically over the past two decades (SANDERSON et al. 2008, STURGEON and BIESEBROECK 2010, WORLD BANK 2011). This growth has induced the subsidiaries (in particular the ones in China) to proactively expand and upgrade their operations. AC-C in Suzhou, for example, has engaged in comprehensive upgrading initiatives to keep track with the requirements of domestic demand. The Regional President reported:

> *There is a pull from the market that is pressuring the organization to move forward. If we were in a relatively stable market we had no chance to change and grow like this. […] In order to survive in this market, we need to expand the portfolio. Our team is currently developing a new low-cost […] product. […] Things like this justify the growth of our engineering team from 30 to 120.* (Regional President E, AC-C)

Along similar lines, a manufacturing manager of AC-C confirms that external market pressure rather than endogenous capabilities had motivated the subsidiary to upgrade of its operations:

> *The increase from four to 22 product families and the build-up of engineering capabilities was not driven by competent engineers who wanted to do more. It was rather market demand enforcing this, and we tried to meet these requirements.* (Head of Department E Assembly, AC-C)

Similarly, AM-C and L-C have attempted to attract additional product mandates and investment from the HQ in order to meet the requirements of their customers and to realize the additional business opportunities in the domestic market.

The dynamic growth in the Indian automotive and lighting market – in particular since the turn of the century – has not motivated comparable upgrading initiatives of the Indian subsidiaries as observed in China. In the mid-2000s, L-I has in fact attempted to attract new mandates to its site. Among other initiatives, it has requested the establishment of a second plant nearby and the transfer of additional product lines. But in recent years, the ambitions of the subsidiary to expand the scope of in-house operations have been replaced by a preference

for outsourcing to external partners. Similarly, in the case of AM-I in Bangalore the growth of the Indian automotive market did not translate into ambitious initiatives to expand the scope of the subsidiary's operations. Instead, the value-add in manufacturing was gradually reduced by outsourcing various activities to external partners. Only since very recently, AM-I began to evaluate options to retrieve some of the outsourced value chain steps. The third Indian subsidiary, AC-I in Bangalore, has only been operational for few years. The first two years were dominated by the global crisis and the downturn in the Indian market, causing AC-I to miss the targets of its business plan. In this situation, AC-I was not motivated to pursue an expansion of its operations. The recent attempts of AC-I to *pull* certain product mandates from China to its site were motivated more by efficiency considerations than by market growth in India.

Among other factors, the different strategic responses of the six subsidiaries to the dynamic growth in their domestic market were the result of the subsidiaries' cost position. In the case of L-I and AM-I, the lack of initiative to upgrade and expand the scope of their operations was at least partially related to their lack of cost competitiveness in the domestic market, which was – among other factors – a result of their failure to penetrate the domestic market with their product portfolios and, hence, to generate scale economies. Owed to this cost disadvantage, the two subsidiaries have increasingly preferred to outsource activities to third-party partners instead of expanding their in-house operations.

The different strategic responses of the subsidiaries to market growth might also reflect different levels of *entrepreneurship* of subsidiary staff. Some of the interviewed HQ managers argued that the subsidiaries in China have simply demonstrated more ambition to achieve market leadership than their Indian counterparts.[32]

In order to explain the different strategic responses of the subsidiaries, it is also important to consider that the market size in China and India differs significantly. This difference in market size – and associated scale economies – partially explains why the subsidiaries in China and India have pursued different strategies. The Regional President of AC-C observed:

> *Scale economies are very important for the [automotive electronics] business. We need a substantial volume to justify investment, justify R&D, justify overhead. The growth of the market size is a very important factor [...] for our product strategy, portfolio strategy, and investment decisions.* (Regional President E, AC-C)

[32] The differences in *entrepreneurship* in China and India are discussed in *chapter three*. Among other factors, the discussion in *chapter three* emphasizes the delegation of a large number of expatriates to China, which was not the case in India.

Similarly, the R&D head of AM-C argued that the size of the Chinese market has motivated the HQ to upgrade AM-C's R&D operations rather than to invest in its counterpart in India:

> *The Indian market is very small. [...] Our market, in contrast, is very large. Therefore we can or must afford a large R&D department. [...] This was the main reason to establish it [the new R&D center] here.* (Director Engineering, AM-C, trans.)

The interviewees in India made similar comments regarding the link of market size and subsidiary upgrading. A manufacturing manager of AM-I in India, for example, reported:

> *The volumes we had earlier used to be around 10.000. Now we are looking at 30 to 40.000. And only then it can make sense to have semi-automated lines with better process safeguards and things like that.* (Senior Manager Engineering & MFG, AM-I)

Along similar lines, interviewees at L-I argued that the relatively small volume of most product families in India did simply not justify investment to upgrading of L-I's operations.

Requirements of domestic demand

The literature on competitive strategy (often associated with PORTER 1985, 1990) claims that demanding customers in a particular location motivate firms in this location to engage in optimization efforts and innovation. In contrast to the developed economies, demand in emerging economies is less characterized by sophisticated technical requirements (e.g. in terms of technology or quality) and more by the requirement for cost-efficient, functional products and flexible delivery. Moreover, large emerging economies such as China and India are (increasingly) characterized by the co-existence of demand for low- and high-end products, which adds further complexity to the management of subsidiaries in these locations. These considerations raise questions about whether and how customers in large emerging economies can inspire innovation and optimization efforts on the level of MNE subsidiaries.

The pressure to offer flexible and fast delivery was experienced by all subsidiaries in China and India. Product models generally change faster and sales volumes and customer preferences are highly unpredictable, generating immense time-pressure in development and manufacturing. Interviewees at AC-C, for example, reported that domestic customers put strong pressure on the subsidiary to localize engineering activities to China in order to perform the application of new products faster and cheaper. Some domestic customers have explicitly declared the localization of such activities a condition for further business, because they were concerned about the lack of flexibility and/or cost effectiveness of development activities in the HQs. Consequently, AC-C tried to *pull* additional responsibilities to its site. While this ambition was impeded by HQ resistance as well as insufficient capabilities in the

subsidiary itself, the responsibilities of AC-C were gradually expanded. Similarly, interviewees at AM-C and L-C reported that the pressure to reduce time to market in development and application has motivated initiatives to upgrade of their R&D capacities.

Also in India, the subsidiaries have experienced pressure from domestic customers to localize application and development activities. In the case of the newly established unit AC-I, for example, the management realized after only one year of operation that without local development capacity it will not be able to serve the dynamic domestic demand. The General Manager has therefore successfully requested additional resources from the HQ.

The requirement for fast and flexible delivery did not only motivate an upgrading of development and applications operations, but it has also triggered a range of process innovations. In the case of AC-C, for example, the large variety of domestic and foreign OEM clients in the Chinese market (each with unique specifications) and the short development cycles have induced innovations in the application process (e.g. the development of semi-standardized components). These innovations have significantly reduced cost and duration of the application process. This process innovation has received MNE-wide attention and was recently even nominated for an internal innovation award.

The requirement for flexible and fast delivery has also affected the subsidiaries' manufacturing operations. In both industries, domestic customers have explicitly or implicitly requested the subsidiaries to localize manufacturing operations to the host country – for both cost and efficiency reasons. This pressure from customers has further reinforced the initiatives of subsidiary managers to expand the product and value-add scope of their local operations.

Besides the requirement for flexible delivery, demand in emerging economies is characterized by a preference for low-cost and functional products. The manufacturing head of L-I explained this requirement as follows:

> *Here you have to innovate for frugality. […] Indian or Chinese customers […] say: you give me something similar to what they have in Germany […], but with 20 percent less features and 50 percent of the cost. It is a paradigm shift.* (Vice President MFG, L-I)

A similar observation was made by the R&D head of AM-C in China:

> *In China, the [hydraulics] products can have fewer functions. The basic functions are sufficient. [...] In Europe many comfort functions are included, and this changes the requirements for the electrical drive. [...] What we can learn here is that in Germany we have the tendency to over-engineer the functions and features. Here they say we want [hydraulics] and nothing else. This way we can achieve drastic cost savings. It is a different philosophy.* (Director Engineering, AM-C, trans.)

In both MNEs and host countries, the product and service portfolios transferred from the MNEs to the subsidiaries could not always be satisfied these requirements. The responsibility for development was therefore gradually shifted to the subsidiaries in China and India. A business unit head of L-PARENT in Germany reported:

> *We have to develop more products for Asia in Asia. [...] Because we have no clue what is sufficient in China. We continue to bring in products made in Germany. These are good products, but they are very high-end.* (Vice President P, L-PARENT, trans.)

The low-cost requirement of domestic customers has challenged the home-base advantage of the two MNEs and has motivated an adaption of product and service portfolios to domestic requirements. AC-C, for example, has proactively developed low-cost product variations. This included a low-cost airbag product, which has been launched in the Chinese market in 2010. In contrast to the products designed in the developed economies, this product was stripped down to the very basic functions in order to meet the cost requirements of domestic customers. L-C has also made efforts to develop low-cost varieties. And AM-I in India has proactively engaged in several developments, for example low-cost product designs for domestic customers with limited purchasing power and weather- and shock-proof components for the rough conditions on Indian roads. Although L-I has recognized a similar need for action, it has failed to accumulate the required capabilities and/or to secure sufficient support from the HQ to engage in R&D beyond the niche of electronic control gear.

A particularly challenging characteristic of demand in China (and increasingly also in India) is the co-existence of high- and low-end requirements. As described above, the mass market of both the automotive and lighting industries has traditionally been dominated by the requirement for low-end products. But in recent years, the demand for sophisticated products in China's industrialized East Coast and increasingly also in the recently industrializing metropolitan areas in the West (e.g. Chongqing and Chengdu) as well as in India (e.g. in the National Capital Region and Greater Mumbai) has been growing rapidly (KHARAS 2010). For the subsidiaries, these differentiated customer requirements have induced an upgrading of their product portfolio (and therefore manufacturing operations) in order to cater to sophisticated market requirements while at the same time maintaining their competitiveness in the low-end mass market. This situation was particularly prevalent in China, where the size of the high-end market has justified investment in local manufacturing. In India, the two MNEs have mostly continued to serve the market for high-end products through imports.

Over time, the initiatives of the subsidiaries to adjust their processes and products to the *low-cost* requirements in the domestic market have reinforced their capabilities and increasingly

also their MNE-internal role, as the two MNEs recognized these emerging-economy-specific capabilities as an interesting contribution to their knowledge base.

The strategic response of the subsidiaries to pressure from domestic customers has differed significantly between subsidiaries in China and India. The Chinese subsidiaries in both MNEs have generally been more proactive (and successful) than their Indian counterparts in adjusting products and processes to the domestic market, although the pressure from the market to do so was comparable. Among other factors, this was related to the presence of large expat communities in the Chinese subsidiaries which did not only have the ambition, but also the means (in terms of technical know-how and networks) to succeed with upgrading initiatives. The absence of expat communities in India partially explains the lack of (successful) upgrading efforts there. However, the case studies also demonstrate that successful responsiveness to domestic requirements cannot be achieved with expatriate managers alone. Interviewees in L-C and AC-C in China, for example, reported that in the early phase of these subsidiaries, the ethnocentric mindsets of German expatriate managers have impeded required adjustments of processes and products to domestic requirements. Only with the appointment of several Chinese managers to strategic position in the subsidiaries, the capacity of the subsidiaries to respond to market requirements was reinforced.

While the requirements of domestic demand had a largely positive impact the subsidiaries' product and value-add scope, the impact on their geographic scope was mixed. The adaption of products to lower performance- and quality-parameters bears the risk that these products might no longer qualify for exports to the world market. This was the case in L-I in India, where most products were localized successfully until they did no longer achieve *export quality*. Similarly, the specification of most of AM-I's products were not suitable for exports – at least to the developed countries. Interviewees in the MNE HQs confirmed the existence of such barriers. But at the same time HQ managers stressed that other (subsidiary-level) factors might have been more important for the failure of the Indian subsidiaries to capture export mandates. In L-C in China, the only subsidiary with (global) export mandates, the trade-off between catering to the domestic or global requirements had the opposite effect: L-C has dedicated considerable efforts in the past to achieve the standards of L-PARENT. As a result, it has increasingly struggled to compete in China. It was recently even forced to outsource certain value-add steps to domestic partners in order to restore its competitiveness. These findings suggest a trade-off in the evolution of MNE subsidiaries in emerging economies between the product, value-add, and geographic scope of their operations.

Competition in the host market

A particular challenge for MNEs in the Chinese (and increasingly also the Indian) market is the differentiated competitive landscape, which ranges from basic local shops over sophisticated emerging economy firms to global market leaders.

In the high-end segment of the domestic automotive market (e.g. developed-market-OEMs with global standards) and the domestic lighting market (e.g. large *business-to-business* projects), the researched subsidiaries competed successfully with their strong reputation and their technology and quality advantage. In this segment, the subsidiaries experienced only limited pressure to their adapt product portfolios or localize manufacturing. For both quality and efficiency reasons, this segment was often served through imports.

Over time, the subsidiaries have gradually moved into the middle segment of the market, where the subsidiaries faced fierce competition from low-cost domestic players.[33] The major challenges for the subsidiaries were their expensive overhead (e.g. SAP systems or expatriate managers), high standards in processes and products (e.g. with regard to quality and safety), and high material and component cost (among other factors a consequence of import duties). With the gradual sophistication of customer requirements and the tightening of regulations in recent years, the competitive position of the subsidiaries has been reinforced, as they were increasingly able to exploit their home-base advantage. But overall, competition for the subsidiaries remained fierce.

This competition has motivated a range of counter measures in the subsidiaries. As discussed above, the subsidiaries have attempted to adjust their product portfolio to domestic requirements. But the high quality and safety standards of the MNEs set limits to these efforts and provoked heated debates between HQ and subsidiary management about which compromises to the MNEs' standards were acceptable in order to compete successfully with domestic firms. The subsidiaries have also responded to domestic competition with a range of efficiency-related measures. This included the accelerated localization of components and services. In the case of L-I and AM-I in India, fierce domestic competition has also encouraged the outsourcing of certain value-add steps in manufacturing to external partners in order to improve the subsidiaries' cost position. Likewise L-C in China has recently outsourced certain value-add steps to improve its cost position in the domestic market.

[33] The only exception is AM-I in Bangalore, which has focused on this segment in India right from the beginning.

National policies and regulations

National policies and regulations in China and India have played an important role in encouraging or discouraging initiatives to upgrade the subsidiary's operations.

Compared to their experience in India, the interviewees in both MNEs perceived China's regulatory framework as more supportive and China's authorities as more ambitious to increase the value-add of MNE subsidiaries. This ambition is reflected by the central government's *11th Five Year Plan* (2006 to 2011) with its focus on indigenous innovation (and the associated increase in funding for high-tech R&D) and the launch of a new *15-Year Plan for Science and Technology* (2006 to 2020) with the ambition to close the innovation gap to the developed countries (WORLD BANK 2008, BIELINSKI 2010). The focus of the central government of increasing the value-add in a range of industry sectors is also reflected in the National High Technology R&D Program (i.e. the *863 program*), which was initiated in 1986 (and renewed periodically) to close the technological and innovation gap between China and the developed economies (FAN and WATANBE 2006). The program aims at reinforcing China's research infrastructure with a particular focus on energy (efficiency) technologies. Both the automotive and lighting industry have benefited from the program in the form of technology parks, financial incentives and other measures (GALLAGHER 2006, SANDERSON et al. 2008). China's current business- and FDI-friendly regulatory environment is the result of a series of liberalization initiatives over the past three decades. In particular in the run up to WTO accession in 2001, duties and trade barriers were reduced significantly (WTO 2010). The business-friendly regulatory regime in China also includes a tax reduction (15 instead of 25 percent corporate income tax for *new-/high-technology enterprises* fulfilling a set of requirements ranging from innovative activities to average staff qualification) (LI 2008). The three subsidiaries in China have successfully applied for this status. The interviews at L-C, AC-C, and AM-C suggest that these and other policies and regulations have been very supportive to the evolution of the subsidiaries in China.

The Indian government has also introduced a range of business-friendly policies and industrial development programs – in particular since the turn of the century. This included ambitious deregulation programs and the provision of public funds for technological upgrading in selected industry sectors (automotive being one of them) (KOHLI 2006, KUMARASWAMY et al. 2008). Yet despite these efforts, the interviewees in the two MNEs experienced the Indian government as rather passive when compared to their experience in China. This could be due to the fact that in contrast to China, economic policy in India in the past two decades was focused less on offering preferential treatment to individual investors

and more on deregulating the overall investment environment (URATA 2011). Despite a series of trade liberalization measures, India maintains duties of up to 40 percent on imported materials and components (URATA 2011). These duties have protected the manufacturing operations of the Indian subsidiaries against imports from sister subsidiaries in China. Interviews in both MNE HQs suggest that in absence of these import duties, the value-add and product scope of the Indian subsidiaries would already have downgraded due to their uncompetitive position in the MNE network. Some of the interviewed HQ managers expressed the view that this protection against imports might have discouraged efforts of the subsidiaries in India to upgrade their operations and catch up with the efficiency and quality standards of the MNE. While it is difficult to evaluate the validity of such propositions with the available data, it is probably safe to assume that a credible threat to terminate manufacturing in India altogether would have motivated more ambitious optimization efforts in Indian subsidiaries. Another aspect of the Indian business environment frequently mentioned in interviews with subsidiary managers is the *excise duty* of around ten percent on most goods manufactured in India (AGGARWAL 2004). While this duty is more or less neutral vis-à-vis domestic competitors, it was clearly a disadvantage of the Indian subsidiaries in MNE-internal competitive biddings for export mandates. Duty-free schemes for export-oriented units would have been available in India, but due the uncompetitive position of the Indian subsidiaries also in other areas, this option was not utilized by the MNEs.

Labor regulation is frequently cited as a major disadvantage of India's regulatory environment vis-à-vis other emerging economies. According to some observers, the Indian labor law has functioned as a major barrier to FDI and to growth in India's manufacturing sector in the years since the liberalization of the Indian economy (SHARMA 2006, AHSAN and PAGES 2009).
The interviewees in India expressed similar views. Both L-I and AM-I have struggled to achieve competitive levels of productivity and variable costs vis-à-vis sister subsidiaries in other emerging economies. In particular the interviewees in AM-I in Bangalore related the lack of competitiveness of their subsidiary to strong unions and strict labor laws which have not allowed for sufficient flexibility to adjust productivity (and salaries). Both the HR and the General Manager of AM-I argued that resistance from the labor union had repeatedly slowed-down the efforts of the subsidiary to streamline operations and improve its competitiveness. The gradual reduction of value-add in manufacturing and therefore the downgrading of its operational scope was – among other reasons – a response to these difficult labor relations. While subsidiary and HQ managers agreed on these difficulties, both sides were careful not to

overemphasize the impact of these factors on the evolution of the subsidiary vis-à-vis a range of other adverse factors in the internal and external environment.

In contrast to this experience of AM-I, L-I in Sonepat did not experience adverse effects related to the Indian labor law and union power. At no point L-I's strategy had to be altered due to union resistance. The labor union was satisfied with the comparatively high wages, good working conditions, and comprehensive training efforts at the plant. Explanations for these – by Indian standards – harmonious labor relations differ between HQ and subsidiary managers: while subsidiary managers see it as a result of their efforts to reach out to the unions, critical HQ managers see it rather as a sign that L-I was not *trying hard enough* to optimize the productivity of the plant.

The subsidiaries of both MNEs in China have experienced the national labor law as a location advantage, as it provided sufficient flexibility to up- and downscale staff in times of volatile demand. The plant head of AC-C, for example, reported that the subsidiary had been able to negotiate reduced working hours with its manufacturing staff during the downturn in 2008 and additional shifts on weekends when domestic demand eventually bounced back. Interviewees in AC-C and the other Chinese subsidiaries rated this flexibility as a key success factors for the dynamic expansion of their operations in a difficult market environment.

Besides these observations regarding the general regulatory framework of the two host countries, a range of sector-specific policies has influenced the evolution of the subsidiaries.

Policies concerning the *lighting industry* have been largely supportive for the subsidiaries of L-PARENT in both China and India. In China, the *National High Technology R&D Program (863 program*) has funded five large research parks (including Shenzhen in the Pearl River Delta) for the emerging solid-state lighting industry. And as part of its efforts to promote energy saving technologies, the central government has also increasingly promoted energy-efficient lighting products (e.g. compact fluorescent lamps or solid-state lighting) (SANDERSON et al. 2008). Stricter regulations on the energy usage of lamps has increased the requirements for domestic producers and thereby reinforced the competitive position of the technologically advanced L-C. The central government has also financed a comprehensive *green lighting* initiative, in which large quantities of energy-savings lamps were subsidized to open up a larger market for these products (SANDERSON et al. 2008). L-C has acquired contracts for several million energy-saving lamps in the context of this initiative. Also in the emerging field of solid-state lighting, the central government has introduced ambitious initiatives to open up the market. L-C has benefited from these initiatives in the form of

subsidized sales and – more generally – in the form of growing demand for these products. Moreover, these initiatives of the government policies have encouraged L-C to expand its capacities for such products and to request new product transfers from the HQ.

Likewise the Indian government has recently begun to increase pressure on the domestic lighting industry to enhance the energy efficiency of its products. Among other measures, it has supported projects in the *Clean Development Mechanism (CDM)* scheme of the Kyoto protocol to open up the Indian market for energy-efficient lighting (PUROHIT and MICHAELOWA 2008). L-I has participated in some of these projects, which have generated additional revenue and scale economies for the subsidiary. These government programs, together with a growing awareness for energy-efficiency among consumers, have motivated L-I to request the transfer of more sophisticated energy-efficient products from the MNE.

India's environmental standards have been increasing in recent years, but they are still very low compared to European (and even Chinese) standards. An example for this is the use of lead in lamps, which exceeds European standards multiple times. The adaption of L-I's products to these low standards has been one of the reasons why the subsidiary has repeatedly failed to qualify for exports to the global MNE.

In an attempt to protect domestic lighting producers, the Indian government has introduced anti-dumping measures against imports of certain commodity lighting products (BOWN 2009). Together with the already high import duties, this measure has protected the operations of L-I against imports from external and MNE-internal competitors.

Policies concerning the *automotive industry* have also been largely supportive for the subsidiaries in both China and India. In China, the central government has declared the automotive industry as a core industry since the 1990s (WANG 2003). It has demonstrated strong ambition to develop domestic producers and to attract MNEs to the domestic market to induce knowledge transfer. Comprehensive *infant industry* protection measures (e.g. trade barriers and restrictions on FDI) have been maintained throughout the 1990s, but have been gradually reduced in the *10th Five Year Plan* (2001 to 2005) of the central government (WANG 2003). In the *11th Five Year Plan* (2006 to 2011), the automotive industry is again considered a core industry (GALLAGHER 2006). In recent years, the central government has put particular focus on energy-saving- and low-emission-technologies such as eMobility. The interviewees in AC-C and AM-C unanimously reported that the central government's policies for the automotive sector have greatly benefited the evolution of their operations. In some

cases, these policies have encouraged initiatives of the subsidiaries –in particular of AC-C in Suzhou – to venture into new technologies such as eMobility.

The Indian government has also put strong emphasis on the automotive sector. In the course of the *New Auto Policy* (2002) and the ambitious *Automotive Mission Plan* (2006 to 2016), the automotive sector was deregulated and public funding for research projects was provided. Local content requirements (referred to in India as *indigenization* requirements) and restrictions on foreign ownership were gradually removed and favorable tax conditions were introduced (e.g. for research in fuel efficient vehicles). The government has also attempted to foster innovation by establishing public automotive R&D facilities (AMP 2006, KUMARASWAMY et al. 2008, PRADHAN and SINGH 2009). Together with the high import duties for finished vehicles, these policies have motivated an increasing number of developed-country OEMs to localize manufacturing in India. This has earned AM-I a range of attractive contracts to supply the OEM's operations in India and – potentially – also in other countries. Emission norms in India remain significantly below developed-country standards. As observed in L-I, the adaption of AM-I's products to these standards has impeded its ability to export to the world market. However, a new series of emerging economy platforms has recently generated opportunities for AM-I to export to other emerging economies.

Subsidiary	Country	Market size and growth	Customer requirements	Competition	General economic policy	Specific industry policy
L-I	India	◕	◑	◑	◔	◕
AM-I	China	◕	◕	◑	◔	◕
AC-I	China	◑	◕	◕	◑	●
L-C	India	●	●	◕	◕	●
AM-C	China	●	●	●	●	●
AC-C	China	●	●	●	●	●

○ Strongly impeding ◔ Impeding ◑ Neutral ◕ Supportive ● Very supportive

Table 10: Impact of national configurations on subsidiary-driven evolution[34]

Source: Table provided by author.

4.5.3 Regional level

The regional environment of a subsidiary features a distinct set of context configurations and localized capabilities which can be assumed to influence its evolution over time. However,

[34] Qualitative assessment based on case study analysis. The table illustrates how national configurations have affected the subsidiaries' ability and motivation to pursue initiatives to shape the evolution of their operations.

such factors on the sub-national have so far not received much attention in the literature on subsidiary evolution. Consequently, the following section will provide a comprehensive account of how regional drivers have motivated, enabled, or impeded a subsidiary-driven evolution path in the case studies.[35]

Regional labor market[36]

The case studies demonstrate that the availability, cost, and qualification of labor in the host environment has played a pivotal role in enabling a subsidiary-driven evolution path.

As discussed before, the comparatively low labor costs in China and India have provided the subsidiaries a strong argument in the MNE network to attract manufacturing and R&D operations for the domestic market as well as for exports to the MNE. However, the role of labor cost for the evolution of the subsidiaries should not be overstated, as it constitutes only a fraction of overall product cost in both MNEs, and comprehensive monitoring and control requirements in China and India have often neutralized the potential for labor cost arbitrage. Only L-C has exported to the world market, while the other subsidiaries have maintained a domestic focus. The cost advantage of these subsidiaries in the MNE network – if it existed – has therefore not translated into an expansion of their geographic scope.

With regard to MNE-internal (cost) competition with units in the developed economies, the exact location of subsidiaries within China or India is almost negligible. But with regard to domestic competition, the characteristics of the location and the regional labor market might matter. L-I (National Capital Region) and AM-I (Bangalore) locate in high-wage areas of India. Both subsidiaries claimed that most of their competitors have benefited from lower wages in more peripheral locations of the country. However, the interviewees emphasized that this has clearly not been the main reason for their uncompetitive cost position in the past. In China, AC-C (Yangtze River Delta) and L-C (Pearl River Delta) also locate in high-wage areas of their host country. For most of their history, regional disparities in wages have not played a crucial role for their competitiveness in the domestic market and therefore also for the evolution of their operations. But since recently, competition with firms located in the Western China with significantly lower labor costs has been increasing, causing concerns in the two subsidiaries for how long their cost competitiveness in the Chinese market can be sustained. Only AM-C in Changsha enjoyed more moderate wage levels compared to some of

[35] A clear-cut distinction of national and regional evolution drivers was not always possible. Some findings presented in this section would fit in either category.

[36] Regional disparities in the availability and qualification of labor and limited mobility of labor between regions within China and India favor a discussion of the factor *labor* on the regional rather than on the national level.

its domestic competitors. But also here, the interviewees argued that this has not played an important role for the competitiveness and evolution of the subsidiary.

The comparatively low labor costs in China and India – together with the requirement to reduced fixed costs and enhance flexibility – have enabled the subsidiaries to increase the share of manual work in their operations. Although it could be argued that these measures have reduced the technological sophistication of the plants, it was observed that they have fostered the technical capabilities and reputation of the subsidiaries and therefore – although more indirectly – the evolution of their operations. In the case of AC-C, for example, the manufacturing engineers have adjusted the product lines transferred from the MNE into manual processes. These efforts resulted in several efficiency-related process innovations, which have earned the subsidiary MNE-wide recognition and have induced the assignment a several global process development mandates to the subsidiary. The other subsidiaries – in particular L-C in Foshan – have engaged in similar efforts to reduce the automation in their plants. Interestingly, with the increasing cost and scarcity of labor in the industrial agglomerations in China and India in recent years, the subsidiaries were increasingly facing pressure in the opposite direction: parts of their operations now had to be automated in order to sustain their competitiveness. L-C in the Pearl River Delta and AC-C in the Yangtze River Delta have therefore recently begun to (re-)automate certain processes in manufacturing.

Besides the cost of labor, the availability and qualification of labor has played an important role for the ability of the subsidiaries to upgrade of their operations over time. Differences in the labor markets for unqualified workers, qualified workers (e.g. technicians), and highly qualified staff (e.g. engineers) favor a separate discussion of each group.

– Unqualified labor –

In China, and in particular in the Yangtze and Pearl River Delta, the availability of cost-efficient (migrant) workers has gradually deteriorated in the past decade. In particular after the annual *Chinese New Year* holiday, the subsidiaries AC-C and L-C had to fill the gaps caused by migrant workers who did not return from their home provinces in Central and Western China. But due to their attractive wages and good reputation, the two subsidiaries were not as badly affected by this development than most domestic firms. AM-C in Hunan Province in South Central China was in a more comfortable position. Due to the rather recent industrialization of the region, plants in Changsha did not yet have to rely on migrant workers, but could hire worker from in and around Changsha who were mostly loyal to the place. The

availability of unqualified labor was therefore never experienced as a problem here. While the fluctuation in the three cases was well above German levels, it was not considered to have slowed down the evolution of the subsidiaries to a considerable degree. A manufacturing manager of AC-C reported:

> *Among direct staff [workers] we have the same fluctuation as the environment - about 20 percent. [...] But this can be compensated because we follow standardized procedures. This does not harm us.* (Vice President MFG E, AC-C, trans.)

In India, the availability of unqualified workers has supported – or at least not hampered – the evolution of the subsidiaries. On the one hand, this was related to the fact that the rural, not yet industrialized areas of India provided abundant supply of unqualified workers to the few industrialized centers. And on the other hand, this was related to the stagnating or even decreasing demand for labor by L-I and AM-I in the course of the outsourcing of parts of their value-add in manufacturing. Fluctuation of unqualified labor was close to nothing in both subsidiaries. This was mainly owed to above-average wages and, at least in the case of L-I's plant in Sonepat, to the lack of alternatives in the immediate environment.

– *Qualified labor* –

The availability of qualified labor for manufacturing (e.g. technicians or line supervisors) has caused more concerns in the subsidiaries. In contrast to unqualified labor, here the deficiencies of the national and regional education systems – from the perspective of developed market MNEs – became prevalent. In China, the subsidiaries struggled with the lack of fundamental technical as well as language skills among graduates and the absence of practical exercise in the educational system. A HR Director of L-C, for example, observed:

> *Ideally the workers should be trained on a vocational level. For example they learn how to operate a machine […] and some basic electronics knowledge. But the Chinese educational system was not able to provide enough of such candidates to us.* (HR Director, L-C)

At least until recently, such problems were mainly experienced by MNE subsidiaries and only to a lesser degree by domestic firms. The same HR manager remarked:

> *Chinese companies are more labor intensive. So workers from these companies do not have technical skills. In [L-C] we have more automation. [...] Someone who can work in the Chinese company may not be able to work here.* (HR Director, L-C)

An adjustment of the subsidiaries' manufacturing operations to the *Chinese production system*, however, was not considered a viable option for both MNEs due to concerns about quality and the lack of acceptance of this system among global OEM customers. The

subsidiaries have therefore engaged in two countermeasures: recruiting staff with prior industry experience (preferably in other MNEs), and improving the internal and external infrastructure for vocational training. The subsidiaries of both MNEs initiated vocational training programs in their respective region in China. In retrospect, interviewees in both MNEs viewed these efforts as one of the key enabling factors for the evolution of their subsidiaries. The stable supply of qualified labor has facilitated the expansion and upgrading of the subsidiaries' operations. And at the same time, the efforts have improved the subsidiaries' relations to regional authorities.

The case studies revealed considerable regional differences in the availability of qualified workers. Suzhou in the Yangtze River Delta, for example, is an established manufacturing center for the electronics and automotive industry. An HR manager of AC-C reported:

> *The benefit of Suzhou is that that we have plenty of resources for the manufacturing area. […] We have many big Fortune 500 companies like Solectron. […] Also Taiwanese and Japanese companies are located here. This SIP area is a special investment. [...] It attracts a lot of companies. [...] So it is not difficult to get experienced people here directly from the market.* (Manager HR, AC-C)

The presence of related industries did not eliminate the general qualification problem. But it gave AC-C access to experienced workers in related electronics industries who could be trained on AC-C's processes with limited effort. The quality of vocational education in Suzhou was perceived to lag behind Shanghai, but still superior to most other parts of the country. The popular construct of the *Yangtze River Delta* as a region (including Shanghai and Suzhou) suggests a common labor market. However, AC-C recruited most of its qualified workers directly from Suzhou. This was related to a lack of mobility in the labor market. Workers from Shanghai generally preferred to stay there due to the availability of better schools, universities, and career opportunities. And if they actually did relocate to Suzhou, it proved very difficult to retain them.

Foshan, the location of L-C, has a long history as the *lighting belt* of China. The presence of many domestic and foreign firms in the same of related industry domains created a favorable environment for recruiting and retaining labor. The HR Director of L-C reported:

> *Besides FELCO [state-owned lighting firm] you can find a lot of lighting companies in Foshan or in this area. This was an advantage for us, [...] because the talent pool is bigger, the quality of talent is better, and […] we can have candidates with different backgrounds. [...] Earlier we targeted Phillips, GE, and National. But nowadays we have hundreds of lighting companies in the market. It is good.* (HR Director, L-C)

With the help of this regional talent pool, and – equally important – in-house vocational training, L-C was able to meet its constantly increasing requirements for qualified workers.

Over time, this location advantage has reinforced L-C's role as a leading manufacturing plant in the global network of L-PARENT.

Changsha in Hunan Province, where AM-C is located, has just recently come on the radar of MNEs seeking manufacturing locations. In 2010, AM-C was still the only wholly-owned Western venture in the region. The availability of qualified workers was very scarce, and the qualification of graduates from regional universities and workers at nearby Chinese manufacturers was hardly sufficient to meet AM-C's requirements. To circumvent the lack of regional talent, AM-C focused its recruiting efforts on the large Hunan-based diaspora in Shanghai. With the help of this recruiting strategy and in-house training efforts, AM-C has so far been able to sustain its dynamic growth path. However, the unfavorable labor market has caused at least some friction in the evolution of this subsidiary.

Fluctuation of qualified workers has been a pressing problem for the subsidiaries on China's East Coast.[37] Besides generating concerns about the loss of knowledge in the HQ, the fluctuation has impeded the accumulation of capabilities in the subsidiaries and therefore a capability-driven evolution path. A quality manager of L-PARENT observed:

> *The fluctuation slows them down. […] Every time they lose people they struggle to get back to their prior level of expertise.* (Manager Quality P, L-PARENT, trans.)

In contrast to the experience of AC-C and L-C, AM-C in Changsha was the MNE-internal benchmark in China in terms of fluctuation. The absence of competing and related industries in this region as competitors on the labor market has helped it to rapidly build up its operations with a stable workforce.

In India, the availability of qualified workers was not experienced as a major barrier for the evolution of the subsidiaries. The principle reason for this was the less dynamic growth of the Indian subsidiaries and, therefore, the absence of ambitious recruiting targets. In particular AM-I did not recruit any (or very few) qualified workers in the past decade. This was related to outsourcing as well as moderate growth in sales.

The interviews with subsidiary managers in India revealed weaknesses in the skill profile of qualified workers in India which were similar to the ones observed in China. Educated in a public system of Industrial Training Institutes (ITI), most candidates lacked practical orientation and fundamental technical know-how.

[37] L-C: 10-15 % p.a. overall and up to 20 % p.a. for qualified workers. AC-C: 5-15 % p.a. for engineers/staff, 25-35 % for qualified workers. AM-C: ~10 % p.a. for engineers/staff and workers.

The contempt about public education is illustrated in a comment of the training head of L-I:

> *Two years they had already studied in the ITI. But we did not give much to that. We wanted to train them according to our requirements. So we started again from level zero.* (Manager Training, L-I)

In the case of the automotive electronics plant AC-I in Bangalore, the regional labor market was favorable. Bangalore has a long tradition in developing and manufacturing electronic components with several plants clustering in and around the city. However, the majority of workers and engineers of AC-I were not actually hired from Bangalore, but from Chennai, another south India industrial center in about 350 km distance to Bangalore. The experience these people had gathered in electronics firms in Chennai was more relevant for the tasks of AC-I than the experience of people in the local labor market. The attractiveness of Bangalore as a place to live as well as the strong reputation of A-PARENT has helped AM-I to reach beyond Bangalore and pick the best and experienced engineers for its new plant. The successful ramp-up of the subsidiary can therefore not be contributed to the labor market in Bangalore, but rather to a wider South Indian labor market.

L-I has operated a nationally renowned in-house vocational training center in its Sonepat plant for more than a decade now. The recruiting for this center (as well as for the manufacturing plant) has focused mainly on the surrounding Haryana state and the National Capital Region (NCR) with Delhi. The good reputation of the center has secured a supply of talented students. In recent years, however, the construction boom in the NCR has made it increasingly difficult to attract (and retain) talent from Delhi. But nevertheless, the availability of qualified labor has always been sufficient to operate (basic) manufacturing operations in Sonepat.

In Bangalore and surrounding Karnataka State – the home of AM-I – the demand for qualified labor in the IT industry as well as in mechanical and electronic manufacturing has increased drastically in the recent decade (VANG and CHAMINADE 2011). For AM-I, however, the increasing shortage of qualified labor in this region did not cause major problems. The subsidiary has reduced rather than increased its headcount since an all-time peak around the year 2000. And the requirement for new skills could be satisfied almost entirely by experts from neighboring sister subsidiaries in Bangalore and by in-house training efforts..

Fluctuation of qualified workers has not been experienced as a major concern by the Indian subsidiaries. In L-I in Sonepat, fluctuation was low due to the comparatively high wages, good working conditions, and a lack of alternatives in and around the plant. And in AM-I in Bangalore, fluctuation was also very low mainly due to the comparatively high wages.

– Highly qualified labor –

The recruiting and retention of highly qualified engineers for process and product development was one of the biggest challenges for the subsidiaries in China and India.

In China, the opinions about the technical capabilities of Chinese engineers varied between interviewees and regions. But the interviewees agreed that there was a general mismatch of the skill profiles of the MNEs and the profiles available in the labor market, although this gap has been narrowing in recent years – owed to both a calibration of MNE standards in China and a general strengthening of human capital in China. The interviewees were missing practical orientation in China's university education. Engineers with domain expertise in specific lighting and automotive technologies (e.g. ceramic lighting technology) were very rare in the labor market. And in particular for the subsidiaries of A-PARENT, the lack of quality orientation of new hires was another major concern.

As far as the recruiting of manufacturing-related *process engineers* was concerned, the labor markets in Foshan (L-C) and Suzhou (AC-C) were not ideal, but sufficient. The universities in these locations graduated a large number of fairly good engineers. Competing and related firms in the region were another important source of engineering talent. In particular in AC-C, several management positions in manufacturing were staffed with hires from nearby competitors. The Regional President of AC-C reported:

> *Many of our production and support people were hired from companies here locally in Suzhou. The Suzhou Industrial Park has been built up over the last 15 years. […] So there are companies here with some good engineers.* (Regional President E, AC-C)

Recruiting from related industries proved more difficult for L-C due to the lack of relevant MNEs in the region as well as the (perceived) incompatible qualification levels of staff from Chinese competitors. AM-C in Changsha has struggled to meet its recruiting targets for qualified process engineers with automotive expertise. The engineering head reported:

> *The labor market in Changsha cannot be compared with Shanghai. All customers, suppliers and competitors – I would say 60 percent of the automotive world – are located in and around Shanghai.* (Director Engineering, AM-C, trans.)

Attracting this talent from Shanghai to Changsha, however, proved very difficult. Only some engineers from the sizable Hunan Province diaspora in Shanghai could be attracted to AM-C. But despite this location disadvantage, AM-C has managed to expand its operations rapidly. Especially in the early phase, this would not have been possible without expat engineers from the HQ. Only since very recently, most of these expats are getting replaced by local engineers trained at AM-C, a sister subsidiary, or at a multinational firm.

For the recruiting of *product development engineers*, none of the locations in China was ideal. While AC-C was located in close proximity to the automotive R&D cluster of Shanghai, it was the only (advanced) development center in Suzhou itself. Attracting the automotive talent from Shanghai to Suzhou proved very difficult. The R&D managers of AC-C were convinced that these shortcomings in the (accessible) regional labor market have impeded an (even faster) evolution of the subsidiary's R&D operations.

L-C in Foshan was also not located in the ideal location to recruit product development engineers. The city has a history as the center of China's lighting industry. But the lack of top universities as well as the lack of attractiveness of the city and the surrounding region compared with the appeal of Shanghai or Beijing made it difficult to develop (and retain) a strong R&D team. While nearby Guangzhou is renowned as a national technology center for a range of industries, the center of lighting technology in China is Shanghai. In solid-state lighting (SSL), nearby Shenzhen has emerged as a leading technology center. But due to fact that L-C remained mainly focused on traditional lighting technologies, it could not benefit from the proximity to the SSL talent in Shenzhen. The interviewees in L-C and in L-PARENT agreed that this lack of suitable engineering talent in and around Foshan has slowed down the evolution of L-C's R&D operations at least to a certain extent.

In the case of AM-C in Changsha, the regional labor market with its lack of experienced engineers proved unfavorable for R&D operations. But nevertheless, A-PARENT decided to establish an R&D center for product platforms in Changsha. Faced with the ambitious targets of the HQ on the one hand and insufficient regional talent on the other hand, AM-C decided to tap into the talent pool of other regions in China. The R&D head of AM-C reported:

> *We could not meet our recruiting targets in Changsha. So we decided in 2009 to set up a second department for product development and cost reduction. [...] It is located in Shanghai. It employs more than 50 people, mostly engineers but also purchasers for simultaneous engineering with suppliers.* (Director Engineering, AM-C, trans.)

By establishing a separate R&D center in Shanghai – together with the delegation of several expatriate engineers from the HQ – AM-C has been able to compensate for the regional talent shortage. However, some of the interviewees questioned if this will be a sustainable solution in the long run.

Fluctuation of manufacturing and development engineers was a serious problem in all three Chinese subsidiaries, but in particular in AC-C and L-C. Fluctuation has impeded the accumulation of expertise in the subsidiaries and has generated concerns in the HQs regarding the transfer of knowledge and technology to these subsidiaries. Over time, however, AC-C and L-C have managed to reduce their fluctuation from 25 percent and more per year to

manageable levels. In the eyes of R&D managers in the two subsidiaries, this achievement has been a key success factor for the accumulation of capabilities and the upgrading of their R&D operations in recent years.

The supply of highly qualified engineers was also a big challenge for the Indian subsidiaries. For the recruiting of *process engineers* in manufacturing, the location of L-I's plant in Sonepat proved unfavorable. The HR head of L-I described the situation in Sonpat as follows:

> *As far as running the plant is concerned - the manufacturing - there is no hurdle. But if you […] want to bring in new products and expand, then definitely you have a skill shortage in this area. […]Around Delhi there is Noida and Gurgaon. If you are located in Noida, you will get people easily. Same in Gurgaon. But not in this place.* (Vice President HR, L-I)

Despite the proximity to Delhi (a two hour road trip), L-I has experienced difficulties in attracting qualified engineers from Delhi and the surrounding National Capital Region to its plant in Sonepat. This was mainly related to the lack of physical and social infrastructure in and around Sonepat. And also in Delhi itself, the availability of engineers with lighting domain expertise was very limited, as India's lighting industry is dispersed across the country. This lack of engineering talent in the regional labor market has clearly impeded a stronger *subsidiary-driven* element in the evolution of L-I.

Concerning AM-I in Bangalore, the availability of manufacturing engineers was substantially better. A-PARENT maintains multiple plants in and around Bangalore. These plants have served as labor pool for AM-I. According to an R&D manager of AM-I, the external labor market in Bangalore was also quite favorable:

> *There are a lot of engineering colleges in this area, and quite a number of people are graduating. We can really choose and select.* (Deputy General Manager R&D, AM-I)

However, Bangalore was not the ideal location for automotive manufacturing. Most of the domestic and foreign OEMs and suppliers operate their plants in Maharashtra State (Mumbai and Pune), Northern India (NCR), or in Chennai in the South (KUMARASWAMY et al. 2008). AM-I could therefore hire only few experienced engineers from other automotive suppliers or related industries in and around Bangalore. But the interviews suggest that this has not impeded the evolution of AM-I to a substantial degree, and that other factors have played a more important role for its evolution over time.

The availability of engineers for *product development* differed significantly between the locations of the Indian subsidiaries. L-I maintains an R&D center for electronic control gear

in Gurgaon, a suburb of Delhi. This location proved favorable for R&D in lighting electronics. The responsibility for development activities concerning the main product of L-I (i.e. fluorescent lamps) lay in the hands of the engineering team in the Sonepat plant. As discussed above for the recruiting of manufacturing engineers, also the recruiting of product development engineers to the plant in Sonepat proved very difficult. This has clearly impeded the development of R&D capabilities in L-I and the upgrading of its R&D operations.

Bangalore, the location of AM-I and AC-I, features the highest density of MNE R&D centers in India (VANG and CHAMINADE 2011). While a significant share of these operations falls in the IT-hardware and -software domain, there are also a range of automotive R&D centers in Bangalore. A-PARENT itself maintains a major offshore soft- and hardware engineering center in Bangalore, which is celebrated as a major success story in the MNE. Domain expertise in mechanical engineering for automotive applications may be stronger in Pune or Chennai, but overall the labor market in Bangalore has met the requirements of AM-I. The sluggish evolution of the R&D operations of AM-I can therefore not be traced back to a lack of technical skills in the labor market.

Fluctuation among highly qualified engineers was a less severe problem in India than in China. In AM-I in Bangalore and in L-I's plant in Sonepat, fluctuation of product engineers was very low. This was related to above-average wages and – at least in the case of L-I – limited career opportunities in the region. Only the L-I's electronics R&D center in Delhi-Gurgaon suffered from substantial fluctuation, because the engineers of this center had many alternative career opportunities in Delhi. The interviews suggest that this fluctuation has severely hampered the accumulation of expertise in the R&D center.

Regional supplier market

Motivated by the potential for cost efficiencies and flexibility gains, the researched subsidiaries (except AC-I) were ambitious to localize the sourcing of raw materials, components and machinery to their host environments. In most cases this localization was driven by initiatives of subsidiary managers as a reaction to pressure (and sometimes even to explicit requirements) from customers in the domestic market. With regard to basic mechanical parts or machinery, all subsidiaries (except AC-I) are today deeply integrated into the domestic supplier market. The localization ratios of the subsidiaries for these parts range from 65 to up to 90 percent depending on the customer industries and product families involved. However, for certain sophisticated mechanical components and many electronic components, imports from Germany as well as from specialized locations such as Penang,

Malaysia (for semiconductors) continue to be more economical. In the case of AC-C, for example, the final products in the automotive electronics field have an import share of 40 to 50 percent, while the mechanical products have an import share of less than ten percent.

The localization of supply did not happen immediately after the establishment of the subsidiaries, but gradually over many years. This was mainly related to the fact that the early movers (L-C, L-I, AM-I) had faced an underdeveloped supplier market. The purchasing head of AM-I reported:

> *Because of the growth of the automobile sector, we have very good suppliers today. This situation was not there in 2004. All over India there used to be only one forging supplier. And he was busy with major customers, so he would never support us.* (Manager Purchasing, AM-I)

Similarly, purchasing managers of AC-C in China reported that domestic suppliers have not been able to provide sufficient quality in the early phase of the subsidiary in the mid-2000s. This was due to the fact that the Chinese automotive industry has long been isolated from the world market through protectionist measures, which has hampered the development of a competitive supplier industry. In the field of automotive electronics, this was also related to the fact that many of the potential domestic suppliers had a history in customer electronics, an industry with significantly lower quality requirements than automotive. Only in recent years, some of the domestic suppliers have matured, and AC-C has been able to localize the purchasing also of more complex components.

The localization of supply by the subsidiaries was also impeded by insufficient capabilities of the subsidiaries themselves. Sourcing in environments with underdeveloped supplier markets often requires a proactive development of suppliers. The subsidiaries had to accumulate the capabilities for such a development before they were able to implement complex localization projects. The expatriate communities in the subsidiaries in China have helped to accelerate this process.

The ability of the subsidiaries to localize supply was also related to their legacy in the host environment (e.g. as former JVs). L-I in Sonepat and AM-C in Changsha, for example, have continued supply relations with the domestic suppliers of their former JV or licensee partners. However, business relations with these *inherited* suppliers were often terminated after a short transition phase, as many suppliers had failed to upgrade to the MNEs' standards. In fact, none of the subsidiaries has today a significant purchasing volume with *inherited* suppliers. Besides such *inherited* suppliers, the staff of the former partners often brought with them social networks in the host environment, which has facilitated access to alternative domestic suppliers. While the *greenfield* ventures such as AC-C in Suzhou have struggled to enter

domestic business networks, the subsidiaries L-I, AM-I and AM-C have benefited from the social networks of their legacy staff. However, while such legacy may have facilitated the localization of supply in the initial phase, the interviewees in both MNEs agreed that proactive efforts to develop existing suppliers and access new supply sources in the region have been much more important for the successful localization of supply over time.

The evolution of the subsidiary's manufacturing operations was in many cases closely related to the availability of suppliers of raw materials and components in the host environment. In the case of L-I, for example, plans to localize new products have repeatedly been postponed in the early 2000s due to the lack of adequate sourcing opportunities in the host environment. As long as certain components still had to be imported with 30 to 40 percent duties, the localization of the final product assembly to India was not cost-efficient. Only since the domestic supplier industry has matured, L-I could attract more products and value-add steps to its plant. In the other case studies, a similar co-evolution of manufacturing operations of the subsidiaries and the maturity of the supply market could be observed.

However, this does not suggest that maturing domestic supply will automatically lead to an upgrading of a subsidiary's operations. On the contrary, maturing supplier markets might motivate a subsidiary to outsource certain value-add steps to partners in the host environment instead of upgrading its in-house operations. This was observed in the case of L-I, whose management has recently cancelled the transfer of a new product line to its plant and has instead outsourced it to a domestic firm nearby.

Besides motivating an expansion of a subsidiary's product and value-add scope, strong domestic suppliers were also found to support the expansion of a subsidiary's geographic scope. In the case of L-C in Foshan, for example, the availability of cost-efficient suppliers in the region has supported the evolution of the subsidiary into *Rationalized Manufacturer* with exports to the global MNE. In the case of the Indian counterpart L-I, the absence of strong suppliers in the region or host country has weakened the MNE-internal competitiveness of the subsidiary and therefore its ability to capture export mandates.

The case studies demonstrate that the localization of supply of the subsidiaries was facilitated by their geographic proximity to suppliers in the host environment. This was mainly related to transportation costs, reaction time for trouble shooting, and flexibility to respond to erratic demand. L-C in Foshan, for example, has benefited from a strong supplier base in its immediate environment. The presence of a major state-owned lighting manufacturer in

Foshan has induced the development of a cluster of material and component suppliers in and around Foshan. According to the head of purchasing at L-C, the fact that most of their suppliers were located in close proximity has helped to optimize the quality of inputs as well as supply chain efficiencies. Moreover, as part of the Chinese lighting community in Foshan these suppliers have also provided L-C access to market intelligence and informal networks it could not access on its own as a foreign venture.

Similarly, AM-I has benefited from the co-location of suppliers. Due to the strong supplier base in and around Bangalore, AM-I could limit the distance to most of its suppliers to a 300 km radius around Bangalore. According to the purchasing head of AM-I, this proximity to suppliers was crucial for reliable delivery, given that India's transportation network was prone to disruptions. Moreover, the proximity was also found to have facilitated frequent interaction and visits at the supplier sites. This close interaction has in turn facilitated the localization of additional materials and components.

Also AC-C in Suzhou has benefited from the concentration of its suppliers in the Yangtze River Delta. The manufacturing head for hydraulics elaborated his sourcing strategy:

> *I want to have 'ship-to-line' conditions. That means my suppliers should deliver at least once a day - better three times a day. And I tell my purchasing and logistics team to choose suppliers within a 50 kilometer radius. [...] This is Lean Management. The suppliers have to be close to the plant.* (Vice President MFG S, AC-C, trans.)

But despite these and other examples for the benefits of a regional supplier base, the case studies suggest that geographic proximity to suppliers might not be sufficient to realize the benefits of localized supply. A purchaser at AC-C in Suzhou reported:

> *The location of suppliers in Suzhou helps if there are quality issues – then we can just go there. But that is not the relationship concept, not all things are necessarily discussed face to face. [...] For selecting suppliers it is important that they have potential and experience. […] Because we cannot build up a supplier from zero, even if they locate in Suzhou.* (Purchaser Components, AC-C)

Similar comments were made by interviewees in the purchasing departments of other subsidiaries. This does not suggest that geographic proximity to suppliers is irrelevant for reaping the benefits of localized sourcing. But it was not experienced as a sufficient – or even necessary – condition for successful localization of supply in the case studies. The case of AM-C in Changsha provides an interesting example to illustrate this finding: The potential suppliers in Changsha and Hunan Province could not meet the requirements of the A-PARENT. Consequently, AM-C was forced to work with domestic suppliers in more than 1,000 km distance to the plant in the coastal area. But despite this disadvantage, AM-C has

managed to localize its supply successfully and to upgrade the quality of its domestic suppliers. However, it is important to recognize that this successful localization – and the successful evolution of AM-C in general – was only possible by exploiting the advantages of the MNE (e.g. superior products, experienced expatriate managers, and highly-efficient manufacturing processes). The interviewees at AM-C were convinced that a strong *regional* supplier base will be important for the competitiveness of the subsidiary in the long run when these advantages will likely deteriorate.

Competing and related firms in the region

Besides contributing to the regional labor market, competing and related firms in the region might offer access to location-bound knowledge and technologies to augment a subsidiary's capability pool. Geographic proximity to competing and related firms can be assumed to facilitate the monitoring and comparing of their operations, practices, and cost structures. Furthermore, it might induce collaborative efforts (e.g. joint R&D projects). The presence of competing and related firms in the region might therefore foster *localized learning* of MNE subsidiaries (MALMBERG and MASKELL 2006).

In the case studies, such localized learning was mainly observed in the cases of AC-C in the Yangtze River Delta and L-C in the Pearl River Delta, where multiple competing and related firms were present. The automotive subsidiary AC-C, for example, has continuously monitored the products and operations of competing and related firms in the region. A manufacturing manager described these efforts as follows:

> *The competitors also have manufacturing plants in Suzhou and Shanghai. […] We compare our strength and disadvantages for similar products to see what the gap is. If they supply at a lower price, why can't we achieve it?* (Head of Department E Assembly, AC-C)

However, the learning from these competing firms was mainly the result of *re-engineering* their products, and not of collaborative efforts. The same manager reported:

> *With these automotive competitors it is not so easy. If you go to their plant and share information with them […] the information you get might not be accurate. Therefore the main activity we did was to analyze their products: What components have they used, what are the costs for the material, and then compare with their market price. Then we know their value-add and profit.* (Head of Department E Assembly, AC-C)

For these activities, geographic proximity to the competitors' plants was not as critical as it would have been for collaborative efforts. AC-C has also benefited from the proximity to domestic and foreign consumer electronics manufacturers in Suzhou and the Pearl River

Delta. From monitoring the operations of these firms, the subsidiary was able to identify several best practices for its plant.

In the case of AM-C in Changsha, the monitoring of competing or related firms proved more difficult. Most plants in the region manufactured diverse industrial and consumer goods, and only few automotive firms were present. While interviewees in AM-C made similar general observations in their host environment than AC-C in Suzhou, a monitoring of (and learning from) relevant firms in proximity to their plant was therefore not possible.

The location of AM-I in India, Bangalore, has a long history in mechanical engineering (DOSSANI and KENNEY 2009). In recent years, it has become renowned as a center for IT, but also for electronics and – although to a lesser extent – for automotive. However, despite this seemingly favorable environment, the interviewees at AM-I claimed that learning from other firms in the region has been very limited. This was related to the presence of several sister subsidiaries of A-PARENT in the region, which has induced an inward-looking search behavior of AM-I. The absence of localized learning might also have been related to the strong *Indian legacy* of the subsidiary and, related to that, the fact that its processes have already incorporated some of the best practices perceived as *innovative* by the expatriate managers in other subsidiaries.

L-I in Delhi and Sonepat did not locate in proximity to competing or related firms. The lighting industry is dispersed across India. And while multiple manufacturing plants in diverse industry domains locate in the region, the interviewees at L-I argued that due to the specific character of lighting manufacturing, L-I has not been able to learn much from these plants.

The best practices identified by the subsidiaries from monitoring firms in their region involved in most cases emerging-economy-specific characteristics. A frequently cited best practice was the superior flexibility of domestic firms. The interviewees observed that competing and related domestic firms were operating highly flexible plants with low fixed costs (e.g. lean overheads and low automation) and highly flexible workforces. This observation has inspired a range of rationalization measures in the subsidiaries. In certain technologies, the subsidiaries were also able to monitor sophisticated technologies. AC-C in the Yangtze River Delta, for example, was located in proximity to domestic and multinational R&D centers for innovative automotive technologies (e.g. eMobility). The same was true for L-C in the Pearl River Delta (e.g. solid-state lighting). The monitoring of these centers' activities has inspired several innovative projects in the subsidiaries.

However, the absorption of many best practices identified by monitoring firms in the region proved difficult. First and foremost, this was related to the MNEs' global standards. Even if domestic firms complied with domestic standards (e.g. regarding product safety) – which some interviewees doubted – many best practices did not comply with the MNEs' internal standards. Additionally, the subsidiaries in the automotive industry stressed that the strict quality requirements of most of their (global OEM) customers would prohibit the adoption of the flexible, low-cost solutions observed in domestic firms. Overall, the interviews therefore suggest that the contribution of localized learning from competing and related firms to augmenting the subsidiaries' capabilities has been limited in the case studies.

Regional research infrastructure

The contribution of regional universities to the labor market has already been discussed above. The focus of this paragraph will be on the actual research activities of regional universities and how might affect the R&D operations of MNE subsidiaries.

A common type of university-firm linkage observed in the case studies is the acquisition of measurement and testing services from universities. The technical head of L-C reported:

> *We have a good university infrastructure here. If we need a special chemical analysis or other services, we have the resources here. We will approach the institutes and they run the analyses for us.* (Vice President Technical, L-C, trans.)

However, such services were required only occasionally, and in most cases they did not involve critical tasks. An intensification of such linkages to universities was impeded by the tight integration of the subsidiaries in the technical networks of their global MNEs, where many of the required measurement and testing services were carried out for the subsidiaries.

Linkages to universities for the purpose of knowledge generation have played only a very marginal role in the case studies. Universities were regarded as suppliers of human capital, but not of valuable knowledge. This was mainly owed to the distribution of responsibilities in the MNEs. Almost all basic research and most product development took place in the home markets. The subsidiaries in China and India were mostly focused on application and cost reduction tasks, which did not require collaboration with universities.

AC-C operates one of the most sophisticated R&D center in the case studies. Among other measures, it maintains linkages to two leading universities in Shanghai, where an expat manager of AC-C functions as advisor and part-time lecturer. However, the motive behind these activities is mainly to facilitate recruiting, and not to access new knowledge.

A R&D manager of AC-C explained:

> *We are starting development work at the moment. But it is more product-driven and mainly focused on cost reduction. [...] We are not responsible to develop a new generation of products. For that part you probably need more university cooperation.* (Senior Director Engineering S, AC-C)

Likewise AM-C did not maintain knowledge-seeking linkages to universities on the regional or national level. While the universities in Changsha offered only very limited relevant knowledge, the newly established R&D center of AM-C in Shanghai provided access some of the nation's top universities. However, due to the nature of R&D tasks assigned to AC-C, also this new center focused on gaining access to skilled graduates of Shanghai's universities, and not on entering in R&D collaborations with them.

Some of the R&D activities of L-C involved complex physics and chemistry. These activities might have benefited from collaborations with universities in the host environment. But also in this case, knowledge-seeking linkages to universities on the regional or national level could not be observed. Universities in Foshan and nearby Guangzhou did not offer much new knowledge to augment L-C's (and L-PARENT's) capabilities in traditional lighting technologies. In the emerging field solid-state lighting (SSL), however, the universities in Guangzhou and in particular in Shenzhen offered access to new technologies. Consequently, L-PARENT has directed considerable resources to its new R&D center in Shenzhen in order to monitor the developments there. The strength of neighboring Shenzhen in SSL technology has therefore deprived L-C from making progress in this field. Besides the investment in Shenzhen, L-PARENT maintained a small research lab at Shanghai's Fudan University. However, L-C was only loosely linked to this lab, and the interviewees did not observe that the lab had fostered the capabilities of L-C in Foshan.

Also in India, the subsidiaries did not enter knowledge-seeking collaborations with universities. The few product development activities that took place in India remained tightly integrated in the MNE network. The Indian universities were viewed as suppliers of talent, but not of new knowledge. As observed in China, this was mainly related to the nature of tasks assigned to the subsidiaries and less to the absence of relevant research infrastructure. For the application of existing products to customer requirements and local conditions, linkages to universities on the regional (or national) level were not required.

Regional physical infrastructure

Physical infrastructure was a particular problem in India. All three subsidiaries in India have encountered difficulties in road and rail transportation. While AM-I and AC-I in Bangalore

were able to access the ports of Chennai, L-I in northern India had no (economical) access to ports. According to the CEO of L-I, this constituted a major hurdle for the subsidiary:

> *If you have a manufacturing unit here in India and you want to ship material to Indonesia – just to take an example – you will find in most cases transportation time and cost prohibitively high to get the material moved in the country.* (CEO, L-I)

India does not only score poorly on transportation infrastructure, but also on other physical infrastructures. The reliability and cost of power supply, for example, constitutes another major hurdle to perform manufacturing operations in India. Most plants and offices maintain expensive power backup facilities to protect against interruptions of their work flow. The CEO of L-I reported:

> *Power availability is a bottleneck. [...] I cannot withdraw more than a certain amount. After then I have to run my diesel generator. [...] And this causes a lot of costs. In infrastructure, India has still a lot of catching up to do.* (CEO, L-I)

The plant of L-I is located two hours north of Delhi in an area with little industrial activity. In this location, physical infrastructure constituted a major disadvantage. The situation for AM-I and AC-I in Bangalore was more favorable, but still more challenging than the situation of its counterparts in China.

AC-C in the Yangtze River Delta and L-C in Pearl River Delta were located in very favorable locations. Access to the world market via ports and the domestic market were excellent. This has facilitated the in- and out-flow of materials and products, which was particularly critical for L-C with its export mandate. But also in China, transportation was sometimes a challenge. The Finance Director of AC-C reported:

> *In Europe we are used to highly efficient logistics providers: Reliability, speed, quality. And this does currently not exist in China. You always get surprises. I could argue that this has slowed us down.* (Director Finance, AC-C, trans.)

AC-C is located in the Suzhou Industrial Park (SIP). The SIP was established in 1995 in collaboration with Singapore, which provided expertise and funding. The SIP has provided AC-C with excellent facilities in terms of power supply, ICT connectivity, and housing and schools for employees and their children.

L-C in Foshan is located on the site of its former JV partner in the industrial heart of the city. While its physical facilities are not as supportive as the ones in Suzhou, the interviewees in the subsidiary have still described them as sufficient for the operation of their business. Bottlenecks in power or problems with transportation were rarely experienced.

The infrastructure and geographic location of AM-C in Central China is less supportive than the one of its counterpart in the coastal area. Being located more than 1,000 km from the next

port; exports to the world market were never an attractive option for AM-C. With regard to serving the automotive OEMs in the coastal area, the location in Changsha has generated higher transportation costs and reduced flexibility. But with regard to the emerging markets in Central and Western China (e.g. Chongqing and Chengdu), AM-C was well connected through roads, railway and waterways. Also power supply, ICT connectivity, and other means of infrastructure were readily available. As the only wholly-owned Western venture in Changsha, AM-C has enjoyed preferential treatment by city and provincial authorities (e.g. reliable power supply during nation-wide power shortages).

Regional policy and regulations

The impact of regional policy and regulations on the evolution of the researched subsidiaries has differed significantly between the two host countries and between different regions.

In China, provincial and city authorities have been very active to push the subsidiaries into higher value-add activities. This included a coupling of certain (investment) permissions to technology transfers and value-add in the region. In the case of AC-C, for example, authorities of the SIP initially put pressure on the subsidiary to localize R&D operations. However, the management of AC-C soon realized the strategic requirement to perform R&D in China and has therefore voluntarily expanded the scope of its R&D operations. Also L-C in Foshan has experienced pressure from city and provincial authorities to increase the value-add of its operations. In the course of a recent campaign of Foshan authorities to build a cluster for solid-state lighting (SSL) operations, the subsidiary was repeatedly pressured to transfer advanced activities in the field of SSL to its plant in Foshan.

Besides exerting pressure, regional authorities have also offered a range of incentives. This included subsidies or tax holidays for projects in the priority areas of regional economic plans. The *SSL strategy* of the city of Foshan, for example, offered tax holidays for firms investing in this new technology. This program has supported the efforts of L-C to convince managers of L-PARENT in Germany to transfer SSL activities to its Foshan plant.

Regional authorities have provided additional support to the subsidiaries in the form of preferential treatment in day-to-day interactions. In the case of AC-C, for example, the city administration in Suzhou and the authorities of the Industrial Park have been very supportive to the requirements of the subsidiary. The Finance Director of AC-C reported:

> *They are customer-oriented. This is the first time I have public servants asking me what they can do to facilitate my activities. For example when we need longer service hours for importing day and night.* (Director Finance, AC-C, trans.)

This favorable treatment was mainly related to the fact that AC-C contributed substantial taxes, technology, and reputation to the SIP and to Suzhou. Moreover, it was related to the fact that the initiatives of AC-C in the field of vocational training or environmental sustainability were highly appreciated by the authorities as a benchmark for other companies.

As the only wholly-owned Western venture in Changsha and a nucleus for the emerging automotive industry in Changsha and Hunan Province, AM-C has also received preferential treatment from city and provincial authorities. The Communications Director remembered:

> *From the very beginning when we […] decided to set up this entity in Changsha, we got a lot of support from the local government and from the industrial park on a daily basis. Whenever we needed support, they would give it to us as they could according to regulations and law.* (Director of Communications, AM-C)

Along similar lines, the General Manager of AM-C reported:

> *We maintain excellent relations to the government. We are one of the largest tax payers. We are preferred industry. And therefore we never had any problems*. (General Manager, AM-C, trans.)

Regional authorities involved AM-C in government consultations on which supplier industries should be promoted in the region and which infrastructure was required. As a role model for successful manufacturing operations in Changsha, AM-C has also received frequent visits from Party officials and delegations from neighboring province, which has further improved relations with city and provincial authorities.

The subsidiaries of both MNEs denied that pressure and incentives from regional authorities have resulted in an upgrading of operations (significantly) beyond what was deemed economical by the MNEs. But there was consensus among the interviewees that it has at least accelerated the speed of the subsidiaries' upgrading process.

Compared to these observations in China, the authorities in the two regions in India have played a more passive role. Both subsidiaries in India have not experienced strong pressure and/or incentives from regional authorities. Haryana state, where L-I operates its plant, is a comparatively well developed Indian state. Over the last decade, its authorities have established several special economic zones with good infrastructure and subsidized utilities. But until today, L-I has not benefited from any of these measures. Neither its industry nor its location has been in the focus of these initiatives. When L-I was to establish its new plant near Sonepat, state and city authorities were supportive in terms of permissions, land purchase, and infrastructure. But additional incentives or subsidies have not been made available. The CEO of L-I observed:

It is not that they [regional government] are interrupting our business. But the push [...] is missing: go for this and we give you subsidized power or lower taxes. (CEO, L-I)

The overall impression from the interviews is that regional authorities have neither substantially fostered nor impeded the evolution path of L-I.

The experience of AM-I in Bangalore was similar. While the authorities of the city and Karnataka state have not actively impeded an upgrading of AM-I's operations, they have also not made strong efforts to encourage it. The interviewed subsidiary managers could not remember substantial efforts of regional authorities to support the upgrading of the plant. In conflicts with the labor union on planned productivity increases in the plant, the authorities were torn between supporting the unions and the subsidiary. Naturally, the managers would have hoped for more active backing in these situations. But despite this lack of proactive support, the interviewed subsidiary managers did not try to blame the authorities for AM-I's sluggish evolution and weak track record in the MNE.

Subsi-diary	Location	Labor (unqualified)	Labor (qualified)	Labor (highly-qualif.)	Domestic suppliers	Competing & related firms	Infrastructure (research)	Infrastructure (physical)	Policy and regulations
L-I	Delhi/ Sonepat	◕	◔	○	○	◑	◑	○	◑
AM-I	Bangalore	◕	◑	◕	◔	◑	◑	◔	◑
AC-I	Bangalore	◑	◑	◕	◑	◑	◑	◔	◑
L-C	Foshan	◔	◑	◔	●	◕	◔	◕	◕
AM-C	Changsha	●	◔	○	◔	◑	◔	◑	●
AC-C	Suzhou	◔	◔	◔	●	●	◑	◕	●

○ Strongly impeding ◔ Impeding ◑ Neutral ◕ Supportive ● Very supportive

Table 11: Impact of regional configurations on subsidiary-driven evolution[38]

Source: Table provided by author.

4.5.4 Selected external relations

The impact of the location on the capabilities and initiatives of a subsidiary is not limited to a passive monitoring of (and responding to) external configurations, but might also result from interaction and learning in relations to external partners. Prior studies on *inter-firm business networks* suggest that external relations can shape subsidiary-specific advantages and consequently the weight of a subsidiary in the MNE network (ANDERSSON et al. 2007, PHENE and ALMEIDA 2008). External partners might therefore function as catalysts of a subsidiary-driven evolution trajectory. Scholars in Economic Geography emphasize the

[38] Qualitative assessment based on case study analysis. The table illustrates how regional configurations have affected the subsidiaries' ability and motivation to pursue initiatives to shape the evolution of their operations.

spatial character of inter-firm relations and stress that geographic proximity facilitates face-to-face interaction and thereby the exchange of (tacit) knowledge between firms. However, "*[…] geographical proximity may facilitate inter-organizational learning, but is neither a necessary nor a sufficient condition*" (BOSCHMA 2005: 71). Among others factors, cognitive and social proximity might also be important for inter-firm learning (BOSCHMA 2005).

This poses the question whether and how regional external partners have contributed to subsidiary evolution and whether and how this has been facilitated by geographic (and other forms of) proximity. In the following, this question will be investigated with the help of three exemplary relations of the subsidiaries to external partners.[39]

Example 1: Backward linkages to suppliers

Backward linkages to (regional) suppliers offer significant learning potential for MNE subsidiaries. They might strengthen a subsidiary's capabilities and reinforce its operations. The linkage of AC-C to a Suzhou-based supplier of machinery and equipment illustrates this:

Initially, AC-C imported all machinery and equipment from suppliers in Europe. In order to improve its cost competitiveness in China, it began to localize the sourcing of these strategic inputs to India. A mid-sized Suzhou-based firm (SA-C1) was selected as one AC-C's suppliers.

Besides the anticipated cost reduction related to cheaper input factors in India, it soon became apparent that the linkage to this supplier could offer a range of other advantages to the subsidiary. From interacting with SA-C1, AC-C learned about alternative materials and supply sources in China. A manager of AC-C provided an example for this: "*We were always focused on international brands (for equipment). When we visited the supplier, we noticed that they are using local brands, but also with a good quality. And this we learned from them*" (Manager Machinery, AC-C). This information exchange has helped AC-C to reinforce the competitiveness of its operations. Even more importantly, AC-C has benefited from the *low-cost mindset* of SA-C1's staff. The General Manager of AC-C observed that "*the supplier [*SA-C1*] has a sense for simple and smart solutions. […] We both learned from each other. After one year of collaboration, we found a smart way to integrate our ideas with the ideas of the supplier*" (General Manager, AC-C, trans.).

As a result of this close interaction and mutual learning, the cost of the localized machinery and equipment was reduced significantly below the levels of the imported machinery. Furthermore, the interaction with the supplier has inspired several process innovations in manufacturing and other areas of AC-C. These achievements have reinforced the reputation of AC-C in the MNE and have therefore supported the efforts of subsidiary managers to attract new mandates to their site.

The co-location of the two firms in Suzhou has supported these achievements, mainly because it has induced frequent visits of the firms' manufacturing and purchasing staff in each other's plants.

[39] In line with established case study procedure, the three relations were selected for the depth of insight they can provide, and not for their representativeness for the particular subsidiary or the entire population of MNE subsidiaries (YIN 2009).

According to the interviewees in both AC-C and SA-C1, this frequent interaction has reinforced social ties and mutual trust between the two firms and has thereby facilitated the joint improvement efforts and knowledge exchange.

The case of L-C in Foshan provides similar evidence with regard to the learning potential in backward linkages to domestic suppliers. One example for this is the experience of L-C with a supplier of basic materials in Foshan. The incompatibility of the supplier's materials with the machinery of L-C has encouraged joint efforts of L-C and the supplier to adjust the process parameters in the subsidiary. The expertise of this supplier in handling substandard materials has enriched the capabilities of L-C's engineers and has therefore facilitated optimization efforts also in other areas of the subsidiary. Likewise, the subsidiaries in India have also benefited from access to location-specific knowledge in their relations to domestic suppliers.

However, it is important to put this evidence for learning effects in backward linkages into perspective. In most cases the cost savings and process innovations associated with such learning effects were not significant, and a direct link to the upgrading of the subsidiaries' operations could not be established in any of the cases. However, by supporting the development of unique capability profiles in the subsidiaries, learning from domestic suppliers has strengthened the position of the subsidiaries in the MNE network and therefore also their bargaining power for resources and mandates.

Example 2: Forward linkages to customers

The six subsidiaries maintained more or less interactive forward linkages to customers and distributors in their host environments. A frequently cited benefit of these forward linkages was information about the business environment and market trends. Joint efforts with customers to improve the subsidiaries' products or develop new products might have offered the greatest learning potential. But such activities could only be indentified in few cases. One of these few cases was a joint development project of AM-I in Bangalore and an Indian automotive OEM (CA-I1).[40] This example will be looked at in some more detail below:

CA-I1 is one of India's major automotive OEMs and one of AM-I's oldest customers in India. The plant of CA-I1 is located in Nashik, Maharashtra. Most models of CA-I1 lack electronic control units to support sophisticated functionalities. The integration of a new fuel-saving system of AM-I into these models did therefore require an innovative solution. Although such kind of innovation was clearly beyond the mandate and capability of AM-I, its engineers took on the challenge.

[40] CA-I1 is a major Indian automotive OEM. The interviewed lead engineer and his team are located in a plant in Mumbai.

At the time the project started (2006), the Indian market and AM-I did not yet receive much attention from the MNE HQ. The project was therefore carried out mostly below the HQ's radar. This lack of formal integration into the R&D community of the MNE, together with the lack of expertise in both AM-I and CA-I1, has favored very close interaction of the two partners. Despite the several hours of travel between the firms, frequent meetings and knowledge exchange took place throughout the project. The lead engineer of CA-I1 reported that "*the interaction was almost on day-to-day basis. Either through phone or mail, or the teams used to come to Nashik or Bangalore. If there was a problem in the technology [...], both parties were looking for the solution together*" (Lead Engineer, CA-I1). This frequent interaction has strengthened social ties between staff on both sides and has fostered an open and constructive atmosphere throughout the project.

The project has followed a pragmatic *trial-and-error* approach, which was clearly not in line with the formal R&D process of the MNE. This was related to the lack of technical capabilities and experience of both partners as well as the lack of HQ involvement in the project. The pragmatic approach turned out as a key success factor of the project, because it allowed for a highly creative development process. The interviewees in AM-I were convinced that if the standardized R&D process of the MNE had been applied, the project would not have been so successful (and might even have been terminated long before finalization).

The final product was a commercial success and has recently been awarded an innovation award from an Indian industry association. By working closely with the OEM customer, the relatively inexperienced engineers of AM-I have been able to enhance their capabilities. HQ managers were not enthusiastic about the fact that the formal R&D process had been ignored. But nevertheless they viewed the project as a success and appreciated the innovative solution. This recognition has generated awareness for the capabilities of AM-I in the HQ. However, it remains to be seen whether this recognition will actually translate into an expansion of AM-I's formal R&D mandate.

The other case studies did not provide evidence for comparable innovative efforts (and learning effects) in forward linkages to customers. While the Chinese subsidiaries did also cooperate with customers, these efforts remained mostly limited to incremental product adjustments. New product development with customers was not observed in any of the cases.

Example 3: Horizontal linkages to firms and institutions

Competing and related firms in the same host country or region are often assumed to limit their interaction with each other to monitoring and comparing, as their rivalry restricts collaboration (MALMBERG and MASKELL 2006). However, firms might also find areas for cooperation, especially if their core technologies are not affected. Institutional shortcomings in emerging economies (e.g. in education and qualification) can be a particularly fruitful field for horizontal collaboration. The case of AC-C in Suzhou provides an interesting example for such horizontal collaboration with other firms in the regional host environment:

Like other MNEs operating in China, AC-C has suffered from a mismatch of its job profiles for qualified workers and the profiles available in labor market. This has encourage the subsidiary to initiated a vocational training program in collaboration with other German firms, the German Chamber of Commerce, regional authorities, and two public training institutes (Taicang and Wuxi). Some of the participating firms were in fact direct competitors. But in the case of AC-C, no direct competitor has joined the program.

The objective of the program was to improve the practical skills of graduates from the public vocational training institutes. In order to achieve this objective, the German system of *dual education* was transferred to China. In the new training program, about 60 percent of the time is dedicated to practical training in the participating firms, while 40 percent is dedicated to theoretical training in the public institutes. Training contents are based on German curriculums, and on completion of the program each student receives a certificate from the German Chamber.

While the German Chamber was mainly focused on managing the regional authorities and institutes, the German firms contributed training materials, part-time teachers, equipment, and funding to the program. AC-C, as one of the largest firms and co-initiator of the program, delegated a full-time program manager to the training institutes to coordinate the program.

After going live in 2007, the program proved to be a major success for AC-C. Most open positions for qualified workers in AC-C could now be filled with graduates of the program. The interviewed managers of AC-C were convinced that the rapid upgrading of its operations would not have been possible without joining forces with other firms to initiate this vocational training program.

Although all six subsidiaries engaged in some kind of vocational training efforts, the joint initiative of AC-C and other firms in the Shanghai area clearly stands out. L-C in Foshan and AM-C in Changsha have also cooperated with public vocational training institutes, but merely on a bi-lateral basis with limited exchange of knowledge, little government involvement, and no involvement of other firms. In the case of the Indian subsidiaries, vocational training took place mostly in-house rather than in collaboration with public institutes and other firms.

4.6 Conclusion

The aim of this chapter was to analyze the influence of external configurations and linkages on the evolution of MNE subsidiaries. In a first step, a conceptual framework was developed. The framework distinguishes between organizational and geographic dimensions as well as between different impact mechanisms which have so far been blurred in the literature on subsidiary evolution. With this fine-grained approach, the framework goes beyond prior conceptual attempts to capture the interface of subsidiaries and the external environment.

In a second step, this framework was applied to subsidiaries in China and India in order to investigate how exactly the external environment affects subsidiary evolution. The analysis

suggests that the nature of evolution drivers in the external environment and their impact on a subsidiary's evolution is more complex than commonly assumed in the literature on subsidiary evolution. The MNE-centric IB/Strategy literature with its underdeveloped concept of space and place does therefore fall short to fully grasp the phenomenon *subsidiary evolution*. By applying an in-depth approach to the interface of the subsidiary and the host environment, this chapter has contributed to reveal the microfoundations of subsidiary evolution.

First and foremost, the findings demonstrate how configurations on the national and regional level of the host country might influence the strategies and actions of the MNE HQ. In the case studies, both HQs demonstrated strikingly similar assessments of opportunities and challenges in China and India and of strategic implications for their subsidiaries. The most obvious implication was the allocation of more attention and resources to subsidiaries in China than to the ones in India. This unequal HQ support explains to a large part the differences in the evolution paths of the subsidiaries in the two countries. In both MNEs, the unequal HQ support was mainly related to the gravity of the large Chinese market. But also supplier markets, national and regional policy and regulations, and infrastructure were shown to influence HQ strategies and actions towards the subsidiaries.

Secondly, the findings demonstrate how configurations of the national and regional level of the host environment might contribute to the evolution of MNE subsidiaries by fostering subsidiary-level initiatives and capabilities. This mechanism further helps to explain the differences in the evolution paths in China and India. The size of China's market and the sophistication of China's supplier industries have favored the evolution of the Chinese subsidiaries of both MNEs. Shortcomings in these categories in India have impeded the upgrading of the Indian subsidiaries. While the availability of unqualified workers was in most cases sufficient, the (insufficient) availability of qualified workers and engineers has impeded the evolution of the subsidiaries across the different regions and MNEs. The availability of emerging-economy-specific capabilities was identified as another important driver of subsidiary evolution. The absorption of such location-specific capabilities has induced upgrading initiatives in at least some of the subsidiaries. By contributing to the unique profiles of the subsidiaries, such location-specific capabilities have strengthened their MNE-internal bargaining power.

Thirdly, the findings demonstrate that MNE subsidiaries do not merely react to configurations of the host environment, but interact and learn in embedded linkages to domestic partners. External linkages – in particular to domestic suppliers – were shown to facilitate the absorption of localized knowledge and to foster the competitiveness of the subsidiaries.

However, in none of the cases such linkages were found to have played a pivotal role in fostering the capabilities of the subsidiaries and in upgrading the technological sophistication of their operations. The unique capabilities profiles of the subsidiaries were mostly the result of hiring domestic staff and monitoring domestic firms rather than of learning in embedded linkages to external partners. This was to a large part owed to the limited mandates of the subsidiaries, which impeded knowledge-seeking linkages to domestic partners. This suggests that some of the recent network literature on the MNE (see e.g. PHENE and ALMEIDA 2008) might overstate the contribution of localized linkages to subsidiary evolution – in particular for subsidiaries in emerging economy environments.

Finally, the findings demonstrate that the analysis of subsidiary evolution can benefit from a more differentiated view on space and place. While HQ-level strategies were found to be dominated by factors on the global and national (host country) level (e.g. industry characteristics and market size), the capabilities and initiatives of the subsidiaries were heavily influenced by regional factors. The particularities of the regional labor market were found to constitute a pivotal enabling factor of subsidiary-driven upgrading dynamics. While agglomeration effects related to knowledge spillovers from competing and related firms were found to have supported some of the subsidiaries, the overall contribution of such effects to the evolution of the subsidiaries was limited. Counterevidence from case studies in other locations (e.g. AM-C in Changsha) suggests that the proximity to competing and related firms might not be necessary for successful subsidiary upgrading. Regional policy was also found to have induced subsidiary-level upgrading initiatives in some cases (predominantly in China). But in none of the cases critical events on the subsidiaries' evolution paths could be linked to policy. Wherever linkages to regional suppliers could be formed, geographic proximity was found to foster the localization of supply and the absorption of localized knowledge. But in line with prior findings, the most important linkages to domestic suppliers (as well as to other external partners) in the case studies were not predominantly *regional* (see e.g. MALMBERG and MASKELL 2006). Counterevidence from regions with weak supplier markets suggests that geographic proximity to suppliers might not be necessary for successful subsidiary upgrading. Bold HQ support as well as efforts to link to extra-regional partners was shown to compensate for weak regions. However, such a strategy impedes learning in localized relations and requires time- and efficiency-consuming workarounds. It is therefore questionable if subsidiaries can compensate weak regional environments in the long run.

5 Concluding discussion on the 'relative importance' of drivers

The discussion in previous chapters has demonstrated that of the six case studies, only the three Chinese units underwent a significant upgrading of their operations and MNE-internal roles. The two older Indian units stagnated or even underwent a relative downgrading of their operations and roles, while the third Indian unit has just recently stabilized its operations and offered only limited evidence for upgrading. These evolution paths were traced back to a range of driving forces in the subsidiary-endogenous, internal, and external environment. To conclude the discussion on subsidiary evolution, this chapter will discuss evidence from the case studies with regard to the *relative importance* of the various drivers.

5.1 Methodological considerations

The discussion of evolution drivers in previous chapters has assessed *how* and *why* particular configurations and relations have contributed to the evolution of the subsidiaries' operations. However, *how* and *why* a factor has contributed to an outcome is not identical with *how much* it has contributed to the magnitude of the outcome. The assessment of *how much* a particular environment or driver has contributed to the outcome is not trivial with the research design at hand, and has often been acknowledged as a weakness inherent to the case study approach (RAGIN 1997, GEORG and BENNETT 2005, EISENHARDT and GRAEBNER 2007, YIN 2009). However, assessing the relative strength of isolated variables in the context of an evolution path might be neither a realistic nor desirable aim of case study research. The very strength of case study research is that it can describe and explain incidences of (multiple) conjunctural causation in which "*[…] different causes combine in different and sometimes contradictory ways to produce roughly similar outcomes in different settings*" (RAGIN 1997: 33). In such cases of conjunctural causation, "*the magnitude of any single cause's impact depends on the presence or absence of other causal conditions [which] challenges the very idea of relative strength*" of isolated variables or causes (RAGIN 1997: 34).

In line with these considerations, this dissertation does not attempt to assess the relative strength of isolated variables (e.g. the exact causal weight of the regional labor market for the observed outcome), but rather to identify causal trajectories underlying the observed subsidiary evolution paths. A trajectory in this context is understood as a bundle of critical events and decisions, which can take on an ideal-typical HQ-driven character (e.g. top-down assignment of new mandates and operations), a subsidiary-capability-driven character (e.g. expansion of mandates and operations as a consequence of subsidiary-level upgrading

efforts), or a mix of both (BIRKINSHAW and HOOD 1998). However, one must keep in mind that subsidiary evolution is a temporal phenomenon and that the relevance of different drivers for the evolution of a particular subsidiary is likely to change over time along the evolving capabilities, requirements, and MNE-internal roles of the subsidiary.

Analytical procedures in case study research can help to reveal a critical path of events and to reveal the contribution of various environments to these events. With the help of the *temporal bracketing* method, the six case studies were therefore organized in different phases along major events and decisions (DAGNINO et al. 2008). With the help of *process tracing* (GEORG and BENNETT 2005) and *critical incidence technique* (HALINEN and TOERNROOS 2005), a specific causal evolution trajectory was identified for each case study. In the following, the findings of this exercise will be discussed.

5.2 'Relative importance' of drivers in the case studies

The analysis of critical events along the evolution paths of the three Chinese subsidiaries (L-C, AC-C, and AM-C) suggests that their evolution has predominantly followed HQ-level strategies and actions. The HQs of both MNEs demonstrated strong ambition to upgrade and expand their Chinese operations. Critical upgrading events (e.g. the establishment of Asia R&D centers in AM-C and L-C or the transfer of *Park Pilot* products to AC-C) were predominantly driven by HQ initiatives. The ambition of the HQs sometimes even went beyond the capacities of the subsidiaries at the time, which would have preferred a more gradual evolution process. However, the commitment of the HQs to upgrade their Chinese subsidiaries has not always been on such a high level, but has gradually increased together with the growing relevance of the Chinese market. When L-C was founded in Foshan in the late 1990s, for example, the market was still considered peripheral by most managers in L-PARENT, and the level of HQ attention to the new subsidiary was moderate. But since the Chinese market began to play a central role in the corporate strategy of L-PARENT in the early 2000s, the commitment of the HQ to foster the upgrading of L-C has increased tremendously. The pressure to succeed in the booming Chinese market, together with the realization that the specific requirements of this market will require localized operations in China was fueling the HQ-driven evolution paths in the case studies. This pattern was observed in both MNEs despite obvious differences in strategies and industry requirements.

Besides this strong *HQ-driven* character, collaboration and competition of sister subsidiaries in the MNE network has also contributed to the observed evolution paths by strengthening

subsidiary capabilities and motivating subsidiary-driven upgrading initiatives. However, the importance of such horizontal relations differed significantly between the evolutionary stages of the subsidiaries. The importance of relations to lateral sister subsidiaries in the same country was particularly important during the ramp-up phase, but was decreasing with growing maturity of the subsidiaries. The importance of relations to sister subsidiaries of the same BU was moderate during the ramp-up phase, but increased with the growing maturity and operational scope of the subsidiaries. Integrated subsidiaries with supply chain relations maintained more or less constant relations over the different evolutionary stages. The evolution of AM-C in China illustrates these patterns: As a late-mover in its MNE, AM-C was able to benefit from an existing network of lateral sister subsidiaries in China during its ramp-up phase. With growing maturity, interaction and knowledge exchange has shifted towards sister subsidiaries of the same BU on the national level and in Asia-Pacific. However, it is important to recognize that these patterns were not entirely owed to the evolutionary stages of the subsidiaries, but coincided with MNE-internal organizational changes at the time which have facilitated cross-border collaboration and competition in same-BU relations.

Although the three subsidiaries in China have maintained manifold collaborative and competitive relations to sister subsidiaries through their history, the analysis of the case studies suggests that the *relative importance* of these relations for the evolution of the subsidiaries' operations has been moderate. Important decisions and initiatives affecting the evolution of the subsidiaries were predominantly driven by the global HQ based on global strategy as well as local requirements of the individual subsidiaries and their respective markets. Although conflicting requirements with sister subsidiaries have sometimes demanded trade-offs from the HQ, such a competition with sister subsidiaries has not significantly altered the evolution paths of the three subsidiaries in China.

Besides this dominance of the HQ dimension, the capabilities and initiatives of the subsidiaries themselves have also influenced the evolution paths of the subsidiaries in China. With the gradual accumulation of sophisticated capabilities, the subsidiaries have gradually gained independence from the HQ-dominated evolution trajectory. They were increasingly engaged in localization and optimizations initiatives and made efforts to *pull* additional responsibilities from the HQ. In particular with regard to the R&D function, many of the interviewees could name a precise event when they felt that their subsidiary had reached beyond a certain threshold of maturity and confidence to shape the evolution of the subsidiary's operations more proactively. This accumulation of capabilities and confidence was at least partially the result of subsidiary-endogenous (training) efforts and the absorption

of knowledge from the host environment. With such an upgrading of the subsidiaries' capabilities and, at the same time, with the increasing contribution of resources and knowledge from the subsidiaries to the MNE, the one-sided dependence of the subsidiaries on the HQ was gradually replaced by a more interdependent relation. However, this interdependence might have weakened, but not entirely replaced the dominance of the HQ in the subsidiaries' evolution paths. This was mainly related to the fact that the upgrading of the subsidiaries' roles into *Development Specialists* (AM-C and L-C for Asia-Pacific) or *Product Specialists* (L-C for certain products) has constantly generated new requirements for guidance and knowledge transfers from the HQ. The importance of the HQ for the evolution of the subsidiaries has therefore remained on a constant high level, and a stronger *subsidiary-driven* character of the evolution (in the sense of BIRKINSHAW and HOOD 1998) was impeded.

The evolution paths of the two older subsidiaries in India L-I and AM-I provide an interesting contrast to these observations in China. The dominance of the HQ-dimension in the evolution paths of these subsidiaries was not as strong as in the Chinese cases. The lack of upgrading (and in some areas the downgrading) of these subsidiaries was the result of a combination of insufficient commitment of the two MNE HQs to foster the upgrading of the subsidiaries and the failure of the subsidiaries themselves to fill this vacuum with bold upgrading initiatives.

After few initial years of strong attention and support from the MNE HQs during the start up phase of the two subsidiaries, the commitment of the HQs to foster an upgrading of the subsidiaries faded in the late 1990s and early 2000s. This was related to the peripheral status of the Indian market at the time as well as to the MNE-internal competition of the Indian subsidiaries with sister subsidiaries in other emerging economies. The fact that some of these sister subsidiaries (in particular those in China) offered better returns on MNE investment has deprived the Indian subsidiaries from investment and mandates.

Due to this lack of HQ commitment, the evolution of the two subsidiaries until the mid-2000s was therefore to a large part determined by strategies and actions of the subsidiaries themselves (and – in the case of AM-I – of the national HQ). In fact, many of the important events affecting the product and value-add scope of the two subsidiaries at that time were based on initiatives of subsidiary management. However, in many cases these initiatives did not aim at upgrading the scope of the subsidiaries' in-house operations, but at achieving competitiveness through outsourcing to external partners. In some situations, the two subsidiaries have in fact proactively attempted to upgrade the scope of their operations (e.g. the lobbying for a second plant by L-I and the autonomous R&D activities of AM-I in the mid 2000s). However, owed to a lack of endogenous capabilities of the subsidiaries as well as

interest in the global HQ in the developments in India, these efforts did not give rise to a more dynamic *subsidiary-driven* upgrading path of the two subsidiaries.

Since very recently, both subsidiaries in Indian (and in particular AM-I) have experienced some upgrading of their operations. This development was closely related to the renewed interest of the MNE HQs in their Indian subsidiaries, which was a consequence of both the growth of the Indian market and the empowerment of global BUs in these MNEs. The increasing commitment of both MNE HQs to penetrate the Indian market more aggressively has given rise to (still moderate) HQ-led upgrading dynamics in the two subsidiaries.

The third Indian subsidiary, AC-I, has only recently evolved beyond a ramp-up of operations. The evolution of this subsidiary in the initial two years was determined by a top-down assignment of mandates and resources from the global BU. However, since the beginning of 2010 the (expatriate) management of AC-I has demonstrated increasing commitment to play a more active role in shaping the evolution of the subsidiary. Among other initiatives, it has initiated the transfer of certain operations from a Chinese sister subsidiary to AC-I in order to reinforce its value proposition to Indian customers. However, in its short history the subsidiary has not yet accumulated sufficient experience and capabilities to reduce its dependence on the global BU and to evolve towards a more *subsidiary-driven* evolution path.

The observation of mainly *HQ-driven* evolution trajectories in both MNEs and host environments might disappoint proponents of the modern MNE as a network of differentiated units which proactively generate knowledge and thereby earn significant levels of MNE-internal power and eventually *strategic independence* to shape the evolution of their operations (ANDERSSON et al. 2007). A combination of factors, some of them emerging-economy-specific, has favored this outcome in the case studies:

- The combination of dynamic growth and vast market size in large emerging economies such as China (and recently also India) generates pressure on MNEs to succeed in these markets. This motivates bold HQ-driven upscaling and upgrading, which leaves little room for a gradual, subsidiary-capability-driven evolution path.
- Likewise, the existence of emerging-economy-specific factor conditions (e.g. low-cost labor) and strategic assets (e.g. low-cost design skills) motivates bold initiatives of the HQ to enable its subsidiaries to access and absorb these localized assets.
- The occurrence of a HQ-driven evolution path also depends on incentive structures and power of HQ managers. The case studies demonstrate that the re-organization from cross-divisional national organizations towards global BUs has created a

situation in which HQ managers were both incentivized and empowered to drive a bold upgrading of their subsidiaries in China (and to a lesser extent in India).

At the same time, a combination of other factors has impeded a stronger *subsidiary-driven* character of the observed evolution trajectories:

- The lack of experience and expertise in the labor and supplier markets in emerging economies impedes the accumulation of sophisticated capabilities in MNE subsidiaries as well as the localization of their supply. Consequently, the subsidiary's dependence on the HQ for the fulfillment and expansion of its mandates remains high, and the accumulation of capabilities beyond existing mandates – an therefore a subsidiary-driven evolution path – is impeded.
- Weak institutional and regulatory frameworks (e.g. regarding IP- and trade-regimes) and high fluctuation in emerging economies create concerns in the MNE HQ whether or not to transfer knowledge and technology. Depending on the strategy and risk aversion of the MNE, the dependence of a subsidiary in such an environment on the MNE therefore remains high, and a subsidiary-driven evolution path is impeded.

Some of these factors (e.g. the importance of market size and growth for the level of HQ support) could be identified as important evolution drivers in both MNEs and host environments. These drivers (and the underlying mechanisms discovered in the cases studies) might therefore play an important role for subsidiary evolution also beyond the immediate case context. For other drivers, however, the case studies provide conflicting evidence. This includes the role of shortcomings in the national and regional host environment and the legacy related to the entry mode of the subsidiary. These factors were found to have impeded the evolution of L-I and AM-I in India, but much less so of AM-C in China. Conflicting evidence was also found with regard to the link between export activity and subsidiary upgrading: Subsidiaries with (L-C) and without (AC-C) export mandates were attracting similar levels of HQ attention and support, suggesting that a HQ-driven upgrading of subsidiaries may occur in both market- and export-seeking strategies. This conflicting evidence suggests that these factors are neither necessary nor sufficient conditions for the upgrading of MNE subsidiaries. However, as mentioned before, with the qualitative and exploratory research design applied, such generalizations about the necessity or causal weight of isolated drivers is neither a realistic nor desirable goal. The goal of this dissertation is rather to generate interesting insights into under-researched mechanisms of subsidiary evolution on different organizational and geographic levels and to provide indications and inspiration for further research.

Part C: Impact of MNE subsidiaries on the host environment

6 Impact of MNE subsidiaries on the host environment

6.1 Introduction

Understanding *why* and *how* MNE subsidiaries impact firms and institutions in the host environment is vital for both policy makers and MNE management. For policy makers, it helps to design policies and incentives to attract the *right type* of investment to the country or region and to induce effective spillovers to domestic firms. And for MNE management, it helps to optimize the benefits from linkages to domestic partners and to manage the consequences of their actions (e.g. to avoid reputational damage and adverse reaction from stakeholders) (MEYER 2004).

With the increasing relevance of MNEs for the international diffusion of knowledge and technology, a rich body of literature on MNE spillover effects has evolved since the 1960s. Earlier discussions in (neo-classical) economics found FDI to be generally welfare-enhancing for recipient locations (MCDOUGALL 1960). However, in the turn of the 1960s and 1970s, most scholars took a rather negative position towards the impact of FDI on the host environment (HYMER 1972, HOLM et al. 2003). MNE subsidiaries were assumed to be mostly restricted to standardized operations creating only few qualified jobs or technology spillovers and to increase the vulnerability and dependency of the host economy. But in the light of the adverse economic consequences of import substitution policies in Latin America and in a number of Asian countries, a more differentiated perspective on FDI proliferated and MNEs were increasingly viewed as important contributors to economic growth (BLOMSTRÖM and KOKKO 2001, DE BEULE and VAN DEN BULKE 2002). By interacting with institutions, organizations, and individuals, MNEs were found to offer potential for positive spillovers to various groups of stakeholders. Especially for developing economies with weak endogenous knowledge bases, such spillovers can be crucial for technological upgrading and economic development (BERGER and REVILLA DIEZ 2008).

Despite a rich empirical base, evidence for MNE spillover effects – especially in emerging economies – remains inconclusive and underlying mechanisms are not sufficiently understood (RODICK 1999, MEYER and SINANI 2009). A range of firm-level studies in recent years has attempted to provide more insights into the mechanisms of spillover generation and absorption (see e.g. MARIN and BELL 2006, GIROUD 2007, BEUGELSDIJK et al. 2008 IVARSSON and ALVSTAM 2010). However, several loose ends regarding spillover

channels and underlying mediating conditions remain. GIROUD and SCOTT-KENNEL (2006) therefore suggest that "*the avenue for future research […] lies in the type of linkages established and whether or not technology transfer takes place, as well as the conditions behind such transfers*" (GIROUD and SCOTT-KENNEL 2006: 14). This chapter follows down this research avenue by providing an in-depth, firm-level approach to the microfoundations of the external impact of MNE subsidiaries on the host environment.

The remainder of this chapter is arranged as follows: the next section summarizes the findings in the literature regarding spillover channels and mediating conditions. This is followed by a brief discussion of the methodology and data collection. Then the evidence for spillovers and underlying mediating conditions in the case studies is presented. The chapter is concluded with a discussion of key findings.

6.2 Literature review

Several literature strands can contribute to the analysis of how MNE subsidiaries generate spillover potential for domestic firms and institutions in their host environment, and how the recipients can make effective use of this potential.

The literature on MNE spillover effects has long been dominated by economists (GIROUD 2007). In highly aggregated studies, these scholars investigated the impact of MNE activity on productivity and innovative capabilities of domestic firms in the same or up- and downstream industries, and the conditions for such spillovers.[41] The findings of this literature provide a good starting for a more in-depth firm-level analysis of MNE subsidiary spillover.

International Business (IB)/Strategic Management literature can contribute to the analysis of MNE spillover effects by offering theoretical foundations for the generation of spillover potential by the MNE. However, it has so far demonstrated surprisingly little interest in the impact of the MNE on the host environment and has rather focused on knowledge flows within and into the MNE (MEYER and SINANI 2009). The past two decades have seen a revival of interest in geography and location in the IB/Strategy literature (see e.g. PORTER 1994, DUNNING 1998, CANTWELL and PISCITELLO 2005). With the growing awareness for competence-creating (and therefore home-base augmenting) subsidiaries and the recognition that such competences are often created in close interaction with local partners, the two-way spillover between subsidiaries and their host environment has received increasing research attention (MARIN and BELL 2006, CANTWELL 2009).

[41] See BLOMSTRÖM and KOKKO (1998) for a review of this literature.

Economic Geography literature can add a complementary (spatial) perspective to the analysis of MNE spillovers. It emphasizes the contribution of MNE subsidiaries to regional economic development by offering *global pipelines* to extra-regional knowledge and by helping to avoid technological and cognitive *lock-in* (BATHELT et al. 2004, HEIDENREICH and MATTES 2010). Economic Geography also offers insights into the role of geographic (and other forms of) proximity and absorptive capacity for effective spillover of knowledge between firms in the host environment (see e.g. BOSCHMA 2005, MALMBERG and MASKELL 2006). Furthermore, it can provide insights into the characteristics of knowledge generation in different industries (e.g. *analytical* and *synthetic*) and how this might affect the propensity for localized linkages to be created (ASHEIM et al. 2007, MOODYSSON et al. 2008).
Literature on *Global Production Networks* and *Value Chains* adds another complementary perspective to the analysis of MNE spillover effects (see e.g. GEREFFI 1994, ERNST and KIM 2002, GEREFFI et al. 2005, YEUNG 2006). With a focus on linkages between MNEs and domestic firms and related growth and learning opportunities for domestic firms and regions, this literature can contribute particularly to the analysis of the upgrading potential often associated with backward linkages of MNEs to domestic suppliers.

Most of the earlier research on MNE spillovers has focused on horizontal (intra-industry) spillovers. It has identified multiple channels for spillovers including demonstration effects, labor mobility, enterprise spin-offs, and competition effects, but also potentially negative effects such as a *crowing out* of domestic firms (BLOMSTRÖM and KOKKO 2001, GÖRG and GREENAWAY 2004). Despite considerable empirical efforts, many authors observe that evidence for horizontal spillovers in the literature remains inconclusive, and while "*policy literature is filled with extravagant claims about positive spillovers from FDI, […] hard evidence is sobering*" (RODICK 1999: 37). More recent studies confirm that only few studies could actually find a (positive) link between the presence of MNEs in the host economy and horizontal spillovers (see e.g. GÖRG and GREENAWAY 2004, GIROUD 2007, BEUGELSDIJK et al. 2008). This might be related to insufficient measurement techniques and data as well as to a range of context conditions not accounted for in the literature (MEYER 2004). However, according to JAVORCIK (2004), the lack of evidence for horizontal spillovers might also be due to the fact that "*researchers have been looking for FDI spillover in the wrong place*" (JAVORCIK 2005: 606). Subsidiaries might have strong incentives to prevent horizontal spillover of their knowledge and technology to competitors, but at the same time might tolerate or even foster vertical spillovers to up- or downstream

industries to benefit from higher efficiency and quality. Spillovers from subsidiaries might therefore be more likely to occur between sectors than within sectors (JAVORCIK 2004).

Other authors suggest that the inconclusive empirical evidence for horizontal spillovers might be related to the failure to distinguish between knowledge transfers in linkages to domestic firms and spillovers to otherwise unrelated firms in the form of externalities of a subsidiary's activities in the host environment (UNCTAD 2001, GIROUD and SCOTT-KENNEL 2006). While MNEs have good reasons to protect against random spillovers to competitors, they might nevertheless choose to enter alliances with selected competitors in the form of technology-sharing agreements or joint R&D projects. In most studies, however, such a voluntary knowledge transfer to partners is blurred with unintended spillovers to unrelated firms. Instead of broadly dismissing horizontal (intra-industry) spillovers, some studies therefore attempt to disentangle the different types of spillovers and to investigate spillover effects in linkages to domestic firms in greater detail (CHEN et al. 2004, GIROUD and SCOTT-KENNEL 2006).

Motivated at least partially by the inconclusive evidence for horizontal spillovers, many scholars have focused their attention on vertical spillovers to domestic firms in up- or downstream industries (JAVORCIK 2004, CRESPO and FONTOURA 2007, GIROUD 2007). In particular spillovers in backward linkages to domestic suppliers are seen as a promising learning opportunity for domestic firms. Such spillovers can result from the transfer of process and product technologies, the training of employees, or by offering assistance in raw material purchasing. More indirectly, higher requirements and standards imposed by the MNE on its suppliers can motivate initiatives to upgrade the efficiency and quality of operations. By serving the MNE subsidiary, suppliers might also grow their volumes and thereby reap economies of scale. And by linking into global production networks of the MNE, suppliers might benefit from additional learning effects and scale economies (JAVORCIK 2004, GEREFFI et al. 2005, IVARSSON and ALVSTAM 2010).

Spillovers in forward linkages to customers are mainly associated with the superior quality or cost of inputs provided by MNE subsidiaries as well as with the training of downstream firms (e.g. in sales techniques) (MEYER 2004, CRESPO and FONTOURA 2007).

Furthermore, spillovers from MNE subsidiaries might occur in collaborative arrangements with non-business actors. This can include joints efforts with educational or research institutions in an attempt to strengthen human capital in the region (MEYER 2004).

While several studies find evidence for productivity- and welfare-enhancing spillovers in backward linkages – at least in developed countries – evidence for spillovers to customers and non-business actors remains inconclusive (JAVORCIK 2004, BEUGELSDIJK et al. 2008).

Earlier literature on the external impact of MNE subsidiaries has viewed spillovers as a quasi-automatic process which is increasing with the technology gap between domestic and foreign firms in an industry (see e.g. CAVES 1974). However, the inconclusive empirical evidence for spillovers from developed to emerging economies suggests that other factors beyond the technology gap might determine effective spillovers (MEYER 2004). Consequently, many scholars have "*[…] turned their attention to demand-side explanations for the absence of positive effects; by looking at the possible absence of absorptive capabilities of domestic firm to explain the absence of positive effects*" (DANTAS et al. 2007: 25). Other conditions on the level of recipient firms (e.g. motivation) and regions (e.g. innovation systems) have also received considerable research attention (see e.g. JAVORCIK 2004, DANTAS et al. 2007, BERGER and REVILLA DIEZ 2008, BEUGELSDIJK et al. 2008).
Mediating conditions for spillovers have also been identified on the level of the MNE as the knowledge-originating firm. This includes the investment motive and technology sharing strategy of the MNE (JAVORCIK 2004, BEUGELSDIJK et al. 2008). Some studies depart from this HQ-centric view and focus instead on the capabilities and actions of the subsidiary itself in the context of spillovers. They find that MNE subsidiaries might play an active role in spillover generation (e.g. by proactively sharing their capabilities with external partners) and might not be passive, *leaky containers* as often observed in the literature (see e.g. MARIN and BELL 2006, MARIN and GIULIANI 2007). HOLM et al. (2003) emphasize that these conditions in the host environment, on the level of the subsidiary, and in the MNE network are closely interlinked. Sophisticated firms in the host environment, for example, might strengthen the capabilities of a subsidiary, which might attract additional mandates to this subsidiary and in turn reinforce spillovers to the host environment.

While empirical evidence for vertical spillovers from MNE subsidiaries is robust for developed country environments (at least for backward linkages to suppliers), it is highly ambiguous for emerging economy environments (BEUGELSDIJK et al. 2010). This suggests that research should take a closer look at emerging-economy-specific conditions for the generation and realization of spillovers in such locations. Firms and innovation systems in emerging economies such as China and India share some unique characteristics. The

sophistication of their institutions, human capital, supplier industries, and physical and infrastructure is likely to to lag behind the dynamic growth of their economies (ERNST and KIM 2002, BERGER and REVILLA DIEZ 2008). At the same time, however, these environments might feature favorable factor conditions such as low-cost labor or untapped market potential. Such emerging-economy-specific conditions can be assumed to affect both the potential for spillover generation and the ability of domestic firms and regions to effectively utilize this potential.

Prior studies suggest that the potential for spillovers is positively related to the technology gap between the home and host environment of the MNE. Emerging economies at lower (technological) development stages might therefore have more to gain from the presence of MNE subsidiaries (MEYER and SINANI 2009). But at the same time, a large technology gap might lower the absorptive capacity of recipient firms and institutions and therefore their ability to make effective use of the spillover potential, suggesting an inverse *u-shaped function* of technology gap and spillovers (MEYER and SINANI 2009).

Insufficient resources and infrastructure (e.g. regarding human capital and supplier industries) might induce MNEs to transfer only labor-intensive, unsophisticated tasks (e.g. assembly) to subsidiaries in these environments (BERGER and REVILLA DIEZ 2008). This could further reduce the potential for spillovers. Moreover, underdeveloped supplier industries might prevent the formation of backward linkages. MEYER and SINANI (2009) conclude that spillovers from MNE subsidiaries in emerging economies might therefore occur mainly through demonstration effects rather than through active knowledge- and technology-sharing between subsidiaries and domestic firms.

Furthermore, the competition effect associated with the entry of MNEs in a particular host environment might be less significant in emerging economies. With their expensive and high-quality products, MNE subsidiaries often focus on the premium segment of the host market (at least initially), while domestic firms might focus mainly on the mid- to low- segments. In such a scenario, the stimulating effect of competition (but also the risk of a *crowding-out* of domestic firms) is impeded (MEYER and SINANI 2009). The same might be true for efficiency-seeking subsidiaries with a focus on exports and therefore limited involvement in the domestic market (BLYDE et al. 2004).

Despite the existence of a rich body of literature on MNE spillovers, the microfoundations of *how exactly* MNE subsidiaries impact their host environment remain under-researched. This is particularly true for emerging economy environments (BEUGELSDIJK et al. 2008).

Inconclusive evidence in the literature might be to a considerable extend related to the aggregated nature of many studies and the insufficient coverage of mediating conditions. In fact, most empirical studies on MNE spillover effects operate on a highly aggregated level, which "*tends to mask underlying firm-level relationships (linkages) and thus processes of learning, capability building and growth occur within an unexamined 'black box'*" (GIROUD and SCOTT-KENNEL 2006: 4, emphasis in the original). MEYER (2004) finds that while "*the literature on vertical spillover is overwhelmingly confirmatory, […] our understanding how they occur on the micro level is limited*" (MEYER 2004: 264). Scholars should therefore focus on "*analyzing how spillovers arise in individual interactions of a multinational firm and a local […] firm*" (MEYER 2004: 264). Along similar lines, GIROUD and SCOTT-KENNEL (2006) observe that "*[...] there remains a lack of systematic examination of inter-firm […] linkages*" (GIROUD and SCOTT-KENNEL 2006: 4). Such an examination of inter-firm linkages cannot be limited to the observation whether such linkages exist (e.g. by looking at local sourcing ratios), but might require a firm-level examination of their actual impact on domestic firms (BEUGELSDIJK et al. 2008). Since the mid-2000s, several studies have followed this call for more in-depth, firm-level approaches to MNE spillovers (see e.g. BERGER and REVILLA DIEZ 2008, IVARSSON and ALVSTAM 2010).

The literature on MNE spillovers has also neglected important mediating conditions. Among other conditions, "*the FDI impact literature has paid scant attention to the diversity of business strategies that influence the type and extent of spillovers*" (MEYER 2004: 265). Only few studies link from the subsidiary as a regional actor to the global level of the MNE and therefore fail to capture the role of MNE strategy and organization for spillover generation on the regional level. The indirect impact of national and regional policy on the MNE's willingness to transfer knowledge to the host environment – and therefore generate potential for spillovers – has also not been accounted for in sufficient detail. And also with regard to recipient firms in the host environment, important mediating conditions have been neglected. Most studies treat these firms as passive recipients of knowledge and technology and do not account for initiatives and investments of domestic firms to make effective use of the spillover potential of MNEs in the host environment.

Finally, many of the in-depth studies on MNE spillovers base their assessment solely on subsidiary-level data. In a study on MNE spillovers in Malaysia and Vietnam, GIROUD (2007) bases his analysis on the subsidiary-managers' "*perception on how suppliers had improved as a result of dealing with their firm [the MNE]*" (GIROUD 2007: 166). He acknowledges that "*a detailed analysis of individual suppliers would provide a more objective*

and accurate assessment of *the impact of MNEs on suppliers*" (GIROUD 2007: 166). In fact, the combination of data from the knowledge-originating and knowledge-receiving organization can be assumed to generate additional insights into MNE spillovers.

6.3 Conceptual framework

In order to address (some of) the shortcomings in the spillover literature discussed above, this dissertation generates a comprehensive, in-depth account of spillover channels and mediating conditions in the case of six MNE subsidiaries in China and India. Following the conceptual approach of GIROUD and SCOTT-KENNEL (2006), the external impact of MNE subsidiaries is disentangled in impact via *linkages* to domestic firms and more general *spillovers* to unrelated firms and institutions. *Linkages* are further distinguished in vertical linkages to suppliers (backward) and customers (forward), horizontal linkages to competitors, and linkages to non-business actors (e.g. universities). The mediating conditions for these spillovers are discussed on the level of *knowledge-originating* firms (MNE and subsidiary) and *knowledge-receiving* firms and institutions.

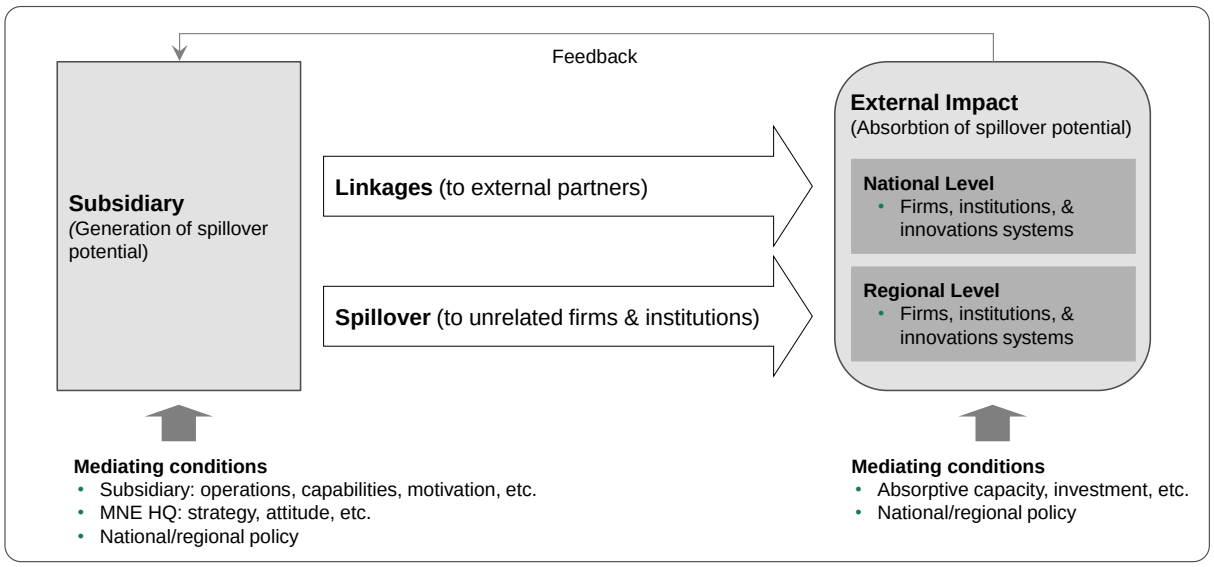

Figure 12: Conceptual framework for the external impact of MNE subsidiaries

Source: Figure provided by author.

6.4 Research design and data collection

Recognizing the lack of in-depth understanding of the microfoundations of MNE spillover effects on the level of the knowledge-originating and -receiving firm, an exploratory case study design was applied. The analysis builds on evidence from six in-depth case studies on

subsidiaries of two German-based MNEs in China and India. The cases studies are based on 90 semi-structured interviews in the MNE subsidiaries and their HQs, eleven interviews with domestic partner firms as well as secondary data sources.

Interviews in the subsidiaries included a range of questions regarding external linkages and spillovers. The questions differed depending on the respondents' functions. Purchasing managers, for example, were asked to describe their activities to support domestic suppliers and how they perceived the impact of these activities on these suppliers. And R&D managers were asked to describe their activities with domestic universities and firms and to estimate the impact of these activities on these respective organizations. Interviews with the external partners focused on channels for knowledge and technology transfers from the subsidiaries and whether and how these spillovers translated into an upgrading of external partners.[42]

The selection of external partners is heavily biased towards suppliers. Restricted access to customers and the absence of (strategic) linkages to competitors and research institutions in most of the case studies has impeded a more comprehensive account of the subsidiaries' external network. However, the focus on suppliers is well in line with prior findings in the literature which identified backward linkages to suppliers as the primary channel for spillovers from MNE subsidiaries (MEYER 2004, GIROUD 2007). The analysis of forward-, horizontal-, and non-business-linkages is mainly based on the perception of subsidiary and HQ managers regarding their impact on such external partners. The interviewees were asked to underpin their observations with detailed examples in order to get an indication of the magnitude of impact as well as of underlying mechanisms. To calibrate these observations to a certain extent, additional in-depth interviews with an important external customer in India (CA-I1) and with the German Chamber of Commerce and a vocational training institute in China were carried out.[43]

The analysis of spillovers to unrelated firms and institutions in the host environment is based on the perceptions of interviewees in the subsidiaries and the HQs as well as on secondary data sources regarding regional and national configurations and industry trends.

With this data collection procedure, this dissertation can provide an in-depth, firm-level account of the mechanisms underlying MNE spillover. The capacity to generalize findings to the population of MNE subsidiaries and/or the emerging economies, however, is limited.

[42] Interviews with external partners were conducted with the General Manager or senior managers in manufacturing.

[43] CA-I1 is a major Indian automotive OEM. A phone interview (60 minutes) was conducted with a senior engineer of the Mumbai and Nashik plants of the OEM. In the German Chamber of Commerce in Shanghai, an interview (90 minutes) was conducted with the department head for recruiting and training. In the vocational training institute in Taicang near Shanghai, an interview (30 minutes) was conducted with the manager of the joint training program with A-PARENT.

Supplier	Location	Customer	Distance (road travel)	Supplier since	Products and services	Export	Share of business
SL-I1	NCR - Delhi	L-I	3-4hs	2000	Metal components	Yes	25-50%
SL-I2	NCR - Rajasthan	L-I	5-6hs	1998	Metal components / wires	Yes	n/a
SL-I3	NCR - Delhi	L-I	2-3hs	2000	Electrical components / assembly	No	>50%
SA-I1	Bangalore	AM-I	1h	2001	Mechanical / electrical components	Yes	25-50%
SA-I2	Bangalore	AM-I	>24h	2002	Mechanical components	No	n/a
SL-C1	Suzhou	L-C	1h	2000	Electrical components	No	>95%
SA-C1	Foshan	AC-C	1h	2006	Mechanical parts / equipment	Yes	25-50%
SA-C2	Hangzhou	(AM-H)	1h	2005	Mechanical components	No	25-50%

Table 12: List of selected external suppliers

Source: Table provided by author.

6.5 Evidence for external impact in the case studies

In the following, the findings regarding the external impact of the researched subsidiaries on domestic partners as well as on unrelated firms and institutions in the host environment will be presented. In line with the conceptual framework laid out above, the analysis will distinguish between *linkages* to domestic partners (backward, forward, horizontal, non-business linkages) and *spillovers* to unrelated firms and institutions.

6.5.1 Linkages to domestic partners

6.5.1.1 Backward linkages to suppliers

For the six researched subsidiaries, the localization of supply was a strategic imperative to improve their cost position in the domestic market as well as in the MNE-internal network. The degree of localization, however, differs significantly between the subsidiaries. The oldest subsidiaries in China (L-C in Foshan) and India (AM-I in Bangalore) are already sourcing up to up to 80 percent of their purchasing volume in the host country. The youngest subsidiary (AC-I in Bangalore) is still largely depending on imported materials and components. These differences in localization ratios depend on a range of internal and external factors including MNE policy, age and scale of the subsidiary, and availability of local suppliers. But the degree of localized sourcing does also differ within each subsidiary depending on the type of product. In the case of AC-C, for example, nearly all electronic components are imported while 80 percent of mechanical components are sourced locally.

When MNEs decided to localize their supply in the host county, it does not necessarily involve domestic firms. MNE subsidiaries might prefer to source from the local plants of

multinational suppliers with experience in the developed markets – especially when the final products are to be sold in these locations. In this dissertation, however, the focus is on linkages to domestic suppliers, which can be assumed to induce greater benefits (e.g. in terms of technological upgrading) to the host environment than linkages to fellow MNEs.

The localization of supply by MNE subsidiaries is often accompanied by a transfer of knowledge. In the case studies, this knowledge transfer was found to be induced by indirect demonstration and motivation effects as well as direct supplier development efforts.

Domestic suppliers were found to benefit from demonstration effects in day-to-day interactions with MNE subsidiaries. Such demonstration effects include the observation (and absorption) of organizational and technical best practices (e.g. lean manufacturing or quality management). The General Manager of SL-I1, a supplier of L-I in Delhi, reported:

> *There were many technical discussions. We visited them in different plants many times to see their processes and to understand their requirements. This has really helped us to gradually improve the processes in our plant.* (General Manager, SL-I1)

Along similar lines, a purchaser of AC-C in Suzhou observed:

> *The reason why many suppliers want to have business with us is not only because of profits, but because they get know-how. When they do business with us and communicate with our engineers, they can also have a look at our lines. And this helps them to improve.* (Purchaser Materials, AC-C)

The high quality standards of the MNEs have a motivating effect on domestic suppliers. All of the interviewed suppliers have at least initially struggled to meet the requirements of the MNE subsidiaries. This has encouraged continuous optimization and upgrading efforts of the suppliers. The General Manager of SL-I3, a Delhi-based supplier of L-I, reported:

> *Our set up was not equipped as for [L-PARENT's] standards. Getting all the products right was difficult initially. But then slowly we have integrated our set up with their kind of technology and process controls. […]Whatever we did not know at the time we would ask them and they would guide us further.* (General Manager, SL-I3)

Another supplier of L-I in Northern India (SL-I1) confirms this experience:

> *The requirements [of L-PARENT] were difficult. We were used to different standards. We had to take steps to develop the product. We had to invest in machinery, raw material quality, training, and process changes.* (General Manager, SL-I1)

The interviewed suppliers in China reported about similar challenges to meet the relatively high product and process requirements of the MNE subsidiaries.

The challenging standards of MNE subsidiaries often included the requirement for professional certifications (e.g. ISO quality management system). Some of the suppliers had

obtained such certifications already before working for one of the two MNEs, because they were also increasingly required by domestic customers in China and India. But at least some of the smaller suppliers were required by L-PARENT or A-PARENT to obtain one or several of such certifications. In particular the suppliers to the automotive industry were pressured to obtain professional certifications (in particular the specialized ISO/TS 16949 certification). Despite considerable resource requirements associated with such certifications, the interviewed suppliers could also find some positive side effects for their capabilities and operations. The Lead Engineer of a Suzhou-based supplier of AC-C (SA-C1) reported:

> *Their [AC-C] purchasing team required us to get the ISO quality certification system. We just finished it by this month. This has clearly helped us to better organize our processes. And it will also help us to generate business with other clients in India.* (Lead Engineer, SA-C1)

The suppliers of L-C and L-I in the lighting industry were also required to acquire international (quality) certifications – if not already in place. For L-C's lighting business with multinational automotive OEMs, requirements were particularly strict. OEMs in the automotive industry typically require their *tier-one* and *tier-two* suppliers (and sometime even further down the supply chain) to acquire *ISO/TS 16949* certification to ensure quality and delivery (SROUFE and CURKOVIC 2008). Consequently, L-C as a *tier-one* supplier to the automotive OEMs asked its own suppliers to acquire this certification. In order to ensure successful (and at the same time fast and economical) implementation, L-C's engineers have provided advice and training to some of their suppliers during the certification process.

Besides this *indirect* (and at least partially unintended) transfer of knowledge in backward linkages, the suppliers have also received *direct*, proactive support from the MNE subsidiaries. Such proactive support was found to have played a central role for the observed upgrading of (some of) the domestic suppliers. The *supplier development programs* of the two MNEs typically included the evaluation of a supplier's processes and equipment and the design and monitoring of upgrading plans for each supplier. In some cases, such programs also included the transfer of technical details on products and processes and active support in improving a supplier's process efficiency and quality.

While all subsidiaries engaged in some kind of supplier development, significant differences could be observed between the two MNEs. The subsidiaries of A-PARENT were particularly active in supporting suppliers.

A manufacturing manager of AC-C in Suzhou reported:

> *We engage in comprehensive, sustainable supplier development programs. Sometime ten of our people will work at the supplier's site to jointly optimize their processes. […] Depending on their level we help them to improve their quality significantly with the help of technical procedures and qualification. We work on improving productivity and therefore cost, on how to organize lean production, and on reducing inventory and cycle time and improving flexibility.* (Vice President MFG S, AC-C, trans.)

AC-C also offered training to some of its suppliers' staff. The same manager reported:

> *We qualify key personnel of our suppliers on a regular basis, including the CEO. These people take the know-how back and implement it.* (Vice President MFG S, AC-C, trans.)

This development effort of AC-C went significantly beyond what is offered by A-PARENT to suppliers in the home market. It was required due to the relative underdevelopment of China's supplier industry and the significant technology gap between the subsidiary and the suppliers. The Lead Engineer of one of AC-C's domestic suppliers in Suzhou (SA-C1) confirmed that AC-C's engineers had frequently visited its plant to evaluate its operations and to give (sometimes binding) suggestions concerning product or process improvements or the purchase of new equipment and machinery. AC-C also provided detailed technical specifications of the components to be manufactured, which was experienced as very helpful by the supplier to improve the quality of its products.

Also AM-C in Changsha engaged in proactive supplier development. Despite the large physical distance to its suppliers (most suppliers locate up to 1,000 km far away on the East Coast), AM-C's engineers defined a detailed upgrading plan for each supplier and monitored its implementation closely. Especially during the early phase of new supplier relations, purchasing and/or process engineers of AM-C spent weeks or even months at the suppliers' plants to ensure a rapid and successful upgrading process. This bold effort has benefited the subsidiary in the form of reliable quality and delivery from these suppliers.

The supplier development efforts of A-PARENT in India did not differ significantly from activities in China, as they followed largely global standards defined by the HQ. In the case of AM-I in Bangalore, for example, the localization of component supply was accompanied by considerable efforts to upgrade domestic suppliers. And also the outsourcing of certain assembly tasks to domestic firms in the early 2000s was accompanied by trainings and technical support for domestic suppliers. A purchasing manager of AM-I reported:

> *Initially it was difficult to find suitable suppliers. System-, process-, and quality-wise, they had to be comparable with us. A team of purchasing and quality guys would go there, assess their site and assist them with improving their capabilities.* (Manager Purchasing, AM-I)

In some cases, AM-I did even transfer machinery and equipment to its suppliers in order to ensure constant quality and delivery. A manufacturing engineer of AM-I reported:

> *Our engineers spent a lot of time at the suppliers. […] We had to develop them. In most cases we even gave them machines and trained them. […] But now some of them have upgraded and got new machines.* (Senior Manager Engineering & MFG, AM-I)

The General Manager of SA-I1, a Bangalore-based supplier of AM-I, confirmed these bold development efforts of the subsidiary. Among other measures, some of his engineers had been invited to the lead plant of A-PARENT in Germany to be trained in sophisticated manufacturing processes. AM-I's engineers were also reported to have introduced new quality management techniques to the supplier. The General Manager of SA-I1 concluded that the supplier development efforts of AM-I had gone significantly beyond the efforts of any other firm the supplier had worked for. This matches the perception of HQ managers of A-PARENT, who described supplier development as a key element of their strategy.

Compared to these comprehensive efforts of A-PARENT, the subsidiaries of L-PARENT took a more reserved stance. The interviewees in the subsidiaries and the suppliers agreed that a proactive transfer of know-how and technology from the subsidiaries to their suppliers had not been common in the past. In particular L-C in China restricted its support to qualified feedback on the supplier's performance. Most of L-C's efforts focused on the initial phase of the relationship to ensure that the required quality level is reached quickly. But continuous improvements in cost and efficiency, which were often part of the sourcing contract, had to be achieved by the supplier alone. A quality manager of L-PARENT stated:

> *[L-PARENT] has limited resources for this supplier-quality management. Usually we evaluate our suppliers once a year. And if he scores poorly we will chose another one. The active development of suppliers is not common. [...] This is a weakness. It requires a new organization.* (Manager Global Quality, L-PARENT, trans.)

A long-time supplier of L-C in Foshan, SL-C1, confirmed this observation. The General Manager of this supplier reported that his firm had received less support from L-C than from some other MNEs it had worked for. Since very recently, however, a new comprehensive outsourcing contract between L-C and SL-C1 has encouraged efforts from the subsidiary (and from one of its sister subsidiaries in the region) to upgrade the supplier's manufacturing lines and the capabilities of its staff. The General Manager of SL-C1 reported:

> *In the past we did not have this communication. They [L-C] did not really send guys here or give training. But now we cooperate more closely. The new components are more high-level, and so they want to have stricter process control. This way we can learn more.* (General Manager, SL-C1)

Other interviews in L-C and in its HQ in Germany suggest that the experience of SL-C1 might stand for a general trend in L-PARENT towards proactive supplier development.

Compared to L-C in China, L-I has been more proactive in developing its suppliers. The purchasing head of L-I described the efforts of the subsidiary as follows:

> *Every year we have an audit plan for all suppliers. During the audit we suggest them how to improve their productivity. […] There is help from our technical people and from the plants in Germany. They visit here and give guidance.* (Senior General Manager Purchasing, L-I)

The General Manager of SL-I1, a Delhi-based supplier, confirmed this assessment:

> *They were very helpful in creating new products with us and telling us how to improve the quality and to reduce cost. […] Almost on a weekly basis a quality person or someone would visit us or we visit their plant.* (General Manager, SL-I1)

Along similar lines, another supplier of L-I (SL-I3) in the National Capital Region reported:

> *They were guiding us how to acquire ISO certifications. Their personnel would be in our factory all the time. They would have various formats for inspection […] and for process controls. And they give guidance how to integrate this in our system. So we had a very in-depth guidance by [L-I] personnel.* (General Manager, SL-I3)

These proactive supplier development efforts as well as more indirect impact mechanisms have benefited the domestic suppliers in manifold ways. First and foremost, the suppliers have benefited by expanding the value-add **s**cope and technological sophistication of their operations. The case of a Bangalore-based supplier of AM-I, SA-I1, provides a good example. For more than a decade now, this supplier has provided assembly services to AM-I. When AM-I decided to outsource parts of its value-add in manufacturing in the early 2000s, the operations of SA-I1 were upgraded from basic sub-assembly to full-product assembly. This has drastically increased the complexity in the supplier's operations in both technical and organizational terms. The capabilities and processes of the supplier at the time were not sufficient to meet the requirements. It was therefore necessary to train its staff, upgrade its equipment, and establish additional production lines in its plant for the new value-add steps it had taken over from the subsidiary. This included the introduction of a sophisticated *induction welding* process – a novelty to the supplier at the time. Experts of AM-I and A-PARENT provided comprehensive support during this upgrading process. Among other measures, some of the supplier's engineers were invited to the lead plant in Germany to monitor its processes. Additionally, some state-of-the-art machinery and software-based process management tools (e.g. *Failure Mode and Effects Analysis*) were imported from A-PARENT to the supplier, which has enhanced its technological capabilities and helped it to improve its quality.

A supplier of aluminum components to L-I in Northern India (SL-I1) underwent a similar upgrading of its operational scope in the course of its linkage to the MNE. In order to meet the challenging quality and cost requirements of L-PARENT, this supplier has invested heavily in new machinery and in expanding its in-house value-add. In one situation, the supplier has proactively invested in new machinery from Europe to facilitate the localization of certain components L-I used to import from suppliers in Europe. L-I has supported this investment of the supplier by offering guaranteed volumes and technical support.

Despite these and other success stories, the interviews with domestic suppliers revealed that an upgrading of suppliers in backward linkages to MNEs does not happen automatically and in every case. A longtime supplier of AC-C in Suzhou (SA-C1), for example, has failed to upgrade the scope of its operations. While it did benefit from some process and efficiency improvements that can be attributed to spillovers from the subsidiary, it did not upgrade its product portfolio and value-add scope over time. A supplier of L-C in Foshan, SL-C1, has even downgraded the product and value-add scope of its operations as a result of its business relations with the subsidiary. The operations of this formerly comprehensive lighting manufacturer were stripped down over time to a single assembly step. This was related to the large quantities and scale-related efficiencies required by L-C, which left little room for the supplier to engage in additional activities. When the supplier entered into a purchasing alliance with L-C, it stopped to interact with its own suppliers. Moreover, its competences in product design faded during the relationship with the subsidiary since L-C preferred to rely on its in-house design capacities. The General Manager of SL-C1 reported:

> *In the beginning we designed for [L-C]. But now they have their own low-cost design skills. They design the product for us and we assemble. This way, they think, they have better control over the design process.* (General Manager, SL-C1)

By terminating these and other value-add steps, the supplier has drastically weakened its strategic position in the market. However, of all selected suppliers this was the only example for such a *lock-in* in linkages to MNE subsidiaries, and the majority of domestic suppliers were in fact found to have upgraded their product and value-add scope from working with the MNEs. This upgrading, however, must be put in perspective. Despite several success stories, the researched suppliers have largely remained on the lower end of the potential upgrading path for developing-country firms suggested in the literature on technological upgrading (i.e. from assembly to original design or brand manufacturer) (e.g. see HOBDAY 1995).

With the rapid growth of the subsidiaries' business in the host country and the accelerating localizing of supply, the researched suppliers have expanded the scale and geographic scope of their operations over time. The rapid growth of a component supplier of AM-I in Bangalore, SA-I1, for example, was almost entirely driven by the thriving demand of the MNE subsidiary. The purchasing head of AM-I reported:

> *There is real growth in his [SA-I1] business. Two years back, he was having only a very small plant. But because of our quantity and the guaranteed business we are giving him he now has two larger plants.* (Manager Purchasing, AM-I)

The Lead Engineer of SA-C1, a Suzhou-based supplier, reported about similar growth dynamics as a supplier of the booming AC-C plant. The growth in volumes supplied to subsidiary has generated scale economies in the supplier's operations and has therefore improved its competitiveness.

Some of the suppliers have grown their business even further by securing orders from the MNEs' other subsidiaries in China and India as well as from the MNEs' international plants. A component supplier of AM-I in Bangalore (SA-I1), for example, expanded its business to other subsidiaries of A-PARENT in India and to plants in Germany and Brazil. In particular its delivery to the plant in Brazil has grown dynamically since 2008. Today, this export business constitutes a significant share of the supplier's overall business. Similarly, SL-I2, a supplier of components and wires to L-I in Sonepat, grew its business beyond national borders and is today serving several plants of L-PARENT around the world. The manufacturing head of the supplier reported:

> *We started exporting eight years back. […] It was just to one plant in Germany. But now there are more and more plants. […]The larger part of our business with [L-PARENT] is now with their overseas plants.* (Head Manufacturing, SL-I2)

Another supplier of L-I (SL-I1) reported about similar plans to grow its exports to the MNE:

> *At the moment our export business to [L-PARENT] would be only five to ten percent of our total business with them. [...] But as we are expecting the qualification of new products to come through, we expect the export business to become five times [sic].* (General Manager, SL-I1)

Also in China, some of the suppliers have succeeded in acquiring mandates from international MNE plants. A Suzhou-based supplier of manufacturing tools (SA-C1) for AC-C, for example, has expanded its manufacturing plants twice in the past two years after having won several export contracts with a plant of A-PARENT in Germany.

However, despite these and other successful examples, not all suppliers have expanded their reach into the MNEs' global value chains. A Delhi-based supplier of L-I (SL-I3), for example,

has repeatedly failed to qualify for global contracts with L-PARENT. Similarly, a supplier of L-C in Foshan (SL-C1) has remained almost entirely focused on serving the Chinese plants of L-PARENT. The conditions underlying this failure to expand the geographic scope of the suppliers' business with the MNEs will be discussed in a dedicated section on mediating conditions below (*chapter 6.6*).

The expertise and reputation acquired from working with the MNE subsidiaries has helped the suppliers also with regard to their third-party business. A purchaser of AC-C reported:

> *One of the suppliers worked with [AC-C] from the beginning. […]They are located at local distance. So they come here to discuss about the drawings and to get technical know-how. Gradually they learn our advantages and expectations. And with this they know how to make business with the rest of their customers. So gradually they get bigger and bigger.* (Purchaser Materials, AC-C)

The General Manager of AC-C made a similar observation:

> *[...] our internal machine building division works closely with local suppliers. Once you develop one, it becomes the preferred supplier in the entire region. This is a double-edged sword for us. We do not want disseminate our know-how to third parties. But as long as this is about ordinary machine building activities, we see it as some kind of development aid to the region.* (General Manager, AC-C, trans.)

A Bangalore-based supplier of AM-I (SA-I1) confirmed this observation. The strict quality requirements of A-PARENT and the regular auditing of SA-I1's manufacturing lines have help the supplier to acquire business with other MNEs in and beyond India. For business with the more cost-sensitive Indian customers, however, the experience was ambiguous: while some Indian customers appreciated the *international standard* of their processes and products, others were skeptical whether the investments made by SA-I1 in upgrading its operations to higher standards would be worth the premium on its products.

A similar example was observed in the case of a supplier of L-I in India – SL-I2. In line with the global standards of L-PARENT, L-I has required this supplier to reduce the amount of lead in its products. Since the Indian government has announced that regulations on toxic substances in lighting will be tightened for the time after 2012, SL-I2 has been in a very comfortable position of being ahead of most domestic competitors with its lead-free products. This advantage has helped it to acquire new business with other customers in India.

Besides such benefits related to high MNE standards, the purchasing head of L-I emphasized the reputational gains for domestic suppliers related to working with MNEs:

> *All firms in the lighting industry want to work with a multinational company. Because once you are an approved supplier, then your local business is easier. A number of suppliers ask me for just one order. […] Based on this one order they can get 1,000 orders from other customers.* (Senior General Manager Purchasing, L-I)

Of the interviewed suppliers, only one has failed to expand (or even maintain) third-party business while working with the MNE subsidiaries. SL-C1, a Foshan-based supplier of assembly services to L-C, has developed a strong dependence on the subsidiary over the past decade. L-C's rapidly increasing demand has fully occupied the supplier's capacity. But for a variety of reasons (e.g. risk aversion of management), the supplier has failed to expand its capacities to make room for third-party business. As a result, the supplier is relying on L-C for up to 95 percent of its revenue. But this case was an exception in the case studies. A similar *lock-in* of suppliers in linkages to the MNEs was not observed elsewhere.

6.5.1.2 Forward linkages to customers

The six researched subsidiaries maintained manifold interfaces to domestic customers and distributors. Besides *arm's length* commercial interactions, some of these interfaces developed into more interactive, long-term relations. The case studies demonstrate that such forward linkages can induce a spillover of the MNEs' expertise in areas such as supply chain management and quality control.[44]

One example for such spillovers is the integration of domestic customers of AC-C in China into the MNE's quality control system. By interacting closely with AC-C in the area of logistics and supply chain management, the customers have monitored and adopted a range of best practices. Another example for such spillovers is the effort of AC-C and AM-C to integrate their products into their customers' vehicles. In many cases, this has required a transfer of technical and managerial knowledge to customers, for example in the form of trainings to the customers' staff. The interviews in other subsidiaries revealed similar examples for the (intended as well as unintended) spillover of some of the MNEs' best practices in forward linkages to customers. However, while these spillovers have certainly generated benefits for the customers, the interviews provide tentative indication that the spillovers have not substantially improved their competitive position.

[44] However, the evidence presented here could not be verified with comprehensive data from domestic customers. The findings should therefore be seen as indications of spillover and learning mechanisms in forward linkages rather than as solid evidence for the (magnitude of) impact on domestic customers.

From the perspective of technological upgrading, the most promising learning potential for domestic customers might lie in joint development activities with their multinational suppliers. However, the case studies provide only few examples for such activities. One of these few examples is the effort of AM-I in Bangalore to develop a new product together with an Indian automotive OEM (CA-I1).[45] In order to integrate a new product of A-PARENT into the customer's vehicles, a new electronic device had to be developed. The HQ of A-PARENT was only loosely involved in the project. This lack of HQ involvement, together with the lack the expertise in AM-I, has induced frequent interaction and knowledge exchange with the customer throughout the project. This close interaction has facilitated a fast and successful development process. The resulting product has recently even received an innovation award from an Indian industry association. The interactive innovation process is today regarded as a best practice in CA-I1 and has inspired several new development projects in close interaction with other suppliers in India. Moreover, CA-I1 has benefited greatly from reputational gains associated with the innovation award and its successful collaboration with A-PARENT, which is renowned for highest quality in India. However, due to the lack of expertise of AM-I at the time and the limited interaction with the central R&D team of A-PARENT during the project, the spillover of technical know-how to CA-I1 was only moderate.

The Chinese subsidiaries of A-PARENT in Suzhou (AC-C) and Changsha (AM-C) have also engaged in development activities together with domestic customers. The technological sophistication of these subsidiaries (in particular of AC-C) would have offered substantial learning potential for the customers. However, the activities remained largely concentrated on the application of products to the customers' vehicles and incremental adoptions to local requirements, while joint development of new products did not yet take place. The spillover of technologies to the customer was therefore impeded. But yet the interviews suggest that the customers have benefited from interactions with the MNE subsidiaries. An engineer of AC-C, for example, reported that the poor quality of technical specifications of a Chinese customer have induced the engineers of AC-C to offer trainings to the customer concerning the effective communication of specifications along the supply chain, which have improved the customer's communication with AC-C and – presumably – with other suppliers.

The subsidiaries of L-PARENT have been less active in collaborating with domestic customers. Most of the interaction with customers in the mass consumer market was restricted to large distributors. These distributors offered only limited potential for joint product

[45] CA-I1 is a major Indian automotive OEM. A phone interview (60 minutes) was conducted with a senior engineer of the Mumbai and Nashik plants of the OEM.

development activities. Consequently, the spillovers from the subsidiaries in China and India were limited to best practices in the supply chain and logistics domain. But the interviews suggest that also in this domain the overall learning impact on the domestic customer might have been moderate. Only in some large business-to-business projects (e.g. lighting solutions for the *World Expo* 2010 in Shanghai), domestic customers were able to benefit from substantial knowledge spillovers. In such projects, the engineers of L-C in Foshan cooperated very closely with domestic customers in developing customized solutions. However, such large projects have played only a minor role in L-C's overall business, and spillovers from these projects should therefore not be overemphasized.

6.5.1.3 Horizontal linkages to competitors

In the literature on MNE spillover, horizontal spillovers to domestic competitors are often reduced to *unintended* spillovers arising from the externalities of a subsidiary's activities in the host country (GIROUD and SCOTT-KENNEL 2006).[46] However, MNE subsidiaries might also proactively form linkages to domestic competitors and engage in knowledge exchange (e.g. joint innovation projects). This can be assumed to induce a spillover of the MNE's know-how and best practices to the partners.

Evidence for horizontal linkages to competing or related domestic firms in the case of the six researched subsidiaries was scarce. And if they (had) existed, these linkages were often related to the legacy of the subsidiaries in the host environment related to their entry mode. After the breakup of the joint venture of L-C and a domestic lighting manufacturer in the late 1990s, the subsidiary has maintained some minor business relations to the former partner (e.g. for the supply of components). But mainly due to the mistrust built up over the JV period, no (voluntary) exchange of knowledge between the two firms took place. On the contrary, L-C was focused on preventing leakage of strategic knowledge to the former partner (and new competitor). This early experience has hampered the ambitions of L-C to establish linkages to other competing or related firms in the host environment.

As one of the few exceptions, the automotive electronics unit at AC-C in Suzhou had tried to reach out to neighboring firms in the related consumer electronics industry for a joint benchmarking exercise. However, these firms showed little interest in such an exchange with the subsidiary. The project manager of AC-C suggested that the domestic firms in the region

[46] See *chapter 6.5.2* for a discussion of such unintended spillovers to unrelated firms and institutions.

might rely on informal channels to get the information they needed, and might therefore not be interested in a formalized exchange.

The other subsidiaries remained even more isolated from competing or related domestic firms. The impact of knowledge and technology spillovers in horizontal linkages in the case studies was therefore negligible.

6.5.1.4 Non-business linkages

MNE subsidiaries maintain manifold relations with non-business actors in the host environment (e.g. public administration, educational institutions, or civil society actors on the regional and national level). In these relations, they might exert considerable influence on their host environment (e.g. by encouraging business-friendly policy or by initiating improvements in the field of education) and might therefore reinforce the regional and national innovation system (PORTER and STERN 2001).

In the case studies, the most substantial non-business linkages were identified in the context of vocational training. These linkages were motivated by shortcomings in public education and vocational qualification infrastructure. While all researched subsidiaries have responded to these shortcomings with some kind of qualification efforts, the strategies – and therefore also the external impact – have differed significantly between the subsidiaries.

The Chinese subsidiaries of both MNEs have been more active in interacting with educational institutions and authorities than their Indian counterparts. Of the researched cases, AC-C stood out with its very systematic and collaborative vocational training efforts. In the initial years, this subsidiary has suffered from a mismatch of job profiles and available talent in the regional and national labor market. Consequently, it has initiated a vocational training program in 2007 together with two regional public training institutes (in Taicang and Wuxi) as well as city and provincial authorities, the German Chamber of Commerce, and other German firms in the Yangtze River Delta. The objective of the program was to introduce the concept of *dual education* (a mix practical and theoretical training) to China. Training contents were based on German curriculums, and on completion of the program each student was to receive a certificate from the German Chamber. As one of the largest associated firms and co-initiator of the program, AC-C delegated a full-time employee to the training institutes to coordinate the program. AC-C provided additional support in the form of training contents, trainers, and equipment. Moreover, it granted all students of the program access to its plant for practical training sessions (not only to the students associated with AC-C). The public

partners, in particular the training institutes, appreciated this initiative of AC-C, as it provided them access to state-of-the-art training methods, technical know-how, and professional program management. The program manager of the vocational training institute in Taicang, for example, reported that the training materials and best practices from AC-C as well as from A-PARENT in Germany have helped the institute to improve the quality of its vocational training programs for the MNEs, but also of its general public training programs. The training institutes have also benefited from additional public funding as a consequence of the attention the provincial authorities paid to the pilot project with the MNEs. An expert in the German Chamber of Commerce in Shanghai, who has interacted closely with AC-C in the context of the vocational training program, explained how AC-C had contributed to the program:

> *The teachers are employed at the institute and are therefore not directly involved with [AC-C]. But they benefit from its presence in the program indirectly because its high quality standards increase the aspirations levels of the entire institute.* (Head of Recruiting and Training, AHK Shanghai, trans.)

AM-C in Changsha has also established a vocational training program with a regional public education institute. But in contrast to the broad and inclusive initiative of AC-C, this cooperation consisted only of a bi-lateral agreement with the institute, and no other firms in the region were involved. In this agreement, AM-C can choose the most talented students after an initial year of education at the institute for an advanced training class. This class receives another two years of training tailored to AM-C's needs including English and German language training and training in the MNE's local and global production system. According to the HR head of AM-C, the partner institute in Changsha has benefited greatly from this cooperation. AM-C's internal training center provided training materials to the institute, introduced the institute's teachers to the MNE's warehouse management system, and gave suggestions for the training schedule of the advanced class, which could in turn also be rolled out to regular classes of the institute.

L-C in Foshan cooperates with two vocational training institutes in the region for more than ten years now. After an initial year of basic (theoretical) training at the institutes, the subsidiary invites up to 80 of the most talented students to its plant for another two years of practical training. On completion, successful students can obtain a contract with the plant. While the formal influence of L-C on the training content and the selection of teachers at the institutes remains limited, its frequent interaction with officials of the institutes and the city over the last decade has nevertheless enabled L-C to shape the program according to its requirements. The HR Director of L-C was convinced that the training institute has also benefited from this cooperation:

The school can use us as an advertisement to recruit students. […] And the school also improved their training program by learning from [L-PARENT]. (HR Director, L-C)

The subsidiaries of both MNEs in India were also engaged in vocational training efforts. However, these efforts were not as bold and inclusive as observed in the Chinese cases – and also not entirely voluntary. Indian law required both subsidiaries to offer practical training to a certain number of apprentices from regional public vocational training schools (ITI – Industrial Training Institutes). But beyond this obligation, bi- or even multilateral cooperation with external training institutes (and competing or related firms) did not take place. L-I in Sonepat has operated a highly successful in-house vocational training center for many years now. In this center, it educates the statutory share of apprentices and – if required – additional apprentices for its plant. The linkages of this center to external public training institutes, however, remained very limited. The training team of L-I had no confidence in the quality of the public institutes near its plant and preferred to recruit candidate from across Haryana state and the National Capital Region. As a result, its linkages to the institutes in the region remained weak. The institutes near the plant have in fact received some advisory services from L-I in an effort to *give back to the community* and to please regional authorities. But the training head of L-I suggested that the overall impact of L-I on these institutes has been marginal. Similarly, AM-I and AC-I in Bangalore have relied almost entirely on internal training capacity and did not put much effort in cooperating with external institutes.

Besides these linkages to vocational training institutes, the subsidiaries have also maintained linkages to universities and research institutes on the regional (and sometimes even national) level. In most cases these linkages were aimed at gaining access to human capital. But in some cases these linkages were also related to the subsidiaries' requirement for technical services. L-C, for example, has acquired technical services from universities and research institutes in the Pearl River Delta. These services consisted mainly of technical measurements for new materials or components. The two other subsidiaries in China (and to a lesser extent also the ones in India) reported about similar activities. However, these services involved mostly standardized procedures, and the relations between the two parties remained therefore often on an *arm's length* basis. The spillover of knowledge and technology from these linkages to regional universities and research institutes was therefore only moderate.

Only in one of the six case studies, embedded linkages to a university for the purpose of joint knowledge generation were identified. L-PARENT has maintained cooperation agreements with two of the country's leading technical universities in Shanghai. At one of these

universities, it has established a joint research center for new lighting technologies. This center has served mainly as a platform for the MNE scout technological developments in China. But nevertheless, R&D managers of L-PARENT were convinced that their engineers at the university had contributed to the foster capabilities and reputation of the research center as well as of the university in general. Moreover, the experience of L-PARENT with regard to the requirements of the world market has helped to channel the activities of the research center into the most promising fields of research. L-C in Foshan was only loosely connected to the activities of the center. While the two organizations engaged in regular interaction, the interviews at L-C suggest that the contribution of the research center in Shanghai to the evolution of the subsidiary has so far been marginal.

AC-C in Suzhou operates fairly sophisticated R&D activities. But as of today, it has not engaged in substantial joint development efforts with regional or national universities. While it maintained relations to several Shanghai universities, these relations were mostly intended to network in the regional business environment and to access human capital. R&D engineers in the subsidiary reported about ambitions to link to universities for the purpose of joint development efforts. But these plans have not yet materialized. In recent years, the safety product unit of AC-C has intensified its efforts with Fudan University in Shanghai. An expatriate manager has recently started to teach an engineering class and to advice the institute on its syllabus and research priorities. These efforts were motivated mainly by recruiting and brand building considerations, but also by a more long-term strategy to align the teaching contents at leading regional universities with AC-C's requirements. Although it could not be verified with the university itself, these efforts can be assumed to have contributed to the practical orientation of the industrial engineering institute of the university.

The other subsidiaries in China and India have established relations with universities in their respective regions for the purpose of recruiting and to a lesser extent for the acquisition of measurement services. In such relations, the potential for a spillover of knowledge and technology to partner institutions was very limited. And in fact, the interviewees in the subsidiaries did not observe that their activities have had a strong impact on these institutions.

6.5.2 Spillovers to unrelated firms and institutions

Besides the spillover of knowledge and technology in *linkages* to domestic partners, the case studies also provide evidence for (often unintended) *spillovers* to unrelated firms and institutions in the host environment. Such spillovers can occur as horizontal, intra-industry

spillovers (*localization economies*) as well as inter-industry spillovers (*Jacobs externalities*) (GIROUD and SCOTT-KENNEL 2006). Horizontal spillovers were at the core of many empirical studies – although with inconclusive evidence (BEUGELSDIJK et al. 2008). With the methodology and data at hand, this dissertation falls short to resolve this inconclusive evidence. What it can provide, however, is an in-depth account of spillover channels on the firm level as well as (tentative) indications for the associated impact on various actor groups in the host environment.

A straight-forward mechanism for spillovers from MNE subsidiaries is the mobility of labor between firms. According to MEYER (2004), "*MNEs build local human capital through training of local employees, yet these highly skilled individuals may move to locally owned firms […] thus enhancing productivity throughout the economy*" (MEYER 2004: 262). Depending on the specialization of the employees' expertise, the spillover of knowledge associated with the mobility of labor can occur both within and across industry sectors.

In China, the mobility of labor is generally at a significantly higher level than in the MNEs' home markets. A HR manager of AC-C in Suzhou, for example, observed:

> *We have a really strong fluctuation here. That is a Chinese habit. […] They want to switch the company after two to three years.* (Apprenticeship Manager, AC-C, trans.)

Along similar lines, the expatriate managers of L-C in Foshan observed that their employees demonstrated significantly less loyalty towards the subsidiary than what they had experienced in their home plants. Fluctuation in the two subsidiaries on the East Coast (AC-C and L-C) was particularly high among unqualified workers (up to 20 percent and more per year), while it was a bit more stable among qualified labor and engineers (some departments with less than five percent, others with up 15 percent per year). Only AM-C in Hunan Province enjoyed significantly lower attrition across all qualification levels.

The subsidiaries in India experienced comparatively low fluctuation, in particular among unqualified workers. The HR head of AM-I observed a very different working culture in his plant compared to the reports in China:

> *Attrition of blue collar workers was never an issue. […] After getting a job at a good company, normally they don't leave the company, they don't take a risk.* (General Manager HR, AM-I)

The situation of L-I in Delhi and Sonepat was similar to the one of AM-I. Only among its well trained apprentices, fluctuation was considered a problem.[47] This moderate fluctuation of

[47] In recent years, many apprentices have left L-I after having completed their training to accept offers from infrastructure projects in Delhi (e.g. Delhi subway). In some years, more than 50 percent of the apprentices left for these projects.

workers in the two Indian plants was mainly related to good salaries and working conditions and to a lack of alternatives nearby (at least in the case of L-I).

In contrast to the experience in China, fluctuation in India was highest among (highly-) qualified labor. The HR head of AM-I reported about difficulties in retaining qualified labor, in particular in R&D. Similarly, the head of L-I's R&D center in Delhi reported about increasing difficulties in recent years in retaining his engineers.

The interviewees in both MNEs were concerned that this mobility of workers and engineers might induce a spillover of knowledge to competitors and might thereby erode their competitive advantage. A quality manager of L-PARENT, for example, remarked:

> *We are aware of the strong fluctuation, and we are also aware that people who got well educated in our plants left to competitors. That worries me.* (Manager Quality P, L-PARENT, trans.)

An expatriate manufacturing manager of AC-C in Suzhou expressed similar concerns:

> *We were only sending a black-box to China. People were concerned that the know-how would disseminate to competitors within two days, because our fluctuation was very high. [...] When I started three years ago we lost 30 percent [per year]. Now our organization is more stable and Germany is more comfortable. But it remains a key point of concern, because China is the world champion in product piracy.* (Vice President MFG S, AC-C, trans.)

These concerns were mostly raised by managers in the MNE HQs and among expatriate managers in the subsidiaries. But also some of the Chinese managers shared this concern.

A more differentiated view on fluctuation and the mobility of labor suggests that the actual spillover of knowledge and technology from an MNE subsidiary differs considerably with the qualification level and destination of staff leaving the firm. The high fluctuation of (mostly unqualified) manufacturing workers in China was to a considerable degree owed to *reverse migration* of workers back to their home provinces. Spillovers associated with this type of labor mobility did therefore not strengthen (competitors in) the host region, but often distant regions in Central and Western China. However, the interviewees in both MNEs also noticed intra- or inter-industry mobility of labor – and therefore a dissemination of their knowledge – within the region. These knowledge spillovers included technical parameters and best practices in the manufacturing area. But the interviewees unanimously stated that these spillovers might not have generated substantial productivity gains in these firms, as most workers leaving the subsidiaries had only been trained in a fraction of the complex systems and processes that constitute the MNEs' competitive advantage.

The fluctuation of highly qualified process and development engineers as well as experienced sales managers has caused more concerns in the two MNEs. The interviews in the subsidiaries revealed several cases in which former employees of the subsidiaries have left to work in almost identical roles *on the other side of the street*. In some cases, these employees had switched to direct competitors of the subsidiaries. Such incidences could be indentified mainly in the case of AC-C in the Yangtze River Delta and L-C in the Pearl River Delta. The lack of data from domestic competitors prohibits an accurate assessment of the relevance of these spillovers for the performance of recipient firms. However, the interviewees suggest that by absorbing experienced staff from the subsidiaries, some of the domestic firms have managed to narrow the capability gap to the MNEs.

The case studies also provide evidence for a mobility of qualified labor *between* industry sectors in the region. In the case of AC-C in Suzhou, for example, the related consumer electronics industry has absorbed from some of the subsidiaries' engineers with expertise in electronics manufacturing (e.g. surface-mount technology). The interviewees in AC-C suggested that the most valuable contribution of these engineers to the firms absorbing them might have been their exposure to the sophisticated quality management systems of the MNE. Likewise in the case of L-I in Delhi, several experienced electrical engineers have left to consumer electronics firms in the region. As in the case of AC-C, the interviewees in L-I suggested that the major benefit from hiring these engineers might be their experience with the MNE's sophisticated processes and systems rather than with product technologies.

The mobility of labor between MNE subsidiaries and domestic firms in the region might of course also work to the detriment of domestic firms. The absorption of the region's top talent by MNE subsidiaries is often cited as a potential disadvantage of FDI for domestic firms (MEYER 2004). However, the interviewees in all subsidiaries claimed that they had lost more experienced talent to firms in the region than they could attract from them.[48] The outflow of talent from the subsidiaries was induced by the rising popularity of the leading Chinese and Indian companies in the domestic labor market. According to HR managers in the subsidiaries, the outflow of talent was also induced by the fact that the industry sectors of the two MNEs were often not the first choice for qualified graduates. In particular the subsidiaries of L-PARENT have experienced difficulties in retaining top talent, because the lighting industry is not very popular among engineers in China as well as in India. The automotive

[48] While the HR data acquired in some of the subsidiaries during the data collection process is largely confirmatory, the lack of comprehensive and comparable data from all subsidiaries prohibits a verification of these statements.

industry was generally more attractive among graduates. But *tier-one* suppliers like A-PARENT were often regarded as the second-best option, as most graduates preferred to work for the automotive OEMs. These findings suggest that the presence of the MNEs subsidiaries did not have major adverse effects on the regional (or national) labor markets in the two host countries.

Another mechanism with potential impact on the host environment is the *spin-off* of new firms from MNE subsidiaries (MEYER 2004). Studies on spin-offs in emerging economies found that successful domestic entrepreneurs in high-tech fields often had prior experience in MNE subsidiaries. In India's IT (-services) industry in Bangalore, for example, many of the dynamic domestic firms were founded by alumni of IBM or Hewlett Packard (DOSSANI and KENNEY 2007). However, the case studies do not provide evidence for such spin-off activity. While in some cases engineers of the subsidiaries have joined domestic start-ups, no prominent event of entrepreneurship of subsidiary staff could be identified in the case studies.

Even without employees actually leaving the subsidiaries, a spillover of knowledge and technology into the region can occur through demonstration effects. The interviews in the subsidiaries and with selected domestic suppliers suggest that domestic firms could easily acquire information about the subsidiaries' process specifications and product characteristics from one of their suppliers or customers. Besides having an *ear on the street*, some firms have also acquired information in a more proactive manner. In particular AC-C and L-C in China observed both subtle and bold cases of knowledge dissemination in their plants. A technical manager of AC-C reported:

> *If you ask a Chinese firm to make a benchmark, they will decline. […]They already know a lot about you. It's just that they use different channels. That's the culture. They have networks, they know guys working here.* (Senior Project Manager E, AC-C)

Similarly, a manager of L-C in Foshan reported about the leakage of information to competitors. In one case, the subsidiary ordered new machines for the manufacturing of a new product. With minimal time lag, the former JV partner of L-C in the same city ordered the same machines (with identical technical specifications) from the very same supplier – but with ten times the capacity of L-C.

The interviews suggest that the spillover of such production- and process-related knowledge has predominantly benefited firms in the same industry. In particular the subsidiaries located in clusters of their respective industries (e.g. AC-C in the Yangtze River Delta and L-C in the

Pearl River Delta) have experienced a continuous dissemination of their knowledge into the cluster. In the case of L-I in Sonepat and Delhi and AM-I in Bangalore, the industry-specific knowledge of the subsidiaries was not in such high demand. The fact that centers for the respective industries lay elsewhere in the country has functioned as a natural barrier to knowledge spillovers.

An interesting question in this context is whether the efforts of the subsidiaries to proactively develop their suppliers have generated *multiplier effects* in the sense that other domestic firms monitor and assimilate the MNEs' knowledge from these suppliers. Anecdotal evidence from the interviews suggests that some of the MNEs' suppliers have in fact induced technological upgrading among their peers in the host environment. An accurate assessment of the magnitude of this effect, however, would require a more comprehensive data set.

The joint initiatives of the MNEs and public educational institutes in the field of vocational training are another potential mechanism for spillovers to unrelated firms and institutions. Besides providing well-trained graduates for the subsidiaries' own plants, the establishment of vocational training programs was also found to have increased the pool of well-trained graduates for domestic firms. The training institute of L-I in Sonepat, for example, trained twice as many apprentices than it required for its own plant as a contribution to the region.[49] Similarly, the vocational training center of AM-I's sister plant in Bangalore has gained nation-wide recognition for the large number of apprentices it trained every year beyond its own requirements. In both cases, this spillover of qualified apprentices into the region was motivated by *corporate social responsibility*, but also by the intention to foster good relations with regional authorities. Domestic firms were eager to hire the apprentices of the subsidiaries, since the vocational training centers of the subsidiaries enjoy a very good reputation in India.

Apart from these (moderate) direct benefits for the host environment, a particularly interesting question in the context of regional economic development is whether the vocational training initiatives of the MNE subsidiaries (in particular the ones in China) have had a broader effect on the behavior of domestic firms and authorities. Such an effect could include the proliferation of the MNEs' best practices (e.g. the dual education scheme or more generally the focus on practical exercise in education) among firms in the region. The interviews suggest that such a proliferation among domestic firms has not (yet) occurred in the respective

[49] In the early phase, the training center of L-I was co-funded by the German Technical Cooperation (GTZ) under the condition that the center will train 200 percent of its actual requirement as a contribution to regional economic development.

locations. The domestic firms were found to show little interest to participate in (or replicate) a vocational training scheme which they perceived as very expensive and time-consuming. And despite considerable attention paid to vocational training by public authorities, the city and provincial authorities in the respective locations did not demonstrate ambitions to induce a *mainstreaming* of the MNEs' training concepts in the region. The overall impact of the subsidiaries' initiatives in vocational training on their host environment should therefore not be overstated. However, in the light of increasing labor shortage on the one hand and the ambition of policy makers to upgrade the (technological) capabilities and value-add in domestic firms on the other hand, the pilot projects of the MNEs might inspire initiatives of policy makers and/or domestic firms in the near future.

Finally, another potential impact of (market-seeking) MNE subsidiaries on unrelated firms in the region is related to competition. The presence of technologically-advanced MNEs might generate pressure on domestic competitors to improve their value proposition. This might in turn strengthen the regional (and national) innovation system. However, depending on the competitive position of domestic firms, it might also lead to a *crowding out* of domestic firms (MEYER and SINANI 2009).

The subsidiaries of A-PARENT serve mainly the premium (and the upper end of the middle) segment of the host market (e.g. the global automotive OEMs).[50] The subsidiaries of L-PARENT were also most successful in the premium segment (e.g. large customized lighting projects). However, both L-C and L-I have also penetrated the mass market in the recent decade – with varying degrees of success.

In the premium segment, both MNEs competed successfully with their strong reputation as well as their technology and quality advantage. This segment was mainly contested by MNEs as well as few strong domestic players. AC-C in China and AC-I in India faced competition mostly from other multinational automotive suppliers, while AM-C and L-C in China and L-I in India faced competition from a mix of multinational and domestic firms. The premium segment has seen very dynamic growth in the recent decades. In this favorable environment, a substantial *crowding out* of domestic firms has not (yet) occurred. On the contrary, more and more domestic firms have upgraded from the middle segment of the market into the premium segment. The presence of the technologically-advanced MNEs has induced these domestic firms to upgrade their capabilities and operations in order to compete in this segment. And in fact, the interviewed subsidiary managers have observed very dynamic upgrading of some of

[50] The only exception is AM-I in India, which has a long history as a supplier to Indian Automotive OEMs.

their domestic challengers, which raised concerns among subsidiary and HQ managers regarding the transformation of these firms into *global challengers* on the world market.

The researched subsidiaries (except AM-I) have gradually moved from the premium segment to the much larger middle segment of the market, where they faced direct competition with domestic firms. Due to their expensive overhead, high standards, and high input cost, the subsidiaries were often in an uncompetitive cost position. Domestic competitors were able to exploit their superior market knowledge and networks as well as their favorable cost position. However, the initiatives of the subsidiaries to localize their products and improve their cost position as well as the sophistication of customer requirements and government regulation have put increasing pressure on domestic firms to move beyond mere cost competition. The interviews with subsidiary managers of both MNEs revealed that their domestic competitors were increasingly taking measures (e.g. related to product functionality and quality) to improve their value proposition to domestic customers vis-à-vis the MNE challengers.

Although the middle segment of the market in China and India was highly contested, the subsidiaries have managed to increase their market share in recent years. While AM-C and AC-C in China have achieved particularly strong gains in recent years, L-I and AM-I have struggled most with gaining leeway in the Indian market. But even in the case of the most two dynamic subsidiaries (AC-C and AM-C in China), a broad *crowding out* of domestic firms could not be observed. The dynamic growth of the market offered sufficient potential for (most) domestic firms and MNE subsidiaries to co-exist, although the market in both industries has consolidated to some extend since the recent financial and economic crisis.

The lower end of the host market was not contested by the subsidiaries. This was related to their cost position, but also to concerns about quality and safety standards in this market segment, which were often not compatible with the MNEs' global standards. The competition effect on this market segment was therefore negligible.

6.6 Mediating conditions for spillover generation and absorption

The discussion on intended and unintended spillovers in the case studies has revealed a range of spillover mechanisms and has presented evidence for an impact of these spillovers on linkage partners as well as on the host environment in general. The case studies demonstrate that such spillovers do not occur automatically and are not distributed equally among external partners and regions. This raises questions about which conditions on the level of the *knowledge-originating* (MNE and subsidiary) and *knowledge-receiving* organization

(domestic firms and institutions) induce or impede such spillovers to occur. In the following, these mediating conditions will be look at in some detail.

6.6.1 Conditions on the level of the knowledge-originating MNE

Mediating conditions for the generation of spillover potential by MNE subsidiaries locate on the level of the subsidiary and the MNE as well as more indirectly on the level of domestic policy and institutions.

Subsidiary-level conditions

The product and value-add scope of a subsidiary's operations was found to constitute an important condition for spillovers to occur in *linkages* with domestic partners as well as through unintended *spillovers* to the host environment. The case studies suggest that the potential for spillovers to domestic partners has often co-evolved with the subsidiaries' own operations. In the case of, L-C, for example, the upgrading of the subsidiary from an *Adopter* to an *Adopter* type of *Replica* with an Asia-Pacific mandate in some areas and from a *Rationalized Manufacturer* to a *Product Specialist* in some other areas has been accompanied by an upgrading of regional suppliers as well as of educational institutions. Initially, the requirements of L-C with regard to qualified workers involved mostly basic mechanical skills. But with the gradual sophistication of L-C's manufacturing lines, the requirement for additional qualifications (e.g. *mechatronics*) has emerged. Some of these more specialized trades constituted a novelty in the region. Consequently, L-C initiated a new class for this qualification at one of its affiliated vocational training institute in Foshan and provided the institute with training materials from Germany. The sophistication of manufacturing lines was also associated with higher quality requirements for input materials and components. L-C's purchasing team has therefore conducted as range of trainings for its suppliers in order to enable them to meet these reinforced requirements.

In the other two dynamic subsidiaries in China (AC-C and AM-C), a similar co-evolution of the subsidiaries' operations and spillover (potential) was observed. In contrast, the stagnation of L-I and AM-I in India (in terms of their product, value-add, and geographic scope) has deprived their suppliers from such a co-evolution with their MNE partners.[51]

[51] Whether these suppliers had sufficient absorptive capacity to make efficient use of the spillover potential is a separate issue, which shall be discussed in the section on recipient firms below (*chapter 6.6.2*).

Prior studies found that the propensity of subsidiaries to generate positive spillovers increases if subsidiaries perform strategic activities (GIROUD 2007: 172). In particular R&D operations are associated with learning potential for domestic firms. DANTAS et al. (2007), for example, find that spillovers of MNE subsidiaries to domestic firms are "*[…] strongly associated with the existence of knowledge-creating activities undertaken by local subsidiaries themselves*" (DANTAS et al. 2007: 26). Some of the subsidiaries, in particular AC-C and L-C in China, have increasingly engaged in such knowledge-creating activities in recent years. The fluctuation of some of their engineers has certainly fostered human capital in the region. But as discussed above, the two subsidiaries did not engage in joint innovation efforts with domestic partners, which might contribute most effectively to foster innovative capabilities in the host environment (MARIN and BELL 2006). Most R&D activities of these subsidiaries were done in-house in interaction with the MNE, which has impeded a spillover of knowledge and technology from these activities into the region. The most effective spillovers from R&D operations of the subsidiaries were observed where the subsidiaries did actually engage in knowledge-creating activities with domestic partners. A good example is the joint development of an electronic control unit by AM-I and its domestic customer. However, such linkages were very scarce in the case studies.

These findings raise questions concerning the willingness and ability of MNE subsidiaries to form *linkages* with domestic partners. In most cases, initiatives of the subsidiaries to form external linkages were found to have been related to the (perceived) requirement for external input. Regarding the R&D activities described above, for example, the major barrier for linking to external partners was the limited R&D mandate of the subsidiaries (mostly incremental application tasks) and, related to that, the limited requirement for external input. A R&D manager of AC-C explained:

> *We do not develop a new generation of products. For that you would need cooperation with universities and other local institutions. [...] But for our focus on application our most important external contact is our customer. Universities might be interesting for recruiting, but not for knowledge transfer.* (Senior Director Engineering S, AC-C)

Also in the subsidiaries of L-PARENT, the assigned R&D responsibilities as well as the continuous tight integration of the subsidiary in the MNE-internal network did not encourage a proactive linking to external partners.

Similarly, the subsidiaries' requirement for (qualified) labor has influenced their willingness to link to external partners in the field of vocational training. The different levels of initiative demonstrated by subsidiaries in China and India reflect the different growth rates of these

units. While the subsidiaries in China were growing dynamically, the two Indian subsidiaries AM-I and L-I underwent moderate growth or even stagnated. A steady supply of qualified labor has therefore not been very high on the agenda of the Indian units, which has impeded efforts to cooperate with external training institutes or other firms in the region.

The interviews also revealed that the risk aversion of subsidiary managers plays an important role for the generation of spillover potential. The six subsidiaries shared similar concerns with regard to spillovers to competitors. But the willingness to accept the risk of losing knowledge in the host country differed between the subsidiaries of the two MNEs. The subsidiaries of L-PARENT were especially concerned about this aspect. The technical head of L-C reported:

> *Our competitors send engineers to a supplier to work with him until the requirements are met. [...] By doing so you run the risk that this supplier will deliver the improved material also to your competitors. We see this as a risk. [...] We do not want to strengthen the competitors.* (Vice President Technical, L-C, trans.)

Interviewees in L-I in India expressed similar concerns about the upgrading of suppliers. Among other examples, a R&D manager reported about a situation in which supply relations to a large supplier were terminated due to concerns about the dissemination of knowledge:

> *It was a management decision to switch suppliers. The first sample submitted was not good. We told them what the problem was. They corrected it and submitted again the sample. We have seen four or five iterations. But when the product met our standards […] they also started business with other companies. [L-PARENT] did not like that, because we put a lot of effort in qualifying the product.* (Principal Engineer, L-I)

Owed to these concerns, the two subsidiaries of L-PARENT were hesitant to share knowledge with external partners. This has reduced the potential for spillovers to firms and institutions in the host environment. In contrast, the subsidiaries of A-PARENT have been more open to proactively develop suppliers and other domestic partners. The spillover of some of the MNE's knowledge to domestic competitors was accepted as the price to compete in dynamic emerging economies such as China and India.[52]

A subsidiary's willingness or ability to link to domestic partners is of course also related to the capabilities (and resources) of its staff. In particular the proactive development of external suppliers requires a subsidiary to reach beyond a certain capability threshold. The absence of supplier development by L-PARENT's subsidiaries was at least in parts related to the insufficient capabilities and resources of their purchasing departments. The head of the purchasing department of L-C in Foshan, for example, acknowledged a mismatch of the need for more proactive supplier development on the one hand and the resources and capabilities

[52] These differences in the attitude of subsidiary managers reflect different industry and corporate cultures. These aspects will be discussed separately below in the section on mediating conditions on the level of the MNE.

available in his department on the other hand. In order to implement improvements in the supplier's plants, the purchasing department had to request resources from the quality or production department. More than once, such requests were denied by these departments. In contrast to this finding at L-C, AC-C in Suzhou mobilized significant resources and expertise for the active development of domestic suppliers. Supplier development was given high priority by senior management of the subsidiary. Consequently, the purchasing department – already equipped with considerable expertise – could access experienced engineers also in other departments. This suggests that AC-C has generated more potential for spillovers to suppliers than what was observed in the case of L-C.

Prior studies have also established a link between the entry mode of a MNE subsidiary (e.g. *greenfield* versus *brownfield* investment) and its propensity to form linkages to domestic partners (UNCTAD 2001, MEYER 2004). In the case studies, the entry mode of the MNEs did not appear to have been played a pivotal role for linkage formation. However, the influence of the entry mode differed significantly over the lifetime of a subsidiary. In the initial phase, the entry mode has in fact influenced the embeddedness of the subsidiaries in the host environment. The subsidiaries with a long history under domestic leadership (e.g. L-C in Foshan and AM-C in Changsha) have benefited from established networks to domestic suppliers, customers, and authorities. However, in most cases such *inherited* suppliers (and often also customers) were soon replaced by other suppliers once the MNE took over. Also the advantage in relations to authorities was soon evened out. After some years of operation, it was in fact very difficult to identify differences in the external relations of the subsidiaries which could be traced back to their entry mode. The *greenfield* subsidiary AC-C and the acquired subsidiary AM-C, for example, have followed very similar strategies with regard to domestic partners.

The propensity of a subsidiary to form linkages to domestic partners and to induce spillover to the host environment might also be related to its age (GIROUD 2007). The case studies suggest that age influences the potential for spillovers mainly in the sense that it allows for favorable conditions to develop (e.g. sophisticated operations and endogenous capabilities of a subsidiary). Age might therefore function as a precondition for other mediating conditions (e.g. subsidiary capabilities) rather than as mediating condition in its own right. However, evidence in the six case studies suggests that a subsidiary's age and its embeddedness in external linkages do not necessarily coincide, and that a range of other subsidiary-endogenous and external conditions mediate the link between these two factors.

Another important mediating condition on the level of the subsidiary is the ambition (and success) of subsidiary management to protect their knowledge against unintended spillovers. The subsidiaries were particularly concerned about unintended spillovers related to the mobility of labor. Considerable efforts were therefore dedicated to the retention of talent (in particular process and development engineers). Recognizing that fluctuation could never be stopped entirely, the subsidiaries have also systematically distributed responsibilities and knowledge among their workforces. An expatriate manager of AC-C reported:

> *The key measure is not to give all know-how to a single team member. We split the responsibilities in projects among our people, so in case we have a leak no one can access the entire knowledge.* (Vice President MFG S, AC-C, trans.)

This strategy of splitting responsibilities was observed in all researched subsidiaries.

The subsidiaries were also found to avoid purchasing critical equipment and machinery in the host environment. This was related to concerns about losing their competitive advantage embedded in their equipment and machinery when working with domestic suppliers. The General Manager of AM-C reported:

> *We have core capabilities in the plant. Technologies you cannot just buy on the market. We protect these technologies by building our machinery and equipment in-house.* (General Manager, AM-C, trans.)

When the transfer of critical technologies to domestic partners could not be avoided, the subsidiaries have often attempted to establish safeguard measures at the level of the partner. A rigorous strategy in this context is to forbid suppliers to work for other customers (or at least for competitors) on particular technologies. An expatriate engineer L-I provided an example:

> *We develop exclusive circuits for electronic ballast. A technology developed in-house. For that we only work with suppliers who work exclusively for [L-PARENT]. We have a different approach for each technology.* (Project Manager Technical, L-I, trans.)

However, such exclusive supplier relations were only observed in few cases involving very sensitive technology. In most cases, the subsidiaries were eager to avoid an over-dependency of their suppliers on the subsidiary. This was due to the fact that overly-dependent suppliers are less stable in case of a crisis in demand when compared to suppliers with a diversified customer base. Moreover, the lack of exchange with other domestic firms might eventually isolate such dependent suppliers from innovations in the host environment.

Instead of requiring exclusivity from their suppliers, the subsidiaries have therefore often settled for physically separate manufacturing lines in the suppliers' plants for the manufacturing of their products. The interviewees were aware that this could not prevent a

gradual spillover of their knowledge (e.g. specific process parameters) to competitors working with the same supplier. But they hoped that it would at least delay the spillovers.

These and other safeguard measures identified in the case studies have reduced the potential for spillovers to firms and institutions in the host environment. Although the effectiveness of these measures could not be measured accurately with the available data, the interviews suggest that they have so far helped to prevent leakage of critical knowledge and technology.

MNE-level conditions

Mediating conditions on the MNE- or HQ-level have not received sufficient attention in the literature (MEYER 2004, GIROUD and SCOTT-KENNEL 2006). This is particularly true for Economic Geography literature, which often fails to link the analysis of regional economic activity with mechanisms within the knowledge-originating MNE (BEUGELSDIJK et al. 2010). The case studies demonstrate that such MNE-level conditions can exert considerable influence on the generation of spillover potential.

First and foremost, the case studies demonstrate that the investment motive of the MNE plays an important role for the generation of spillover potential. An advantage of market-seeking FDI in this context is that (low-cost) competition in the domestic market might induce MNEs to form linkages with domestic firms to even out their cost disadvantage. Export-oriented subsidiaries, on the other hand, might operate in enclaves with fewer linkages and, therefore, fewer spillovers (JAVORCIK 2004, BEUGELSDIJK et al. 2008).

The case of L-C in Foshan illustrates this mechanism. The subsidiary was initially focused on exports to the global market rather than on the Chinese market. In the competition with sister plants worldwide, L-C's cost position was superior. It therefore felt little pressure to optimize the costs of its operations – for example by localizing supply. And when L-C did attempt to localize some components, the high requirements of global customers have often impeded it. Only since L-C got more involved in the domestic market and faced competition of Chinese firms, it developed the ambition to form supply linkages with domestic firms and to outsource certain value-add steps it order to optimize its cost position.

Market-seeking subsidiaries are also likely to have lower entry barriers for domestic suppliers. The interviewed domestic suppliers reported that it was relatively easy to serve the subsidiaries' production for the domestic market. But once the suppliers attempted to also serve the subsidiaries' production for the world market, they struggled to meet the higher quality requirements.

However, the merits of export-seeking subsidiaries for domestic firms should not be dismissed. Once domestic suppliers qualify for the export business of MNE subsidiaries, the overall learning potential might increase drastically due to higher quality standards in the export business and increased efforts of the subsidiaries to strengthen their suppliers.

In the case studies, only L-C was exporting to the world market. The interviews in the subsidiary and with suppliers do not confirm that the suppliers have benefited substantially from a greater learning potential embedded in the export activity of L-C. While the sophisticated specifications of the export business have motivated upgrading initiatives on the level of the supplier, the restrictive policy of L-PARENT with regard to supplier development has impeded substantial spillovers of knowledge and technology.

Export-oriented FDI and, related to that, the absence of direct competition with domestic firms might also soften concerns of the HQ about unintended spillovers to domestic firms (BLYDE et al. 2004). Export-seeking subsidiaries might therefore invest less time and resources in rigorous safeguard measures than market-seeking subsidiaries, which might in turn facilitate the spillover of knowledge and technology to domestic firms. However, the case studies do not confirm this assumption. In the early phase, L-C was entirely focused on exports. But the subsidiary did nevertheless invest in protective measures to minimize leakage to the host environment. This was owed to concerns that, sooner or later, L-C might have to compete against the Chinese firms either in the domestic market or on the global market.

Since recently, both MNEs have also pursed strategic-asset-seeking motives in China (and to a lesser degree in India). A-PARENT was highly interested in knowledge and technology in the field of eMobility and low-cost vehicles, while L-PARENT was interested in solid-state lighting expertise embedded in China's lighting industry. The availability of such strategic assets has motivated the two MNEs to encourage the formation of linkages to technology clusters in these markets. Up until now, however, the main focus of these linkages has been on technology and market *scouting* rather than on pooling the MNEs' technology with the expertise of domestic firms. In such a *scouting* setup, the potential for spillovers is limited. But once the MNE decides to invest in a full-fledged R&D center to participate in the dynamics of a regional innovation system, the spillover between the MNE and firms in the host environment is likely to intensify. Such a scenario is currently emerging in the case of a new R&D center of L-PARENT in Shenzhen nearby the existing L-C plant. With this R&D center, L-PARENT attempts to pool its knowledge with domestic firms. In the mid- to long-run, this investment might reinforce the innovation system in Shenzhen.

These findings suggest that neither market- nor export-seeking investment motives are generally superior in terms of spillover potential for domestic firms. The value of such MNE operations in the host environment depends on the configurations of individual recipient firms and the region in general.[53] Less sophisticated suppliers might find it easier to link to (and benefit from) market-seeking subsidiaries, while in the case of more sophisticated suppliers export-seeking MNEs might offer more spillover potential. In the case of strategic-asset-seeking FDI, substantial spillovers of knowledge might depend on the ability of the environment to induce the MNE to form linkages to domestic firms.

The MNE's global sourcing strategy was also found to play an important role for the generation of spillover potential. Linkages to MNE subsidiaries can provide strong domestic suppliers access to the global supply chain of the MNE. The case studies demonstrate that once domestic suppliers secure export mandates, both the indirect (e.g. demonstration effects and high requirements) and direct spillover mechanisms (e.g. supplier development programs) associated with backward linkages are likely to be reinforced.

The case of L-C in Foshan demonstrates this vividly. The purchasing team for the plant in Foshan lacked both the resources and capabilities to engage in substantial supplier development. The team consisted mostly of commercial purchasers, while the development of suppliers would have been required experienced engineers. For the purchasing of materials and components for the plants of A-PARENT in Germany, a separate global purchasing team was established in L-C. This team consisted of highly qualified engineers with manufacturing and quality experience and was therefore better equipped to upgrade the domestic suppliers serving the international plants of the MNE.

Similarly, the suppliers of AM-I in Bangalore have benefited from increased attention and support from the MNE once they had secured export mandates. A Bangalore-based supplier of AM-I (SA-I-1) reported that after having won a contract to serve A-PARENT in Germany, some of its engineers were invited to Germany to learn about processes and requirements of the MNE. This experience has helped the engineers of SA-I-1 to better understand the requirements of A-PARENT and other OEM customers in the developed countries and to adjust their internal processes and quality management accordingly.

More indirectly, suppliers exporting to international plants might face new and often challenging technical requirements. The manufacturing head of SL-I2, a supplier of L-I, reported:

[53] The mediating conditions on the level of recipient firms will be discussed in a separate section below (*chapter 6.6.2*).

> *The technical specifications in the US or Europe are different, because their machines run with much higher speed. So we had to do a lot of changes to our processes.* (Head Manufacturing, SL-I2)

Similarly, the General Manager of SA-I1, a supplier of AM-I in Bangalore, reported that his firm was required by the MNE to upgrade the molding processes in its plant, as its existing processes failed to meet the requirement of A-PARENT. Other domestic suppliers with export mandates confirmed that the requirements in terms of quality and delivery had increased significantly when they had started to serve international plants of the MNEs. These examples demonstrate that the spillover potential in backward linkages might increase once domestic suppliers qualify for supplying international plants of the MNE.

The attitude of HQ managers to encourage or tolerate linkage formation and knowledge sharing in the host country also depends on the characteristics of the industry. Firms in the automotive and lighting industry face different requirements to coordinate their operations along the value chain and to cooperate with external partners. Automotive suppliers typically have a limited number of large customers which impose rigorous quality and process requirements to its suppliers and further down the value chain (see e.g. SROUFE and CURKOVIC 2008, STURGEON and BIESEBROECK 2010). The tight integration of the automotive value chain is related to strict quality requirements, supply chain efficiencies, and the dominance of *synthetic*, engineering-based knowledge generation in the innovation process. These characteristics induce favor frequent interaction and geographic proximity of firms in the automotive supply chain (ASHEIM et al. 2007).

Firms in the lighting industry face less rigorous quality requirements. And the same time, they face a wider range of expectations from different customers (e.g. mass-market commodity versus large, customized projects) (SANDERSON et al. 2008). In the commodity lighting business, proximity to suppliers and customers is less critical than in the automotive industry. The interaction with customers is often limited to the coordination of logistics, and the national and international markets are served from few central logistics hubs. From a manufacturing perspective, proximity to suppliers is less critical than in automotive, because the lighting industry does not operate with comparable *just-in-time* delivery schemes. Innovation in lighting depends to a considerable degree on *analytical* knowledge generation. This implies that R&D operations in the lighting industry might be less space-sensitive and might benefit more from (cognitive) proximity to research communities on both the local and global level (ASHEIM et al. 2007). However, the R&D activities of the researched lighting subsidiaries were mostly dominated by *synthetic* knowledge generation (e.g. adapting

products to domestic requirements). For these activities, geographic proximity to customers and suppliers plays a more important role.

Everything else equal, these considerations suggest that subsidiaries in the automotive industry might induce a tighter integration of processes and systems along the value chain and might show more ambition to develop domestic suppliers. The case of L-C in Foshan confirms this assumption: When L-C attempted to expand from the consumer lighting into the automotive lighting segment, the automotive OEMs required L-C to train its employees, upgrade its manufacturing processes, and establish development programs for its suppliers.[54] These requirements went far beyond the ones in the consumer lighting industry. These considerations help to explain why the subsidiaries of A-PARENT have been more active in working with suppliers and customers than the ones of L-PARENT. However, it would be wrong to view the subsidiaries of L-PARENT as footloose enclaves. In particular with regard to engineering-based process improvements, frequent (face-to-face) interaction with suppliers – and therefore geographic proximity – has played an important role in these cases.

Furthermore, industry characteristics were found to affect the third-party business of domestic suppliers. Cyclical demand in the automotive industry, and in particular the experience of the global demand crisis after 2007, has encouraged A-PARENT to ensure that the suppliers of its subsidiaries do not rely with more than 30 to 50 percent of their total revenue on the MNE in order to guarantee their stability in future crises. This policy supports (regional) economic development by avoiding instability of regional suppliers related to volatile demand of individual MNEs as well as by inducing the distribution of the MNE's knowledge among firms in the host environment. In contrast, the subsidiaries of L-PARENT have paid less attention to their share of a supplier's business. L-C in Foshan, for example, has tolerated that one of its local suppliers was entirely dependent on the business with the subsidiary. In the light of the relatively stable demand in lighting, such a strategy appeared less risky than in the more volatile automotive industry. However, also in L-C the stability of key suppliers has come more into focus recently.

Besides such industry-specific characteristics, the individual risk culture of the two MNEs was found to shape the attitude of HQ managers towards linkage formation and knowledge exchange. Overall, L-PARENT has demonstrated more risk aversion in its Chinese and Indian operations than A-PARENT. The interviews with subsidiary and HQ managers in L-PARENT

[54] Automotive OMEs typically require their suppliers to obtain ISO/TS 16949 certification. This certification requires systematic quality management on the level of *tier-one* suppliers and further down the value chain.

suggest that in particular with regard to proactive supplier development, this MNE has been very reluctant. This was mainly due to concerns about the loss of intellectual property to multinational or domestic competitors. Interviews with suppliers confirmed that L-PARENT has been very restrictive with regard to knowledge sharing when compared to other firms in the industry. Only since recently, the competitive pressure in China (and India) as well as changes in top management of L-PARENT have induced an opening up to external partners.

A-PARENT has been faster to adopt a more pragmatic attitude towards linkages and knowledge transfer in the emerging economies. In the course of the dynamic growth of the Chinese and Indian markets, this MNE has learned to accept the leakage of some of its knowledge as the price it has to pay to compete in these markets. Recognizing that commercial success in China and India will require substantial embeddedness in the host environment, A-PARENT has made efforts to support its subsidiaries (in particular in China) in strengthening their domestic suppliers. Overall, the case studies suggest that the willingness of A-PARENT to take risks – and therefore also the potential for spillovers to the host environment – has been higher than in L-PARENT.

Impact of domestic policy and institutions on originating firms

The case studies demonstrate that favorable policies and institutional frameworks in the host environment of a subsidiary can induce an upgrading of the subsidiary's operations and therefore also the potential for spillovers to occur. Various drivers of subsidiary evolution in the host environment have already been discussed in *chapter four* and shall not be repeated here in detail. The following discussion will therefore only highlight some key aspects with regard to how national and regional policy can induce spillovers from MNE subsidiaries.

The generation of spillovers starts with the MNE's choice of *when*, *where*, and *how* to engage in foreign direct investment. National and regional policy influences these fundamental decisions. Both MNEs had entered China and India with sales representations or licenses agreements already several decades. But the value-add and therefore also the potential for (technological) spillovers from these operations was still very limited. Substantial foreign direct investment in manufacturing by the two MNEs took place only since the 1990s and early 2000s after the two countries had began to liberalize their investment regime, strengthen their institutional framework, and – as a consequence of these policies – demonstrate strong economic growth. China has led the way and started to liberalize its economy for private enterprise and foreign investment already in the late 1970s. In the course of the 1980s and 1990s, economic liberalization accelerated and various measures were introduced to attract

foreign investment. Since the WTO accession in 2001 the regulatory framework for foreign-owned companies was further improved (WEI et al. 2008, WTO 2010). India started to liberalize its economy about a decade later in the early 1990s. In particular since the turn of the century it has adopted a series of reforms and tariff reductions (KOHLI 2006, ANSARI and RANGA 2010). These policies have created the basic requirements for the establishment of the six researched subsidiaries in China and India since the late 1990s.

National and regional policy has also influenced the MNEs' location choice in the two host countries. AC-C was attracted to Suzhou by the newly created Suzhou Industrial Park (SIP) with its good facilities, supportive administration, and liberal regulations regarding ownership. Already in 1999, A-PARENT was allowed to establish a wholly-owned company in the SIP – a critical requirement for the knowledge-intensive manufacturing of electronic control units. Facilities catering to expatriate staff (e.g. international schools) have further supported the location choice. The establishment of AM-C in Changsha was the result of an acquisition of facilities from a former licensee partner. Due to insufficient regional infrastructure at the time, the relocation of operations from Germany and the plant in Suzhou to Changsha has provoked heated discussions in the MNE. Bold investment in infrastructure and incentives to focus industries (including automotive) by the central and provincial government have contributed to eventually convince A-PARENT to invest in Changsha. The location choice of the other subsidiaries was mainly owed to existing plants of external partners (L-C and L-I) or sister subsidiaries (AM-I and AC-I).

The mode of entry of the two MNEs was also influenced by policy and regulations at the time. In the case of L-PARENT, regulations and pressure from national and provincial authorities have pushed the MNE into joint ventures (JV) with domestic partners in both Foshan (1995) and Delhi-Sonepat (1994). However, entering new markets in JVs with domestic partners was also in line with the MNE's approach in other locations. In the case of A-PARENT, different entry modes were chosen. AM-I (1989) in Bangalore was established as a public enterprise with a majority-stake for national holding of A-PARENT in India, since wholly-owned foreign ventures were not allowed at the time. In contrast, AC-I (2009) in Bangalore could be established as a wholly-owned *greenfield* venture. In China, AC-C (1999) in Suzhou could also be established as wholly-owned *greenfield* venture – a rare exception at the time made which was made possible by liberal regulations in the Suzhou Industrial Park. AM-C (2004) in Changsha was established as a wholly-owned *brownfield* venture through the acquisition of the site of a former licensee partner. As already discussed in the section on subsidiary-level conditions, the implication of these entry modes for the evolution of the

subsidiaries and the generation of spillover potential has been limited mostly to the early phase of the subsidiaries, while other factors soon began to dominate the evolution of the subsidiaries.

The influence of national and regional policy does of course not stop with the MNE's entry decision, but continues throughout the lifetime of a subsidiary. The case studies demonstrate that national and regional authorities in China and India have encouraged (and sometimes enforced) linkages of MNE subsidiaries to domestic firms. Some of the older ventures in China and India were forced into equity alliances with domestic firms (e.g. L-C). But the formal requirements for foreign-owned ventures were gradually relaxed in both countries over the course of the past two decades. After few initial years, the MNEs therefore found ways to terminate their alliances and to operate as wholly- or majority-foreign-owned ventures. The separation from the domestic partners was not experienced to have harmed the subsidiaries' relations to authorities, suppliers, or sales channels. But several informal aspects were still observed to discriminate against foreign-owned ventures. This includes preferential access to information or public tenders. However, while the subsidiaries in both countries observed such mechanisms in their business environment, they were never forced to partner with domestic firms or to share critical technology in order to be able to conduct their business.

Besides such aspects related to ownership, another regulatory measure to induce foreign-local linkages observed in the case studies are local content policies. These policies have played an important role in China's and India's automotive and lighting industry throughout the 1980s and 1990s. In particular in automotive, the growth of the domestic industry in both China and India has been related to a considerable extend to strict local content requirements. But in particular with the WTO accession of China in 2001 and accelerated deregulation in India since the turn of the century, local content requirements were gradually relaxed (KUMARASWAMY et al. 2008, HOLWEG et al. 2009). The case studies suggest that these requirements did not have a strong impact on the evolution of the subsidiaries in China and India. Only in very few cases, investment or know-how transfer beyond the MNEs' already ambitious localization strategies were required by such policies. A policy-induced formation of foreign-local linkages has therefore not contributed significantly to the embeddedness of the subsidiaries and therefore to the generation of spillover potential.

Regional and national authorities (again mainly in China) were also ambitious to induce the MNEs to transfer higher value-add activities to their subsidiaries in an attempt to strengthen the technological capabilities in the economy. For FDI projects, the authorities applied a mix of *hard* (e.g. local content policies) and *soft* measures (e.g. subsidies or tax holidays) to

induce the transfer of value-add to the host country.[55] When AC-C was established in Suzhou, for example, the authorities of the Suzhou Industrial Park requested A-PARENT to include a R&D center to attract qualified jobs and additional knowledge-intensive operations to the region. And in the case of L-C, city and provincial authorities repeatedly attempted to convince the subsidiary to expand its operations into solid-state lighting technology in order to create a nucleus for further economic development of the region. The interviews suggest that these and other measures have accelerated the speed of upgrading of certain subsidiary operations and therefore the potential for a spillover of more sophisticated technologies and knowledge to domestic firms.

In India, the MNE subsidiaries have experienced national and regional authorities as rather passive. While the central government has introduced a range of general and sector-specific economic development plans, the subsidiaries did at no time feel pressured or encouraged to upgrade the scope or value-add of their operations.

More indirectly, the investment of authorities in creating enabling conditions in the host environment (e.g. infrastructure, education, IP protection, and other public goods) have also influenced the generation of spillover potential by the MNE subsidiaries. The implications of such public goods for the evolution of the subsidiaries have already been discussed at length in *chapter four*. This discussion has revealed that that the business environment in China has encouraged the two MNEs to upgrade their operations in this country, while this has not been the case in India. The advantage of China's business environment lay mainly in the strong infrastructure and supplier industries. However, (perceived) insufficient IP protection in China has functioned as a barrier to the transfer of knowledge-intensive activities to China and has therefore impeded the generation of even more spillovers. Shortcomings in India's business environment from the perspective of the two MNEs were the underdeveloped infrastructure and supplier industries, strict labor laws, and bureaucratic hurdles to investment and trade. These shortcomings have discouraged the MNEs to demonstrate more commitment in upgrading their subsidiaries' operations in India and, therefore, to generate more spillover potential.

6.6.2 Conditions on the level of knowledge-receiving organizations

Effective spillovers from MNE subsidiaries to domestic firms and institutions do not occur automatically, but require sufficient levels of absorptive capacity as well as motivation and

[55] See *chapter four* for a detailed discussion on the impact of national and regional authorities on the upgrading of the subsidiaries' operations.

investment of the *receiving* organization (MEYER and SINANI 2009). In the following, evidence for these mediating conditions in the case studies will be discussed. Moreover, the role of national and regional policy in reinforcing these conditions will be assessed.

Capacity and motivation to absorb spillovers

According to MEYER (2004), "*a broad consensus suggests that local firms need a certain level of indigenous human capital to be able the benefit from knowledge transfers by multinational enterprises*" (MEYER 2004: 263). Underlying this observation is the concept of absorptive capacity, which assumes that firms need prior knowledge to identify, absorb and exploit new knowledge (COHEN and LEVITHAL 1990). Several studies on MNE spillovers found confirmation for the relevance of absorptive capacity of recipient organizations for effective spillovers (see e.g. MEYER and SINANI 2009 for a review of this literature).

The interviews in the subsidiaries and with external partners suggest that the lack of prior (related) knowledge in the partners' organizations has in fact impeded them to benefit (even more) from the learning potential embedded in their linkages to the MNE subsidiaries. In particular the lack of basic technical and management competencies (e.g. mechanical engineering, quality or supply chain management) has impeded greater learning effects. In some cases, capable engineers (often with prior MNE experience) were available to interact with the subsidiaries on a sophisticated level. But the overall depth of knowledge and experience in the partners' organizations was often not sufficient to implement new concepts or technologies discovered in interactions with the subsidiaries.

The lack of prior knowledge was particularly prevalent in India. When L-I in Delhi started to work with domestic suppliers back in the 1990s, it experienced a tremendous gap between the subsidiary and external partners not only in terms of technology, but also in all kinds of managerial and organizational skills. Most suppliers in the region (and for certain parts also on the national level) had never worked for a developed-market MNE before and were not used to their standards. Linkages to these firms were often only possible because L-I did not aim at the MNE's global quality and performance parameters, but settled for the lower requirements of the Indian market. The interviews with external partners and in the subsidiaries suggest that in these early linkages the suppliers have only been able to absorb a fraction of the MNEs' spillover potential because they have lacked fundamental knowledge how to integrate it with their existing systems and processes.

On the other end of the spectrum – as in the case of AC-C in Suzhou – the technology gap between the MNE subsidiary and domestic suppliers was more moderate. When AC-C had

entered the Chinese market a decade ago, firms in the Yangtze River Delta had already accumulated considerable experience in the automotive industry.[56] In parallel, a capable supplier industry had developed in the region. The more sophisticated suppliers (in particular those with prior MNE experience) found it easier to make effective use of the knowledge and (process) technology of the MNE subsidiaries. But owed to the specific requirements of its automotive electronics products, AC-C was forced to work also with suppliers with very rudimentary automotive domain knowledge. Nevertheless, the comparison of two cases shows how the evolutionary stage of industries in general and of individual recipient firms in particular can affect the ability of firms to make effective use of spillover potential.

It is now broadly accepted in the literature that the technological upgrading of developing-country firms in linkages with MNEs "*[...] is something which cannot be achieved 'overnight' or automatically. Instead, if it ever occurs, it is out of a cumulative process of learning within the firm*" (DANTAS et al. 2007: 25, emphasis in the original). Such cumulative learning requires stable workforces. But in emerging economies such as China and India with their often very strong fluctuation rates, this is a critical issue. A technical expert in AC-C, for example, observed that the strong fluctuation of workers and engineers has impeded their domestic suppliers to accumulate knowledge in their organizations and therefore their ability to make effective use of the spillover potential:

> *On the supplier side, the stability of people is a big problem. You develop them for two or three years, and then you have some people who can do good things. But after two years the people leave. [...] Then you have to start all over again. This happens very often in China. […] We had a supplier for machining parts. Last year it was running well. […] But this year after Chinese New Year […] half of the people were gone. They tried to hire new people, but the job market was difficult.* (Manager Machinery, AC-C)

Interviews in other subsidiaries confirm the finding that the fluctuation in domestic firms has often constituted a major barrier for these firms to make effective use of the spillover potential embedded in their linkages to MNE subsidiaries.

Inter-firm learning is not only a cumulative, but also an interactive process. Frequent (and preferably face-to-face) interaction of firms reduces cognitive distance and might therefore facilitate the transfer and effective absorption of (tacit) knowledge by recipient firms (LUNDVALL 1992, DANTAS et al. 2007). Geographic proximity of firms facilitates such frequent interaction and therefore inter-firm learning (MASKELL and MALMBERG 1999).

The case studies provide a range of examples for the merits of geographic proximity. The lead engineer of SA-C1, for example, reported that the co-location with AC-C in Suzhou has

[56] Shanghai Volkswagen (a JV between Volkswagen and SAIC), for example, has already been established in 1984. A number of other multinational and domestic automotive firms cluster in Shanghai and in the Yangtze River Delta.

greatly facilitated the efforts of SA-C1 to adopt a sophisticated quality management system from the subsidiary. In the early phase of their relation, engineers of SA-C1 had visited AC-C at least on a weekly basis. From this interaction, the supplier learned about the technical and organizational challenges of establishing a quality management system. The lead engineer of the supplier was convinced that without these frequent visits *on the other side of the street* at AC-C and the continuous interaction with AC-C's engineers, SA-C1 would not have been able to implement such a system. Interviews in the other subsidiaries confirm the merits of geographic proximity for the effective absorption of spillover potential.

However, despite these and other compelling examples, geographic proximity did not appear to be a required or even sufficient condition for effective spillovers. Evidence was found for both failed spillovers to regional suppliers and successful spillovers to distant suppliers. A sourcing manager of AC-C, for example, reported about failed (or at least disappointing) attempts to upgrade some suppliers in close proximity to AC-C and concluded that the success of *supplier development* programs has not differed significantly between proximate and distant suppliers. The interviews in AC-C – and also in the other cases – suggest that the success of such programs has rather depended on prior experience, technological sophistication, and initiative and investment of the suppliers.

Besides such spillovers in linkages to domestic firms, the subsidiaries were also found to impact unrelated firms in the same, related, or unrelated industry sectors.

The capacity of recipients to make effective use of spillover potential depends on a range of factors. Building on the concept of absorptive capacity, GIULIANI and BELL (2005) argue that a cluster of firms and institutions might not absorb knowledge from MNEs uniformly through all actors, but rather selectively through those with the least cognitive distance from the technological level of the MNE. Among other factors, this cognitive distance is related to prior experience. The interviews provide tentative indication that in particular domestic firms with prior experience in serving other MNEs were able to benefit from a spillover of the MNEs' knowledge. The interviewees observed a superior ability of these firms to make sense of the bits of knowledge leaking the MNE. Also the employment of experienced staff from MNEs was also found to reinforce the absorptive capacity of domestic firms. A R&D manager of AC-C, for example, reported that several of his colleagues had left to work on similar technologies in a competing firm. He argued that the experience of these engineers in AC-C's processes and systems has reinforced the ability of this competitor to monitor and

absorb knowledge from AC-C. Interviewees in other subsidiaries expressed similar concerns associated with the fluctuation of experienced personnel.

The capacity of domestic firms to make effective use of spillovers from the MNEs was also related to complementarities between the firms' technology and market scope. Domestic firms in the same industry might be the only ones to make effective use of specific product- or process knowledge in a particular industry domain. But also related industries with an certain overlap in technologies might benefit from technological spillovers. In the case of the automotive electronics production of AC-C in Suzhou, for example, consumer electronics firms in Suzhou and the Yangtze River Delta proved to have benefited significantly from the presence of AC-C. Due to the overlap in SMT (surface-mount technology) technology between the two sectors, the consumer electronics firms were able to adopt (fragments of) AC-C's quality management system as well as process and material specifications. The strict quality focus in automotive was found to be a valuable complement to the predominantly cost- and scale-driven consumer electronics business. Similarly, complementarities between the R&D activities of L-I in the field of electronic ballast as well as the consumer electronics and IT-hardware industry in Delhi have facilitated spillovers from L-I into the region. These observations support the relevance of *related variety* for inter-industry spillovers to occur (see e.g. FRENKEN et al. 2007).

Where such complementarities between industry sectors were missing, the potential for spillovers (of specific technological knowledge) was impeded. In the case of L-C in Foshan, for example, the manufacturing head argued that other large manufacturing industries in the region (e.g. mechanical equipment and ICT) had only little to gain from L-C's domain expertise in traditional lighting. Only in the emerging field of solid-state lighting technology, spillovers to the related photovoltaic industry were likely. But the activities of L-C in this field were only rudimentary, and actual spillovers were not (yet) observable.

Besides these considerations regarding cognitive and technological distance, spillovers to unrelated firms and institutions were also found to be sensitive to physical distance. The co-location of domestic firms and MNEs-subsidiaries might generate an *industrial atmosphere* and *buzz* in the sense of common knowledge bound to that particular region (MARSHALL 1927, STORPER and VENABLES 2004). This common knowledge might foster the ability of domestic firms to decode information leaking from MNE subsidiaries. Physical (or geographic) proximity facilitates the comparability of operations and cost structures and might therefore foster inter-firm learning through demonstration effects (MALMBERG and

MASKELL 2006). The interviews provide tentative indication that the spillover of more general (organizational or managerial) best practices not related to the subsidiaries' core technology has in fact benefited mostly firms in the same region, while the spillover of specific product or process knowledge was less space-sensitive and was absorbed by competitors with the least cognitive gap to the subsidiaries – irrespective of their location. Interviewees at L-C in Foshan, for example, observed a continuous leakage of best practices in quality management and other manufacturing-related fields to firms in Foshan and the Pearl River Delta. The spillover mechanisms (e.g. social networks of workers and engineers in the region, mobility of labor between firms, and the monitoring of MNE operations) favored location-bound spillovers. Interviewees in other subsidiaries confirmed the finding that relatively unspecific knowledge has disseminated mainly to firms in the region. Most of the observable spillover of lighting- or automotive-technology-related knowledge, however, appeared to be less space-sensitive. Those domestic firms that were perceived to have succeeded the most in adopting domain knowledge from the subsidiaries were not predominantly located in the region. However, the interviewees clearly lacked transparency of the *actual spillovers* from their plants, and the findings presented here should therefore be viewed as indications rather than as an accurate assessment of spillovers into the region.

The effective use of spillover potential by domestic partners as well as unrelated firms and institutions does not only require a sufficient stock of capabilities, but also the willingness to undertake dedicated efforts and investment (MEYER and SINANI 2009).

Among other factors, the motivation of competing or related firms in the host environment to undertake such efforts to learn from MNE subsidiaries was found to depend on the competitive pressure these subsidiaries create in the domestic market. As discussed before, the recent expansion of the researched subsidiaries into the mid-market of their host environment has increased direct competition with domestic firms. While most of these competitors continued to rely on cost advantages (e.g. associated with their lean structures or lower input cost), at least some of them have also increasingly undertaken efforts to upgrade their operations in order to keep track with the MNE subsidiaries. The ambition to beat the new entrants also in terms of quality and functionality has motivated a comprehensive monitoring of MNE operations and – when applicable – an absorption of best practices.

The motivation of domestic suppliers to learn in linkages to MNE subsidiaries was found to depend to a large part on the *entrepreneurial spirit* of the suppliers' management. The case studies provide several examples for how proactive investment of suppliers can facilitate

effective spillovers to occur. A supplier of L-I in Delhi (SL-I1), for example, has invested proactively in a new technology in order to expand its business with the subsidiary. According to the General Manager of SL-I1, the expansion in this technology has required investment in new machinery, raw material quality, and training of staff. Additionally, some of the existing processes in the plant had to be altered. Without the support of L-I's engineers, this upgrading process would not have been possible. As a result of this investment, SL-I1 was able to expand the scope and volume of its business with L-I in Sonepat (and has recently also with international plants of L-PARENT). Moreover, the new technology (and the advanced capabilities associated with it) has also helped it in its business with third-party customers in India. This example illustrates how domestic suppliers can utilize the technological capabilities and sophisticated requirements of MNE subsidiaries to proactively upgrade the product, value-add and geographic scope of their own operations. Interviews with other suppliers revealed similar examples for such proactive efforts of suppliers to benefit from spillovers from their MNE partners.

At the same time, the case studies demonstrate how insufficient levels of initiative on the level of domestic partners can impede an effective absorption of spillover potential. In most cases, this lack of initiative was owed to the hesitation of partners to undertake investment which was required to be able to make use of the spillover potential. In the case of a long-time Foshan-based supplier of L-C (SL-C1), for example, the supplier has rejected L-C's offer to support the supplier in upgrading its manufacturing lines. Such an upgrading would have required considerable investment from the supplier, while L-C was willing to support it with its technical expertise. But SL-C1 was not willing to undertake the investment and preferred to exploit its installed assets. Besides having missed an opportunity to upgrade its operations with the help of its MNE partner, SL-C1 now also runs the risk to lose (parts of) its business with the MNE. In a similar example, the former license holder of AM-C in Changsha has denied investment and improvements which would have been necessary to be able to co-evolve together with the subsidiary. The General Manager of AM-C reported:

> *We planned to continue supply relations with our former licensee. But he did not meet our quality requirements. And he did not make sufficient efforts to improve. Then you lose your business with [A-PARENT] immediately.* (General Manager, AM-C, trans.)

The initiatives of the subsidiaries with public partners in the field of vocational training offered considerable spillover potential for domestic firms in the region, which also struggled with qualification levels and the increasing scarcity of qualified labor. But the case studies

found that domestic firms hesitated to participate in these initiatives or to invest in similar training programs internally. The HR Director of L-C in Foshan, for example, observed:

> *For them [domestic firms] it is not interesting to do a three-year program. One reason is cost: three years investment is not a small amount. And second is they cannot wait for three years. They want employees now, so it's more interesting to target experienced workers.* (HR Director, L-C)

Interviews at AC-C in Suzhou revealed a similar hesitant attitude of domestic firms. This hesitation to absorb best practices in vocational training was mainly related to the dominating HR concept of Chinese (and to a lesser extent also of Indian) firms: a relatively high share of manual, repetitive work performed by mostly unqualified (and therefore cost-efficient) workers. In this concept, investment in training of shop floor staff was not given the same priority as in the German-based MNEs with their more demanding job profiles (as well as higher quality standards). Experts in the German Chamber of Commerce in Shanghai argued that even though until now the domestic firms in China have been successful with their flexible and cost-efficient model, the virtues of vocational training might soon be recognized also by these firms when the scarcity and rising cost of labor will require an automation of their lines and therefore higher skilled labor.

Besides the willingness to undertake (financial) investment, the effective realization of spillover potential was also found to require sufficient levels of openness of recipient firms and institutions to appreciate new ideas and to welcome change in their organization.

The case studies identified several success stories of domestic suppliers eager to absorb every bit of knowledge the MNE subsidiaries could offer them. A supplier of mechanical components to L-I in India (SA-I1), for example, had repeatedly sent its key personnel including the CEO to L-I to learn about managerial and organizational best practices. Some of these practices could later be implemented at the supplier (e.g. in quality management).

Some other suppliers, however, failed to demonstrate sufficient levels of openness to make effective use of the spillover potential. In the case of AC-C, for example, some Suzhou-based suppliers with a customer-electronics background were reluctant to comply with the strict qualification procedures in the automotive industry, which would have required some extra work in the qualification process.[57] This has repeatedly caused problems for AC-C with its OEM customers. From the perspective of the suppliers, the business with AC-C did not justify changes to their established procedures. The Regional President of AC-C reported:

[57] This includes the requirement to report any (minor) change affecting the manufacturing line or material inputs to the *tier-one* supplier and consequently to the OEM.

> *Some of our suppliers think they can do what they want. […] If you talk to the supplier he would tell you: I am doing it like this for every customer. Your automotive business is less than one percent for me, so why should I care.* (Regional President E, AC-C)

With this attitude, the Regional President argued, the supplier have missed a good opportunity to use the experience of A-PARENT to improve their currently only very rudimentary material qualification system.

Also in the area of vocational training, the inertia of some *recipient* institutions was found to have impeded promising opportunities for spillovers. The training head of L-I in Delhi, for example, observed that the public vocational training institutes surrounding the plant have not demonstrated sufficient openness to utilize the experience of the MNE:

> *These government employees joined thirty years back. They are not aware about the latest technology. So in the starting years we called the instructors over for seminars to show them how we conduct the training. [...] But they were hesitant, because they have been doing it their way for a long time. [...] In ten years we have not succeeded [in improving them] as much as we should have.* (Manager Training, L-I)

Similarly, the HR head of AM-I in Bangalore reported about learning barriers related to attitudes and adverse informal practices in some of the associated public training institutes:

> *The problem in India is that there is a lot of corruption, in all sectors of life. You asked me about the ITIs [Industrial Training Institutes] looking for help from the private sector, trying to make improvements: This process [...] would have been much faster and better had the whole system not been so corrupt.* (General Manager HR, AM-I)

These and other findings in the case studies demonstrate that the effective absorption of the spillover potential associated with the presence of MNE subsidiaries does not only depend on the (technical) capabilities and social ties of recipient firms, but also on their (endogenous) motivation to undertake efforts and investment as well as on their openness to change.

Impact of domestic policy and government on recipient firms and institutions

Policy of national and regional authorities was found to influence the capacity and motivation of firms to make use of the spillover potential of MNE subsidiaries in manifold ways.

First and foremost, authorities on the national and regional level were found to strengthen the absorptive capacity of domestic firms by providing public goods such as education. The interviews with the subsidiaries and their external partners suggest that the insufficient quality of (vocational) education in both China and India has been a major hurdle for the upgrading of domestic firms in linkages to the subsidiaries. Improving the quality of vocational training could therefore be a major contribution of authorities to foster the absorption of spillover potential by domestic firms. In China, education in general and practical qualification on the

vocational level in particular has received increasing attention of authorities on the national and provincial level over the past decade (FAN 2006). An expert at the German Chamber of Commerce in Shanghai observed that the broad focus of the *11th Five Year Plan* (2006 to 2010) on education on different levels (and not only university education) has generated increasing attention among city and provincial authorities on training on the vocational level. In this situation, city and provincial authorities as well as educational institutions were very receptive to the qualification needs and training initiatives of the subsidiaries. However, the authorities did not appear to have made dedicated efforts to *mainstream* the MNE's successful vocational training approaches in their region (e.g. by using them as blueprints for other public training institutions or by encouraging domestic firms to engage in similar initiatives). Interviews in the training institutes and with experts in the German Chamber suggest that the main intention of the authorities for their support of the subsidiaries' initiatives might have been to attract additional FDI from the subsidiaries' home markets into the region rather than to reinforce human capital for sustainable regional economic development.

Similarly, education and in particular vocational training has been placed high on the agenda of India's central government in the past decade. The *10th Five Year Plan* (2002 to 2007) of the Indian government, for example, states that "*it is necessary to expand the secondary stream with particular emphasis on vocational training*" (INDIA PLANNING COMMISSION 2001: 9). But the plan also makes clear that the private sector is expected to drive progress in vocational training, since most public resources for the plan period are devoted to elementary education (INDIA PLANNING COMMISSION 2001). This lack of public resources for vocational training was also observed by the subsidiaries. The training head of L-I in Delhi, for example, reported that the failure of regional vocational training institutes in cooperating with (and therefore learning from) the subsidiary has been partially owed to the lack of funding for lecturers, equipment, and adequate training facilities. This lack of funding – together with the general lack of practical exercise – appears to have been one of the main shortcomings in India's vocational training. The observed lack of (technical) capabilities in many domestic firms was at least partially related to this shortcoming. Despite the emphasis of policy on vocational training and the role of the private sector, regional authorities in Delhi-Sonepat and Bangalore were not found been very receptive to the MNEs' initiatives in the field of vocational training. Such initiatives were not mainly viewed as opportunities to enhance the overall quality of vocational training in the region, but often as interferences with the public (educational) administration domain.

Environmental and safety regulation for products and production processes was identified as another important policy area with potential impact on the absorptive capacity of domestic firms. Low environmental and safety standards might secure cost advantages of domestic firms on the global market. But at the same time, such standards reduce pressure to invest in product and process upgrading. In contrast, more challenging standards might encourage or enforce upgrading processes and thereby stimulate the absorption of best practices from co-located MNE subsidiaries (at the risk of *crowding out* weaker domestic firms).

In the Indian lighting industry, two of the component suppliers of L-I in Northern India (SL-I1 and SL-I2) reported that the significant regulatory gap between India and the world market had made it very difficult to enter the MNE's supply chain. The suppliers were convinced that stricter requirements in the domestic market would eventually reinforce the capabilities of domestic firms.[58] The suppliers as well as managers at L-I observed that the current trend towards stricter regulation (e.g. regarding the lead content in products) was forcing domestic firms – including the two interviewed ones – to find input alternatives and to upgrade parts of their manufacturing processes in order to reduce pollution. These efforts help to narrow the gap between these firms and the (global) requirements of MNEs such as L-PARENT, which might eventually facilitate vertical linkages and knowledge exchange between the two groups. However, this regulation-induced pressure to innovate and upgrade has been watered down successfully in the past by lobby groups. With their broad representation of all lighting firms in the country, the lighting association ELCOMA was careful not to tighten regulations too fast in order to allow for all domestic firms to catch up.[59] Interviewees at AC-C observed that the tightening of environmental and safety regulations in the domestic automotive industry has gradually enhanced the sophistication of operations and products of domestic suppliers. The interviews suggest that the narrowing of the technology and capability gap between the domestic supply industry and AC-C (as well as other MNE subsidiaries) has created additional opportunities for linkages and spillovers.

A similar mechanism could be observed with regard to labor standards and wages in the host environment. In China, national and provincial authorities have been increasingly committed in the past decade to improve labor standards (e.g. minimum wages and labor dispute resolution) in the industrial centers on the east coast (WORLD BANK 2008). By deteriorating the cost position of firms located in these locations on the world market, this policy might

[58] Not all Indian manufacturers of mechanical equipment would agree to this statement. The two interviewed firms were clearly among the more (technologically) sophisticated firms in their industry and did therefore expect an improvement of their competitive position in the domestic market if regulations were to be reinforced.

[59] ELCOMA: Electric Lamp and Component Manufacturers' Association of India.

encourage (technological) upgrading efforts of domestic firms. An expat manager of L-C in Foshan, for example, observed that some of its domestic suppliers have recently started to invest in the automation of their production lines in order to reduce their headcount (growth) in the course of stricter labor standards and increasing salary levels. These automation efforts have contributed to narrow the suppliers' technological gap to L-C and therefore to strengthen their ability to make effective use of L-C's spillover potential. Interviewees in AC-C in Suzhou observed similar upgrading trends among their suppliers motivated by the increasing cost (and shortage) of labor. In the case of the Indian case studies, such a mechanism could not be observed. However, recent reports on economic dynamics in Bangalore suggest that such developments might also take place in the booming regions of India (GLAESER 2010).

Policy initiatives to encourage the formation of industry and technology clusters can induce effective spillover from MNE subsidiaries to domestic firms. The Suzhou Industrial Park – the location of AC-C – was established more than a decade ago in order to induce the agglomeration of firms in high-technology fields. The combination of technological complementarities and geographic proximity of the automotive electronics unit of A-PARENT and a range of domestic and foreign consumer electronics manufacturers has induced two-way spillovers between these related industry sectors.[60] Ambitious cluster policies were also observed in the case of the solid-state lighting cluster in the Pearl River Delta (L-C) and in the case of the emerging automotive cluster in Changsha, Hunan Province (AM-C). In both cases, provincial and city authorities invested heavily in infrastructure and other public goods, and offered generous incentives to foreign and domestic firms. By fostering the agglomeration of competing and related firms in these locations, the formation of linkages between MNEs and domestic firms as well as the occurrence of (unintended) spillovers to the region has been facilitated.

In particular in the case studies in China, city and provincial authorities were eager to induce demonstration effects from MNE subsidiaries. In the case of AC-C, for example, the high standards the subsidiary have inspired social- and environmental-awareness campaigns by authorities of the Suzhou Industrial Park and the city administration in an attempt to induce a spillover of these standards to domestic firms. Similar observations were made in the case of L-C in Foshan and AM-C in Changsha. Compared to these findings in China, the interviews in the Indian subsidiaries suggest that authorities in the National Capital Region in Northern

[60] The role of geographic proximity in such agglomerations of firms for the spillover of knowledge and technology has already been discussed earlier in this chapter and shall therefore not be repeated here.

India and in Bangalore in the South have demonstrated less ambition to use the MNE subsidiaries as role models for domestic firms.

With the data and methodology used in this dissertation, these findings should be viewed as indications for the mechanisms underlying the effective absorption of MNE spillover effects rather than as general rules for MNE spillover in emerging economies. Further qualitative and quantitative research on the themes discovered in this dissertation will be required to establish a firm base for policy recommendations as well as theory development.

6.7 Conclusion

Drawing on interviews in MNE subsidiaries and selected external partners in China and India as well as in the respective HQs in Germany, this chapter has enhanced transparency of MNE spillover effects in emerging economies. It has analyzed different spillover mechanisms and has attempted to assess the consequences for domestic firms and regions. Moreover, it has analyzed mediating conditions under which spillover potential is likely to be generated by *knowledge-originating* MNEs and absorbed by *knowledge-receiving* domestic firms. For analytical purposes, the external impact of subsidiaries was distinguished in knowledge and technology transfer in linkages to domestic partners and (mostly unintended) spillovers to unrelated firms and institutions. Particular focus was given to backward linkages to domestic suppliers.

In terms of linkages to domestic partners, the case study results resemble findings in prior studies on the external impact of MNE subsidiaries and demonstrate that backward linkages to domestic suppliers are particularly important channels for transferring knowledge and technology to the host environment (GIROUD and SCOTT-KENNEL 2006). Suppliers were found to benefit from such linkages by upgrading the technological and managerial sophistication and value-add scope of their operations. Moreover, the suppliers have also benefited from scale economies and reputational gains and therefore enhanced competitiveness in their business with the MNE as well as with third-party customers. But despite this evidence for an MNE-led upgrading of the selected suppliers, these firms have largely remained on the lower end of the potential upgrading path for developing-country firms (i.e. from assembly to original design or brand manufacturer) (see e.g. HOBDAY 1995). The observed spillovers were the result of both proactive *supplier development* efforts by the subsidiaries and more indirect demonstration and motivating effects. While all subsidiaries were found to have disseminated at least some knowledge to their suppliers, considerable

differences could be observed between subsidiaries of the two MNEs and in the two host countries.

Embedded forward linkages to customers or horizontal linkages to competitors were rare in the researched cases and did not – with few exceptions – contribute substantially to the spillover of knowledge and technology. Linkages to non-business actors were particularly relevant in the area of vocational training. But despite several long-term initiatives of some subsidiaries, a sustainable impact on recipient institutions and the regional environment was not observed. Linkages to universities were mainly restricted to recruiting, and no efforts to engage in joint knowledge generation could be observed.

In terms of spillovers to unrelated firms or institutions, the case studies suggest that knowledge and technology dissemination occurred mainly through labor mobility and demonstration effects. The predominantly market-seeking mandates of the subsidiaries were also shown to create competitive pressure for domestic firms to improve their quality and engage in (moderate) technological upgrading initiatives. Additional effects, such as a *crowding out* of domestic firms or the spin-off of new firms, were not observed.

This positive yet overall moderate external impact and the observed differences between the subsidiaries emphasize the importance of investigating more closely into the underlying conditions. *On the level of the subsidiary*, the findings suggest that the sophistication of a subsidiary's operations and capabilities is crucial for the generation of spillover potential. In many cases, the upgrading of external partners was closely tied to the upgrading of the subsidiaries. However, it was also shown that spillover from such operations does not occur automatically, but depends to a considerable extent on the subsidiary's propensity to link to domestic firms and to engage in proactive upgrading efforts. This propensity was mediated mainly by the subsidiary's mandate, capabilities, and – in the initial phase – its entry mode.

On the level of the MNE HQ, the investment motive was shown to play an important – although ambiguous – role for the generation of spillover potential. Both market- and export-seeking strategies were shown to (potentially) generate spillovers. The actual impact of either strategy was found to depend strongly on the evolutionary stage of the host environment (e.g. the sophistication of supply industries) and the absorptive capacity of recipient firms. The willingness of HQ to encourage (or tolerate) external linkages and efforts to support external partners was also found to be mediated by both industry characteristics and individual corporate culture. The country-of-origin effect could not be tested with the case studies. However, anecdotal evidence from interviews with suppliers suggests that it might also play an important role as mediating condition for MNE spillover effects.

On the level of recipient firms and institutions, the findings demonstrate that the effective absorption of spillover potential is influenced by the capabilities as well as the motivation and attitude of recipient organizations. It was shown that the lack of prior knowledge and/or stable workforces impedes the effective use of spillover potential. Likewise, the lack of initiative and/or inertia in recipient organizations was found to impede effective spillovers – suggesting that learning from MNEs requires actual effort and investment beyond mere capabilities. Concerning spillovers to related industry sectors, complementarities in technologies, competency requirements, and markets were found to facilitate the spillover of specific knowledge and technology, while general (organizational and managerial) best practices might also spill over to unrelated industry sectors. Geographic proximity was found to facilitate spillovers to linkage partners and unrelated firms. In linkages to suppliers, the frequency of face-to-face meetings was found to reinforce social relations and trust between firms and therefore the absorptive capacity of suppliers. However, co-location with MNE subsidiaries alone was shown to be insufficient to compensate for a lack of initiative and investment of recipients. In terms of spillovers to unrelated firms, the data and methodology did allow for an accurate assessment of the relevance of geographic proximity. But the interviews provide tentative indication that the spillover of general best practices not related to the subsidiaries' core technology has benefited mostly firms in the region, while the spillover of specific product- or process-related knowledge was less space-sensitive and was absorbed by competitors with the least cognitive distance to the subsidiaries – irrespective of their location in the host country.

And finally, *national and regional policy* was shown to influence both the generation of spillover potential as well as the effective absorption of this potential in the host environment. MNEs and their subsidiaries might be less receptive to domestic policies than domestic firms, but the case studies demonstrate that national and regional policy and initiatives of public institutions can matter a great deal to a subsidiary's motivation (and ability) to upgrade its operations, to form linkages, or to upgrade its supplier's operations. In terms of strengthening the absorptive capacity of recipient firms, (vocational) education and challenging regulations was found to have played an important role for effective spillovers in the case studies.

Part D: Conclusion

7 Conclusion

7.1 Answers to the research questions

Based on in-depth case studies on six MNE subsidiaries in China and India, this dissertation has applied a micro-level approach to the evolution and external impact of MNE subsidiaries in emerging economies. This research focus was inspired by the observation that the microfoundations of these two related phenomena on the level of individual subsidiaries and in the interplay with their MNE-internal and -external environment are not sufficiently understood in the literature on MNE subsidiaries. In the following, the findings of this dissertation will be summarized along the guiding research questions.

- ***How can subsidiary evolution be conceptualized and measured?***

As discussed in *chapter one*, International Business (IB)/Strategic Management scholars have created a variety of typologies to reflect the different roles and responsibilities of MNE subsidiaries (see e.g. WHITE and POYNTER 1984, BARTLETT and GHOSHAL 1989, JARILLO and MARTINEZ 1990). The *classic* typology of WHITE and POYNTER (1984) defines a subsidiary's role based on three measures (product-, geographic-, and value-add-scope). Different combinations of these measures give rise to five distinct subsidiary roles. While these typologies facilitate the identification and description of subsidiary evolution, they do not answer the question *how* and *why* subsidiaries change their roles over time. A new research stream in Strategic Management since the 1990s – often associated with BIRKINSHAW and HOOD (1998) – has attempted to fill this gap with a more dynamic view on the evolution of MNE subsidiaries. In this literature, the term *evolution* is used in rather broad terms to describe an up- or downgrading of a subsidiary, irrespective of whether this change was driven by actual evolutionary developments or by a mere external shock. Studies on subsidiary evolution frame the phenomenon in different ways: some studies focus on a subsidiary's operations and investigate changes in the variety of products manufactured or geographic markets served (see e.g. DELANY 1998, DOERRENBAECHER and GAMMELGAARD 2006). Other studies focus more on the capability side and investigate changes in a subsidiary's *innovative competencies* (FUCHS and WINTER 2009) or *innovative capabilities* (KOKKO and KRAVTSOVA 2008). Yet another perspective on subsidiary

evolution is concerned with the changing strength of a subsidiary's *embeddedness* in its MNE-internal and -external network (see e.g. DROGENDIJK 2005).

- ***Which theoretical explanations and empirical evidence for subsidiary evolution can the International Business/Strategic Management literature on the MNE provide?***
- ***What can other literature streams contribute to explain subsidiary evolution, in particular with regard to the embeddedness of subsidiaries in space and place?***

In *chapters three* and *four*, this dissertation has assessed the (potential) contribution of different research streams to the analysis of subsidiary evolution. Most importantly, it has drawn on concepts in International Business (IB)/Strategic Management and Economic Geography. In the IB/Strategy literature, the MNE subsidiary has increasingly moved to the center of attention. With the recognition that subsidiaries – even the ones in peripheral markets – are not mere recipients of knowledge and mandates from the HQ, but might actually augment the MNE's competitive advantage, aspects of learning and innovation on the subsidiary-level and in the MNE-internal network have received increasing research attention (CANTWELL 2009). Building on BIRKINSHAW and HOOD (1998), a specialized stream of IB/Strategy literature began to investigate the drivers and mechanisms underlying the evolution of MNE subsidiaries. This literature explains subsidiary evolution as a function of HQ-level assignment and support, subsidiary-level capabilities and initiatives, and *environmental determinism*. Evolution drivers identified in empirical studies include MNE strategy and investment motive, attitudes and social relations of different actors in the MNE, subsidiary-level capabilities and upgrading initiatives, as well as factor conditions in the host environment (DOERRENBAECHER and GAMMELGAARD 2006, EGERAAT and BREATHNACH 2008, FUCHS and WINTER 2009). Some recent contributions on MNE subsidiaries move away from the MNE-centric focus and emphasize the role of external linkages in fostering subsidiary evolution (ANDERSSON et al. 2007, PHENE and ALMEIDA 2008).

Despite a revival of interest in the role of location for the MNE's competitive advantage in IB/Strategy in the 1990s (see e.g. PORTER 1994, DUNNING 1998, CANTWELL 2009), aspects related to space and place remain an under-researched contingency in the literature on the MNE and MNE subsidiary evolution (BEUGELSDIJK et al. 2010). Economic Geography can contribute to address these shortcomings. By focusing on economic, institutional, and relational dynamics in space and place, this literature reveals important factors which might encourage, enable, or impede the evolution of MNE subsidiaries. Of particular interest in the

context of this dissertation are insights into the interactive and location-bound character of (inter-)firm learning (LUNDVALL 1992, MALMBERG and MASKELL 1999). Moreover, insights with regard to agglomerations effects associated with the clustering of competing and related firms and with regard to the role policy and institutions in fostering upgrading dynamics of firms in a particular location can add additional value to the analysis of subsidiary evolution. Economic Geography can therefore contribute to enhance transparency of the interplay of MNE subsidiaries in the external context.

- ***How do subsidiaries of developed-country MNEs evolve over time in dynamic emerging economies such as China and India?***

In line with the subsidiary typology of WHITE and POYNTER (1984), this dissertation has conceptualized subsidiary evolution as changes in the product, value-add, and geographic scope of a subsidiary's operations. In *chapter two*, this approach has been applied to the six in-depth case studies in China and India. This exercise has revealed that while the subsidiaries of both MNEs in China have experienced a significant upgrading of their operational scope, two of the three subsidiaries in India have stagnated or have even experienced a downgrading of their operational scope. The third subsidiary in India has just recently stabilized its operations, but has already demonstrated some upgrading dynamics. The evolution paths of the subsidiaries differed particularly in terms of their value-add scope. While the Chinese subsidiaries have developed increasingly comprehensive and technologically sophisticated manufacturing and R&D operations, the Indian counterparts have lagged behind in this respect and have even narrowed their value-add scope in certain areas. The product scope of the subsidiaries has constantly evolved with old products and technologies getting replaced by new ones. But as a general trend, the variety and complexity in the product portfolio has expanded over time in all researched subsidiaries. The geographic scope of the subsidiaries has remained constant or has even narrowed over time, and a substantial expansion of global responsibilities could not be observed in any of the cases. However, four of the six subsidiaries have recently expanded the geographic scope of their manufacturing and/or R&D activities towards other emerging economies.

- ***What are the drivers of subsidiary evolution in dynamic emerging economies such as China and India?***
- ***Which mechanisms on the subsidiary-level and in interaction with the MNE-internal and -external environment facilitate this evolution, in particular with regard to configurations and relations on the regional level?***

Chapters three and *four* of this dissertation provided an analysis of the drivers and mechanisms underlying the evolution paths in the six case studies. The concept of subsidiary evolution as a function of subsidiary-endogenous, MNE-internal, and external driving forces (BIRKINSHAW and HOOD 1998, TAVARES 2001) proved to be a good starting point for the analysis. However, the complexities of the MNE-internal and -external environment of a subsidiary observed in the case studies support the claim made in the introduction of this dissertation that the literature on subsidiary evolution has often blurred or neglected important driving forces, and that a more fine-grained, micro-level approach is required to investigate the underlying mechanisms of subsidiary evolution. This dissertation has therefore attempted to disentangle different organizational and geographic dimensions of a subsidiary's internal and external environment. To this end, two interrelated conceptual frameworks for the analysis of MNE-internal and -external evolution drivers were developed.

Applied to the six case studies, these conceptual frameworks revealed that the MNE-internal environment might be less monolithic than often assumed in the literature, and that an MNE's organizational structure as well as the motives and bargaining power of different actors (e.g. corporate and divisional HQs on different geographic levels) play an important role for subsidiary evolution. The MNE HQ was found to influence the evolution of a subsidiary by assigning mandates and offering support (e.g. expatriate staff) as well as by encouraging, tolerating, or restricting subsidiary-level initiatives. The Chinese subsidiaries of both MNEs were found to have received significantly more resources and support from their HQs than the Indian subsidiaries. This unequal allocation of HQ support in both MNEs was traced back to the relevance of the domestic market for the MNE, resources and strategic assets in the host environment, as well as social relations between HQ and subsidiary staff.

Concerning horizontal relations to sister subsidiaries, the analysis has generated new empirical insights into how horizontal knowledge exchange and competition influence the evolution of MNE subsidiaries. The analysis went beyond prior research by revealing how the specific characteristics of horizontal relations (*same-BU, integrated,* or *lateral* relations on different geographic levels) mediate the contribution of these relations to subsidiary evolution. Moreover, the analysis revealed that this contribution can differ significantly between different evolutionary phases of a subsidiary. Competition among sister subsidiaries

was mainly observed within and less across an MNE's business units. For the weaker subsidiaries in the MNE network (here: the subsidiaries in India), the impact of such competition on their evolution was ambiguous: on the one hand it has resulted in a loss of some of their mandates, but one the other hand these subsidiaries have benefited most from horizontal (cross-border) knowledge exchange. While the initial phase of the subsidiaries was mostly dominated by horizontal relations with (often lateral or unrelated) sister subsidiaries on the host country level, horizontal relations (mostly in the same BU) on the macro-regional (here: Asia-Pacific) and global level gained relevance with growing maturity of the subsidiaries.

In line with some of the more recent subsidiary-centric literature, the analysis has demonstrated that MNE subsidiaries are not mere recipients of HQ knowledge and mandates, but might play an active role in the evolution of their operations (see e.g. MARIN and BELL 2006, CANTWELL 2009). Initiatives of subsidiary management to foster the capabilities of its staff and to attract additional mandates from the MNE were important explanatory factors for the different evolution paths in the case studies. Path dependent mechanisms related to a subsidiary's entry mode and legacy in the host environment were found to facilitate subsidiary evolution during the initial phase, but to get soon evened out by other factors with growing maturity of the subsidiary.

The in-depth, micro-level approach of this dissertation has also served to enhance transparency of the interface of MNE subsidiaries and the external environment. For analytical purposes, the analysis distinguished between *direct* impact of the external environment on the subsidiary and *indirect* impact via the MNE HQ. Concerning direct impact, the sophistication of domestic supplier industries and human capital was shown to play a pivotal role for the evolution of a subsidiary's capabilities and operations. Scale economies related to the size of the host market were shown to influence subsidiary-level upgrading initiatives. And also the absorption of localized capabilities (in particular emerging-economy-specific capabilities such as low-cost design skills) was shown to have induced subsidiary-level upgrading initiatives in at least some of the subsidiaries.

Concerning indirect impact, the strategic behavior of both MNE HQs towards the subsidiaries was shown to be mainly influenced by the size of the accessible host market, but also by the regulatory framework, infrastructure, and supplier industries in the host environment. Furthermore, the existence of strategic assets in the host environment was shown to encourage a HQ-led upgrading of subsidiaries in the respective environment.

Most literature on subsidiary evolution remains focused on the configurations of the external context (e.g. factor conditions and policy) and neglects that a subsidiary's interface to the host environment consists to a considerable degree of linkages to specific external partners (FORSGREN et al. 1999, ANDERSSON et al. 2007). This dissertation has therefore made an attempt to incorporate linkages to external partners into the analysis. In-depth interviews with selected external partners generated insights into the interactive learning of MNE subsidiaries with external partners and how this might affect the evolution of these subsidiaries. The analysis revealed that frequent interaction and social ties facilitate the absorption of localized capabilities by MNE subsidiaries. However, mainly owed to the limited mandates of the subsidiaries (and therefore the absence of knowledge-seeking linkages), learning in linkages to external partners did not appear to have played a pivotal role for the development of unique capabilities profiles in the subsidiaries and – more generally – for their evolution.

This dissertation has paid attention to the spatial dimension of external evolution drivers – an aspect which has so far been largely neglected in the literature on subsidiary evolution. While the strategies and actions on the HQ-level towards the subsidiaries were shown to be mainly influenced by factors on the global and host country level, the capabilities and initiatives of the subsidiaries themselves were shown to be heavily influenced by (often location-bound) configurations and linkages on the regional level. In particular a region's endowment with qualified labor and suppliers functioned as an important enabling factor for subsidiary-driven upgrading dynamics. The limited mobility of labor across regions and the requirement for highly flexible (and therefore *local* or at least *regional*) supply has often prohibited attempts to tap into the resources of other regions. Agglomeration effects related to the proximity to competing and related firms were shown to have strengthened some of the subsidiaries – mainly by allowing for a monitoring and absorption of best practices. Regional policies and regulations were shown to influence the strategic behavior of subsidiaries – although the magnitude of this impact appeared to have been moderate in the case studies. And with regard to linkages to external partners, geographic proximity to partner firms was shown to foster knowledge exchange and interactive learning. In backward linkages to domestic suppliers, geographic proximity was shown to facilitate the localization of supply as well as joint optimization and innovation activities.

These findings suggest that an important part of the *external evolution drivers* of a subsidiary might be bound to its regional environment. However, the case study findings also demonstrate that strong regional environments are neither a necessary nor sufficient condition for subsidiary upgrading. While some subsidiaries have in fact been slowed down by

shortcomings on the regional level, in other cases these shortcomings were compensated successfully by bold support from the MNE and subsidiary-level efforts to link to other regions. And in fact, the most important external linkages in the case studies were not predominantly *regional*. However, with the increasing competitive pressure and the gradual deterioration of the MNEs' home-base advantage, the relevance of regional factors for the researched subsidiaries has clearly increased rather than decrease in recent years.

- ***How can qualitative research assess the 'relative importance' of explanatory constructs identified in case studies?***
- ***What can be inferred from subsidiaries in emerging economies such as China and India about the 'relative importance' of configurations/relations in the subsidiary-endogenous, internal, and external environment for subsidiary evolution?***

While case study research can explain how and why a certain outcome has occurred, it is ill-equipped to assess the magnitude of impact of isolated variables. *Chapter five* has therefore presented methodological considerations with regard to how case study research might nevertheless be able to assess the relevance of certain explanatory factors for an observed outcome. It was argued that the very strength of case study research is its ability to identify causal trajectories (in the sense of bundles of critical events and decisions) leading to an observed outcome. Consequently, an attempt was made to identify the causal trajectories underlying the observed evolution paths in the case studies.

The analysis revealed that the evolution of the subsidiaries of both MNEs in China has followed similar causal paths with strategies and actions of the HQ leading the way towards a dynamic upgrading of their operations. Capabilities and initiatives of the subsidiaries as well as horizontal relations with sister subsidiaries and external relations in the host environment were shown to have supported rather than determined these evolution paths. The dominance of the HQ dimension in the evolution paths in China was mainly owed to the relevance of the domestic market, which has encouraged bold, HQ-led upgrading initiatives as well as a tight integration of the subsidiaries in the MNE network. At the same time, the dynamic growth of the host market, together with the weak endogenous knowledge base, has impeded the accumulation of strong capabilities in the subsidiaries and therefore a stronger capability-driven character of the evolution paths.

In the case of the two older subsidiaries in India (AM-I and L-I), the dominance of the HQ dimension was less pronounced. This was mainly owed to the peripheral status of the domestic market (at least until the mid-2000s) as well as to shortcomings in the host

environment which have discouraged HQ-led upgrading initiatives. At the same time, upgrading initiatives on the level of the subsidiaries have been less ambitious and successful than observed in China. The stagnation (or even downgrading) of these subsidiaries was therefore owed to the simultaneous absence of HQ *push* and subsidiary *pull*. The (moderate) upgrading of the subsidiaries in the past few years was mainly related to the renewed interest of the two MNEs in the Indian market rather than to subsidiary-driven upgrading initiatives. The evolution path of the third Indian subsidiary (AM-I) was dominated by the global HQ. Owed to the fact that it has only been operational for few years, the accumulation of strong capabilities – and therefore a capability-driven evolution path – was impeded.

These mostly HQ-driven evolution trajectories suggest that the transformation of traditional HQ-centered MNEs into networks of knowledge-generating and strategically increasingly independent subsidiaries might not yet be as advanced as assumed in some of the literature (see e.g. ANDERSSON et al. 2007). This might be especially true for MNE subsidiaries in emerging economies. In fact, the dominance of the HQ dimension in the case studies was to a considerable extent owed to emerging-economy-specific characteristics (e.g. dynamic domestic market, weak knowledge bases, and poor IP protection). Similarly, the finding that localized linkages to partners have played only a minor role for evolution paths in the case studies suggests that some of the recent literature on MNE networks (see e.g. PHENE and ALMEIDA 2008) might overstate the relevance of such linkages for fostering the upgrading MNE subsidiaries. Again, this might be especially true for subsidiaries in emerging economies with their often restricted mandates and weak external knowledge bases. However, the case studies also suggest that the MNEs' awareness for the merits of emerging-economy-specific capabilities has increased in the past few years, and that their willingness to form knowledge-seeking localized linkages in such locations might therefore increase rather than decrease in the future.

- ***Which literature streams offer theoretical explanations for the external impact of MNE subsidiaries on the host environment? What empirical evidence is available?***

Chapter six of this dissertation has provided a review of literature on the external impact of MNE subsidiaries. Most of the earlier research has focused on horizontal (intra-industry) spillovers (see e.g. CAVES 1974). It has identified multiple spillover mechanisms including demonstration and competition effects, labor mobility, and enterprise spin-offs. In the past two decades, many scholars have shifted the research focus on the vertical impact of MNE subsidiaries on up- or downstream industries. In particular backward linkages to suppliers

were identified as a promising spillover channel. Spillovers to suppliers might result from direct support (e.g. the transfer of process technologies from MNEs) as well as indirectly from demonstration and motivation effects (GIROUD and SCOTT-KENNEL 2006). By linking to an MNE's global production network, domestic suppliers might benefit from additional learning effects and scale economies (ERNST and KIM 2002, IVARSSON and ALVSTAM 2010). Spillover effects in forward linkages to domestic customers were found to be mostly associated with the supply of high-quality and/or cost-efficient components and with the training of customers in sales- or distribution-related matters (MEYER 2004). Despite a rich body of literature, empirical evidence for these spillover mechanisms remains inconclusive. Several studies find evidence for spillovers in backward linkages (at least for the developed economies), while evidence for spillovers in forward linkages and horizontally between industry sectors is scarce (BEUGELSDIJK et al. 2008). This inconclusive empirical evidence, together with the recognition that spillovers might not occur automatically from the mere presence of MNEs in the host country, has motivated research on the mediating conditions of spillovers. While most research has focused on conditions on the level of the knowledge-receiving domestic firm (e.g. absorptive capacity) (see e.g. KOKKO 1994), some scholars (see e.g. MARIN and BELL 2006) have also investigated the conditions on the level of the knowledge-originating MNE subsidiary.

- ***How does the presence (and evolution) of MNE subsidiaries in emerging economies such as China and India impact actors in their host environment?***
- ***Which conditions on the level of the subsidiary and the MNE as well as on the level of policy, innovations systems, and individual firm in the host environment mediate this impact? In particular, what is the role of relations and geographic proximity for the spillover of knowledge and technology to domestic firms?***

Chapter six of this dissertation has analyzed the mechanisms and mediating conditions for the external impact of MNE subsidiaries on actors in the host environment. Resembling the findings of prior studies on MNE spillovers in emerging economies (see e.g. GIROUD 2007), the analysis has identified backward linkages to suppliers as the primary spillover channel. Suppliers were shown to benefit from linkages to MNE subsidiaries by upgrading the technological and managerial sophistication and value-add scope of their operations and by reaping scale economies and reputational gains. These effects were the result of both proactive supplier development efforts by the subsidiaries as well as indirect demonstration and motivation effects. Embedded forward or horizontal linkages to domestic firms could

only be observed in few cases and did not appear to have contributed substantially to the spillover of knowledge and technology from the MNE subsidiaries to the host environment. Linkages to non-business actors existed mostly in the area of vocational training, while knowledge-seeking linkages with domestic universities have not been formed by any of the subsidiaries.

Spillovers to unrelated firms and institutions in the host environment were mainly the result of the mobility of labor and demonstration effects within and between industry sectors. Competition between the market-seeking MNE subsidiaries and domestic firms was found to have encouraged upgrading initiatives in particular in those domestic firms with ambitions to compete in the high-end segment of the domestic market. The overall impact of the MNE subsidiaries on the industry structure in the host environments has been moderate. A *crowding out* of firms or a spin-off of new firms from the subsidiaries was not observed.

This dissertation has paid particular attention to mediating conditions for the external impact of MNE subsidiaries. For analytical purposes, it distinguished between the generation of spillover potential by the MNE and the subsidiary and the effective absorption of this potential by the host environment.

On the level of the *MNE HQ*, important mediating conditions identified in the case studies include the investment motive and individual corporate culture.

On the level of the *subsidiary*, mediating conditions include the sophistication of a subsidiary's operations and the willingness and ability of its staff to link to domestic partners.

On the level of *recipient firms and institutions*, different facets of an organization's absorptive capacity proved to mediate the effective use of spillovers. In particular the lack of technical knowledge and industry domain expertise has impeded the capacity of domestic firms to learn in linkages to the MNEs. Moreover, the effective absorption of spillover potential was impeded by a lack of proactive effort and investment of recipient organizations. The interviews suggest that at least some of the external partners have failed to demonstrate sufficient effort to make use the learning potential in their linkages to the MNEs. Geographic proximity was found to reinforce the absorptive capacity of domestic partners by facilitating frequent (face-to-face) meetings and fostering trusted relations. However, geographic proximity was also shown to be insufficient to compensate for a lack of initiative and investment of receiving firms.

As far as spillovers to unrelated firms are concerned, the magnitude and type of spillovers was shown to differ with the degree of (technological) similarity or complementarity of industry sectors. While firms in the same or related industry sectors were at least partially able to make

use of the product- and process-knowledge leaking from the MNE subsidiaries, firms in unrelated industry sectors have benefited rather from the spillover of generic organizational and managerial best practices. The case studies provide tentative evidence that the spillover of such generic best practices has benefited mostly firms in the region, while the spillover of specific product- or process knowledge was less space-sensitive and was absorbed by competitors with the least cognitive distance irrespective of their location in the country.

Finally, *national and regional policy* was shown to influence both the generation of spillover potential by the MNEs (e.g. by offering incentives for the transfer of new technologies) and its effective absorption by domestic firms and institutions (e.g. by strengthening public education or providing incentives for technological upgrading efforts of domestic firms).

7.2 Limitations and areas for future research

This dissertation has explored a broad range of topics in an attempt to enhance transparency of the drivers and mechanisms underlying the evolution and external impact of MNE subsidiaries. Such a broad, exploratory approach comes at the price of several limitations, which will be highlighted in the following.

In line with MEYER et al. (2011), this dissertation has argued that existing theories of the MNE fall short to capture the complexities of the increasingly differentiated MNE-internal and -external environment in a globalizing world and that further conceptual work on the MNE is required. Taking the perspective of the MNE subsidiary, the dissertation has therefore investigated the challenges and opportunities associated with the MNE's *multiple-embeddedness* in differentiated host environments and the complex nature of the MNE's network of competing and cooperating subsidiaries. It has provided in-depth empirical evidence from the MNE subsidiaries in China and India with regard to their interplay with the MNE-internal and -external environment. However, these efforts can only be a first step towards extending the theory of the MNE, and further conceptual and empirical efforts will be required to advance the concepts developed in this dissertation. Interesting avenues for further research inspired by this dissertation could be the strategies of the MNE to respond to the differentiated requirements of emerging economies (e.g. by introducing *emerging market* product mandates or R&D centers) and the role of localized strategic assets in emerging economies (e.g. low-cost design skills) in fostering subsidiary upgrading and the MNE's competitive advantage.

The analysis of the external impact of MNE subsidiaries on the host environment has revealed a complex set of conditions on the level of the knowledge-originating and –receiving firm which mediate the spillover from MNE subsidiaries. However, this analysis has left several questions open. One of these loose ends is the link between the MNE's investment strategy and the occurrence of spillovers. Further research will be required to investigate which characteristics on both levels are required for effective spillovers from market-, efficiency-, resource- and strategic-asset-seeking subsidiaries in the host environment. The link between the MNE's organizational setup and spillovers from its subsidiaries are another promising field for empirical examination.

A range of limitations of this dissertation are related to the applied research design. In order to penetrate the microfoundations of the evolution and external impact of MNE subsidiaries, this dissertation has applied an in-depth, exploratory design. This design has facilitated the analysis of relations and processes in the MNE-internal and -external environment which are often blurred in the literature. However, this design is ill-equipped to allow for a substantial (statistical) generalization of constructs beyond particular host countries and industries (YIN 1999). The case selection of this dissertation was limited to two emerging economies – China and India. The findings of the dissertation are deeply embedded in the specific national and regional context of these countries and can therefore only serve as indications for what might be relevant in other (especially emerging economy) environments. Here lies a particularly interesting avenue for future research: comparative empirical studies should examine the evolution and external impact of MNE subsidiaries in a range of other emerging economies in order to generate a sound empirical basis for policy and management strategies for emerging economy environments. Furthermore, comparative studies on the subsidiaries of an MNE in both emerging- and developed-country settings would be interesting to isolate the emerging-economy-specific aspects of subsidiary evolution and external impact.

The six researched subsidiaries represent two industries, yet they are by no means *representative* for these industries. The dominant role of MNE-specific characteristics (e.g. organizational change) in the case studies prohibits a generalization of the case study findings to the respective industries. However, the findings might still serve as indications for further research with regard to how industry-specific characteristics (e.g. tight versus loose supply chain integration or synthetic versus analytical knowledge generation) might provoke different strategic and organizational responses of the MNE and the subsidiary.

The fact that two German MNEs were selected further reduces the generalizibility of findings. Prior studies have identified the county of origin as a relevant determinant of an MNE's

strategy towards its subsidiaries (see e.g. HARZIG and SORGE 2003, MEYER et al. 2009). For further in-depth studies on MNE subsidiaries, it might be therefore interesting to investigate how the country of origin contributes to subsidiary evolution and external impact.

The case studies provide (tentative) evidence for an influence of the national working cultures in China and India on the evolution paths of MNE subsidiaries in these countries. However, the presence (and pivotal role) of expatriate managers in all three researched Chinese subsidiaries has blurred the influence of national and expatriate culture. In order to assess the influence of culture on subsidiary evolution, further research on MNE subsidiaries should compare MNE subsidiaries with and without strong expatriate communities.

The data collection for this dissertation went beyond that of most prior qualitative approaches to subsidiary evolution by incorporating data from the level of the subsidiary, the MNE HQ, and selected external partners. However, the selection of external partners is biased towards suppliers and is therefore not representative of the subsidiaries' external network. A more comprehensive coverage of the external network could generate additional insights.

And finally, this dissertation has conceptualized subsidiary evolution as an up- or downgrading of manufacturing and R&D functions. The integration of additional functions in further studies could generate a more comprehensive picture of MNE subsidiary evolution.

7.3 Implications

The findings of this dissertation regarding the evolution and external impact of MNE subsidiaries suggest a range of implications for MNE (and subsidiary) management as well as for national and regional policy. Owed to the limitations discussed above, these implications might not qualify as general rules for MNE activity in China and India or even beyond. Yet they can provide important indications for opportunities and challenges to be considered in strategy and policy development – in particular in emerging market environments.

7.3.1 Implications for MNE management

The differentiated knowledge and capabilities of subsidiaries in the MNE-internal network has been widely recognized as a source of the MNEs competitive advantage (GHOSHAL and NOHRIA 1997). But the coexistence of collaborative and competitive behavior in the MNE-internal network might impede an effective distribution of such assets. The case studies demonstrate that the exchange of routine and innovative capabilities between sister subsidiaries is often impeded by competitive behavior and/or a lack of incentives and might

therefore contribute only little to the strengthening of individual subsidiaries. By concentrating all or most knowledge and technology exchange on the HQ-subsidiary dyad, the MNE runs the risk of overstretching the capacities of the center and of underutilizing the potential of its differentiated network. This is particularly relevant for MNEs with multiple subsidiaries in diverse environments. Promising measures to encourage an exchange of knowledge and technologies within the MNE network include the development of appropriate incentive structures for subsidiary-management, the establishment of global knowledge exchange platforms, and the reinforcement of social links in the MNE network (e.g. through temporary assignments in sister subsidiaries).

The case studies resemble findings in prior studies by demonstrating that MNE management faces considerable challenges to coordinate the *multiple-embeddedness* of its network of subsidiaries in diverse host environments – in particular in the face of the dynamic growth in China and India (as well as some other large economies) (MEYER et al. 2011). MNEs in most industry sectors can neither afford to ignore these emerging economies nor to approach them with globally standardized processes and product portfolios. The case studies suggest that the strategy and organization of the MNE must allow for sufficient levels of flexibility to be responsive to national and regional particularities. However, with a strong embeddedness of processes, products, and management in the host environment, the risk is high to impede interaction and knowledge exchange between the subsidiary and the MNE, which might deprive both the subsidiary and the MNE from mutual upgrading impulses. While strong national organizations tend to over-embed into the host environment, a dominant global HQ will often lack the capacity to be responsive to multiple diverse host environments. The empowerment of an additional corporate layer between the national and global level (e.g. an Asia-Pacific HQ) can help to balance the required local embeddedness of subsidiaries and their integration with the MNE. Instead of organizing the MNE along geographic parameters (e.g. NAFTA and Asia-Pacific organizations), the MNE (or specific functions) could also be organized as clusters of markets sharing similar characteristics with regard to their (economic) development stage and growth potential. By establishing formal and informal structures linking the subsidiaries in the geographically dispersed emerging economies with each other, a good balance might be achieved between responsiveness to local requirements and MNE-wide cohesion and efficiency.

Local responsiveness in the sense of lowering the MNE's safety and environmental standards to the levels of the emerging host economy (*when in Rome do as the Romans do*) might promise short-term gains in competition with domestic firms. But such a strategy bears the

risk of reputational damage and adverse reaction of domestic stakeholders. The case studies demonstrate that MNE subsidiaries are closely watched by authorities and domestic competitors, and that different standards and expectation might be applied to foreign and domestic firms despite formal equality. MNEs should therefore manage stakeholder relations very carefully and establish themselves as *good corporate citizens*. The case studies suggest that maintaining above-average standards can be beneficial in the long run by reinforcing relations to authorities and other stakeholders.

Location advantages in emerging economies are not limited to markets, resources, and factor conditions, but might also include strategic assets to augment the MNE's innovative capabilities. Instead of dismissing the existence of learning potential in emerging economies because of the gap of domestic firms to the technological frontier, MNEs should proactively search for strategic assets embedded in *emerging-economy-specific* capabilities (e.g. the skill to design low-cost, functional products). MNE management should generate awareness on both the level of the HQ and the subsidiary to recognize and absorb such strategic assets. A helpful measure to achieve this could be to establish a healthy mix of domestic and expatriate managers in the subsidiary. The case studies revealed that both the subsidiaries with mostly domestic and mostly expatriate leadership were able to improve their capacity to identify and absorb localized assets by increasing diversity in their management team.

Emerging-economy-specific strategic assets are often embedded in domestic firms and institutions. This emphasizes the need to go beyond a mere *monitoring* of the host environment towards forming interactive *linkages* with external partners. The observation that such regional linkages have played only a marginal role for subsidiary evolution in the case studies suggests considerable leeway in making effective use of strategic assets in the host environment.

MNE and subsidiary management should not confine themselves to exploit the resources and strategic assets readily available in the host environment. Proactive efforts to upgrade the surrounding (business) environment might be required to unlock hidden potential. In backward linkages to domestic suppliers, MNEs should not wait for suppliers to upgrade automatically by merely challenging them with competitive biddings and high requirements, but rather engage in selective upgrading efforts to narrow the technology and capability gap and to make best use of the supplier's localized advantages. Such proactive development demands bold and often long-term efforts including sufficient financial resources, capable engineers, and top management attention. Frequent (face-to-face) interaction in geographic proximity to domestic suppliers can facilitate the supplier development process, while the

development of more distant suppliers is likely to cause higher cost for comparable outcomes. MNE and subsidiary management should consider these efforts in their *total cost of ownership* of localized supply when designing supply strategies in emerging economies. Cost savings might be less attractive as soon as the costs for supplier development (as well as continuous supervision and quality assurance) are included.

The often insufficient qualification of human capital in emerging economies does also demand proactive measures from MNE and subsidiary management. While extensive in-house training should be a given, MNEs should also look into opportunities to join forces with public and private actors in the host environment to achieve a sustainable improvement in the education sector. An alternative strategy could be to adjust the subsidiary's processes and job profiles to the skill profiles available in the labor market. While this strategy may facilitate recruiting, it runs the risk of reducing the compatibility of a subsidiary's equipment, know-how, and (possibly) quality with the rest of the MNE.

A certain leakage of knowledge and technology from emerging economy subsidiaries will be unavoidable in most cases. MNE and subsidiary management should proactively manage these unintended spillovers by defining which knowledge is proprietary and therefore requires protective measures, and which knowledge is already available in the host environment anyway. Mobility of labor is a primary avenue for the dissemination of knowledge to firms in the host environment. The retention of qualified staff should therefore be given highest priority. Besides impeding unintended spillovers, the retention of qualified staff supports the accumulation of capabilities in the subsidiary and reduces barriers to knowledge exchange on the HQ level, which is crucial for the successful upgrading of the subsidiary over time. Additional safeguard measures, such as distributing strategic knowledge among several employees, can further reduce unintended spillovers. Seamless patenting protection should be a given for technology-intensive operations in emerging economies.

7.3.2 Implications for national and regional policy

The findings of this dissertation offer a range of important implications for policy makers on the national and regional level in China and India (and in emerging economies in general).

First of all, the findings demonstrate that the role of MNE subsidiaries in national and regional innovations systems cannot be assessed by merely focusing on the subsidiary as an independent actor. Subsidiaries are embedded in a complex MNE network which influences the evolution of their operations and their impact on the host environment. Subsidiaries with

weak MNE-internal bargaining power might be unable to take advantage of investment incentives in the host environment. And subsidiaries embedded in a network of sister subsidiaries in neighboring countries might offer access to extra-territorial knowledge, but might be less sensitive to pressure from authorities in either location given their ability to shift operations between different locations. The complexity of the MNE network also entails that national and regional configurations and policy might provoke reactions of actors on different organizational or geographic levels of the MNE. While some aspects are mainly recognized on the level of the subsidiary (e.g. infrastructure and regional cluster dynamics), other aspects (e.g. IP and trade regimes) are also recognized by the MNE's global business units and the corporate HQ. Recognizing the strategic priorities of these different actors can help policy makers to improve the effectiveness of their investment promotion and economic policy.

For policy aimed at attracting investment to a particular host country or region, the findings suggest that policy makers should focus less on growing the overall volume of FDI and more on targeting the *right* type of FDI for their particular environment. The findings demonstrate that the contribution of MNE subsidiaries to the upgrading of the host environment is – among other factors – influenced by industry characteristics. The case studies suggest that compared to FDI in the lighting industry, FDI in automotive might be associated with greater propensity of subsidiaries to link to domestic firms and with more follow-up investment of (foreign and domestic) competing and related firms. This is mainly related to the requirement for geographic proximity of supply chain partners and the interactive character of value creation and innovation in automotive. Given that domestic firms in emerging economies are often heavily dependent on linkages to MNEs as gateways to extra-territorial knowledge and markets, policy makers should be consider such implications related to industry characteristics in their investment promotion and economic upgrading programs.

The contribution of MNE subsidiaries to the host environment is also influenced by the fit of the investment motive and the capabilities and requirements of the host environment. The case studies demonstrate that both market- and export-seeking FDI can potentially generate positive spillovers. While market-seeking subsidiaries might be more motivated to form linkages to domestic suppliers and customers and might thereby facilitate spillovers on the firm level, export-seeking subsidiaries adhering to global technology and quality standards might offer greater overall learning potential. However, if the technology gap between domestic firms and the MNE is too large, export-oriented units might end up operating in isolated enclaves and spillovers might be impeded. National and regional policy makers

should therefore consider carefully for which type of FDI their country or region can offer a fertile environment to induce spillovers.

For policy aimed at MNE subsidiaries, the case studies offer indication for how effective spillovers to domestic firms and institutions might be facilitated. First and foremost, the findings suggest that the sophistication of a subsidiary's operations can induce a co-evolution of domestic partners and competitors. The upgrading of MNE subsidiaries should therefore be given priority by national and regional policy makers. Such an upgrading of MNE subsidiaries is – among other factors – facilitated by the availability of public goods (in particular human capital and infrastructure) and strong supplier markets. Authorities in emerging economies must pay particular attention to enhancing human capital, as the lack of sufficiently qualified talent can slow down the upgrading of MNE subsidiaries. MNE subsidiaries might proactively try to mitigate such shortcomings, for example by engaging in internal and external vocational training initiatives. Regional authorities should support such approaches to foster the upgrading of existing subsidiaries as well as to attract additional investment into the region.

The insufficient protection of IP is another major barrier to subsidiary upgrading. Despite improvements in the formal IP regime in China and India, a considerable degree of mistrust against the enforcement of these regulations is still prevalent in developed-country MNEs. Establishing confidence in IP protection not only in high-level cases, but also in day-to-day business, should therefore be given high priority by authorities in emerging economies.

Moreover, policy makers must pay close attention to reputational damage caused by labor unrest in MNE subsidiaries. The case studies demonstrate that interruptions of business operations related to labor unrest can drastically deteriorate confidence in the MNE HQ to invest in the affected subsidiary as well as in other units in the host country. Other MNEs might follow suit and reconsider their investment. Regional authorities should therefore attempt to prevent an interruption of MNE business operations, for example by initiating multi-stakeholder dialogues in the affected subsidiaries.

The case studies demonstrate that an effective spillover from sophisticated subsidiary operations often requires embedded linkages between subsidiaries and domestic partners. The challenge for policy is therefore not only to induce subsidiaries to upgrade their operations, but also to ensure that linkages to the host environment will be formed. Policy measures such as import duties and local-content requirements may foster the formation of linkages by enforcing the localization of manufacturing or sourcing, but not necessarily the effective

spillover of knowledge and technology. If it is not deemed cost-efficient to *be there* in the first place, MNE and subsidiary management will likely restrict their commitment to minimum requirements, and positive spillovers from such operations might be limited. The case studies suggest that the availability of strong external partners in the host country (and preferably in the respective region) stimulates linkage formation and proactive transfers of knowledge and technology. Efforts of national and regional authorities to strengthen domestic supplier industries (e.g. in the form of sectoral upgrading programs) might therefore be a promising way to encourage MNEs to link to external partners and thereby to contribute to the upgrading of the host environment.

Besides such policy considerations aimed at the MNE as the knowledge-originating organization, the case studies suggest that the effective spillover of knowledge and technology from MNE subsidiaries requires sufficient absorptive capacity in recipient organizations. The examination of selected suppliers in China and India illustrates that their lack of experience and (technical) domain expertise has impeded the effective absorption of spillover potential and their upgrading in the MNEs' value chains. This demonstrates the need for bold efforts to strengthen human capital in domestic firms and in the regional labor market. National and regional authorities might have to step in even more decidedly to foster public vocational training as well as in-house vocational training in domestic firms.

The case studies suggest that the ability of recipient organizations to effectively absorb spillovers goes beyond (technical) capabilities and might require proactive efforts and investment. Among other factors, the motivation of domestic firms to undertake efforts which would allow them to absorb spillovers is related to competitive and regulatory pressure in the domestic market. By fostering competition between domestic firms and MNE subsidiaries (e.g. by reducing tariffs or regulations discriminating against foreign-owned ventures), policy makers might stimulate upgrading dynamics of domestic firms. Likewise the tightening of quality, safety, environmental, and social standards might foster upgrading dynamics of domestic firms. The case studies (in particular in India) suggest that low standards and/or strong protection from foreign competition (e.g. import duties) can create complacency among domestic firms (and also among MNE subsidiaries in such locations). The tightening of such standards to increase pressure on domestic firms, however, must be accompanied by appropriate initiatives to support the *catching up* of weaker domestic firms in order to ensure a broad and sustainable technological upgrading of the host environment.

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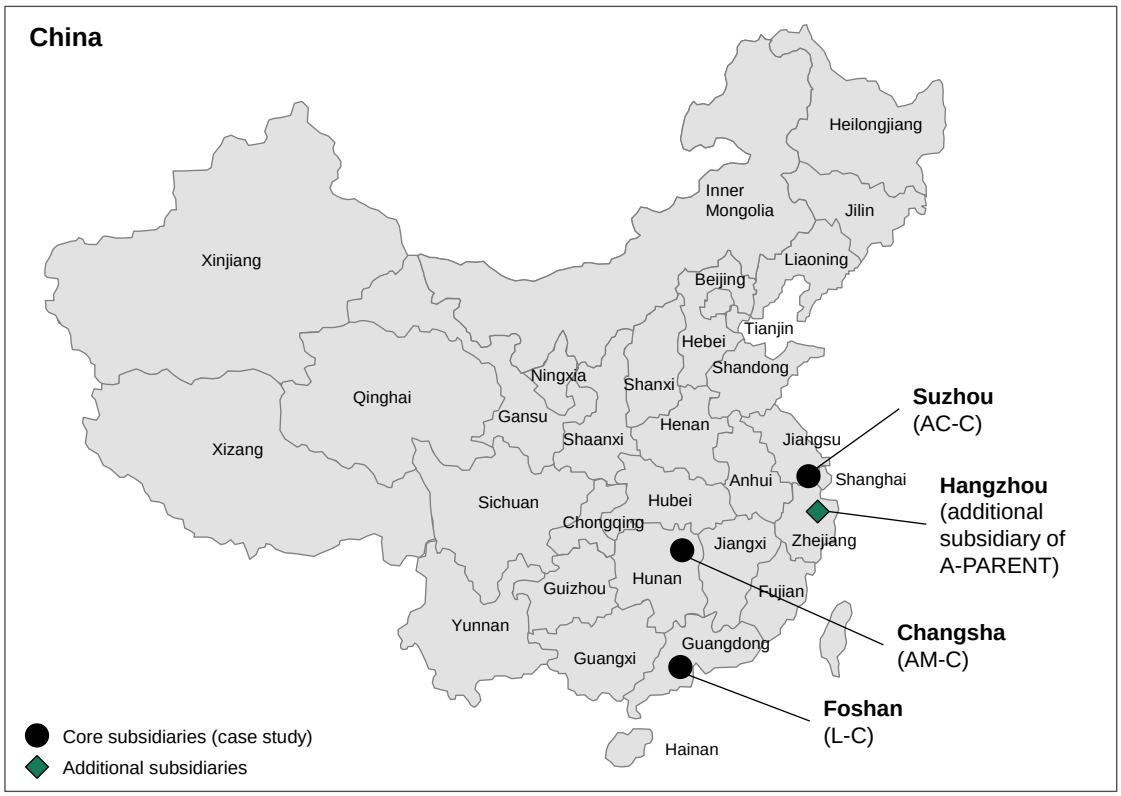
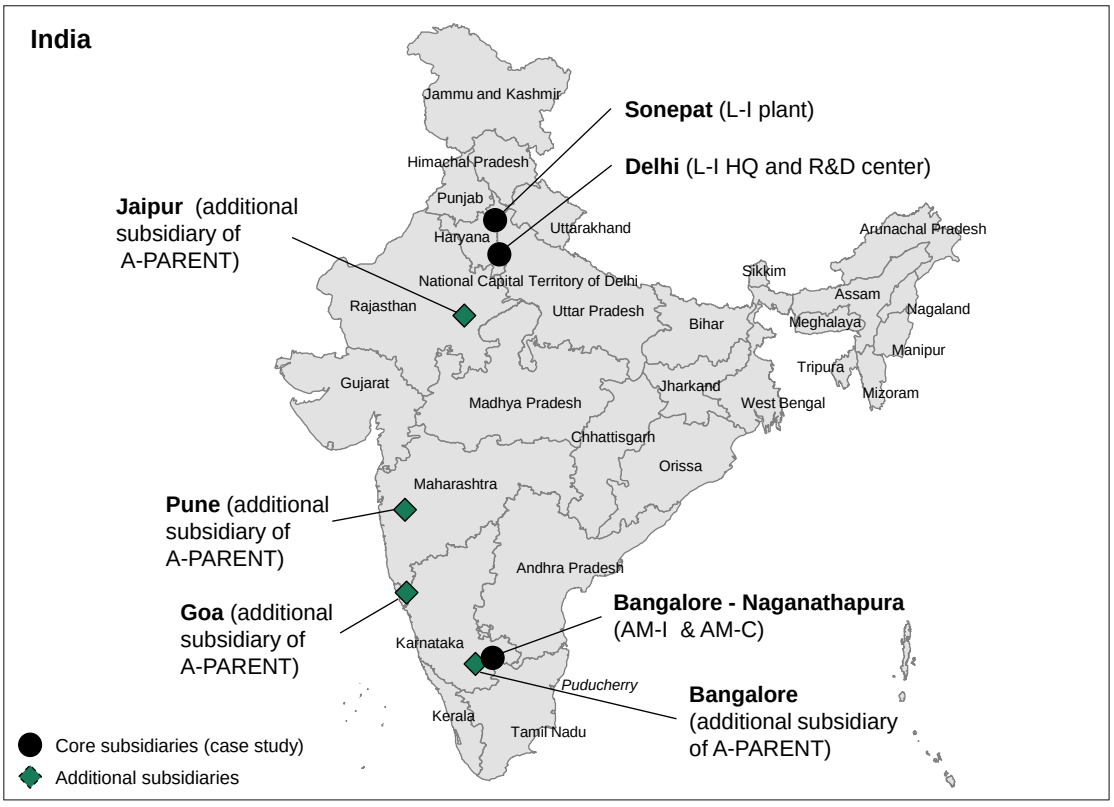
Appendix

Appendix A: Locations of the selected subsidiaries in China and India





Appendix B: Original-language quotes from the case studies

Quotes in chapter 3

Unit	Title	German language quotes (original)	English language quotes (translation)
AC-C	Director R&D (E)	*Muss man auch ein bisschen Netzwerk haben. Wenn sie die Leute nicht kennen [...] dann bekommen sie die Projekte nicht. Das hier ist so ein bisschen eine Koordinationsfunktion [mit dem HQ]. [...] Da geht es eigentlich gar nicht um die Technik oder das Kommerzielle. Da muss man manchmal den Leuten das Gefühl geben, dass sie jetzt nichts Unlauteres machen wenn sie Wissen transferieren oder chinesischen Kollegen helfen.*	*You need to have a network. If the people [...] do not know you, you will not get the projects. Coordination and interaction [with the HQ] is important in this job. […] This is not mainly about technical or commercial issues. Sometimes you just have to give people the feeling that it is ok to transfer knowledge or support the Chinese colleagues.*
		Der Bereich war vorher von einem deutschen Abteilungsleiter geleitet. Als der gegangen ist, ist aus dem Bereich die Schnittstelle nach Deutschland verschwunden. Da hat es schon eine deutliche Verschiebung der Kooperation [mit dem HQ] gegeben.	*This department was run by a German manager before. When he left, the interface of this department to Germany disappeared. This has caused a significant shift in cooperation and interaction [with the HQ].*
	General Manager	*[In der BU] tauschen uns transparent über unserer Kostenstruktur aus. D.h. da haben sie ständig den Druck irgendwo einen gewissen Prozentsatz Kosten rauszunehmen.*	*[In the business unit] we exchange information about our cost structure. That means you are constantly under pressure to reduce cost.*
	Vice President MFG (E)	*Von der ersten Garde sind alle Ingenieure hierher geschickt worden. Über alle Bereiche hinweg hat man bestimmt 100 Leute geschickt. Wir haben auch Fertigungsarbeiter geholt die an den hier aufgebauten Linien angelernt wurden.*	*All engineers from the first batch were sent to the HQ, at least 100 people from all departments. We also brought some workers to train them on the manufacturing lines set up in the HQ.*
		Das wird alles von dieser zentralen Organisation unterstützt. [...] Es hat sehr geholfen dass wir aus den Fehlern gelernt haben die andere gemacht haben, und Dinge die die gut gemacht haben und diese dann noch besser gemacht haben. Das war ein Schlüssel zum Erfolg hier so schnell Produkte herzubringen	*The department supported us with guidelines. We learned from mistakes and best practices of other projects, and we have further improved the best practices. This was a key success factor to localize our products.*
		Wir haben 'Centers of Competence' - das ist eines der Schlüsselthemen. [...] Da versuchen wir weltweit die Prozesse zu verbessern und weiterzuentwickeln. Aber auch neue Prozesse für neue Produkten zu verstehen und sauber einzuführen, so dass die eben mit null Fehler laufen.	*We have centers of competence - that is one of the key topics. [...] Here we analyze and improve manufacturing processes. We also learn how to implement processes for new products to run zero-error processes.*
	Vice President MFG (E)	*Es gibt natürlich Restriktionen in dem Sinne dass es Zukunftsprozesse gibt die man nicht mit uns teilen möchte, weil man Sorge hat dass die nach draußen getragen werden. Wir müssen uns […] immer wieder vor Augen halten dass das Thema IP anders verstanden wird in Asien - und speziell in China - als in Europa. Bei Prozessen die allgemein gekannt sind gibt es einen offenen Austausch in beide Richtungen. Aber Prozesse die eine Innovation darstellen werden nicht offen gehandhabt.*	*There are restrictions in the sense that innovative processes are not shared with us due to concerns that they might leak to the outside. We must always keep in mind [...] that Asia - and in particular China - has a different attitude towards IP than Europe. Therefore we have open exchange of processes known to the market. But whatever is an innovation is often not shared with us.*
		Ich kann nur bedingt aus dem HQ Dinge übernehmen, weil die einfach hier nicht in die Kultur reinpassen. Und auch nicht ins Arbeitsumfeld reinpassen Wie vorhin erwähnt wir machen viel manuell. In Europa machen wir viel mit Maschinen. Aber die Leute in den anderen Ländern hier bereit zu lernen und zu 'benchmarken'. [...] Ich finde da oft gute Ideen. Und dann schicke ich 2-3 Leute die sich das anschauen und mir einen Vorschlag machen wie wir das hier umsetzen.	*The potential to adopt best practices from the HQ is limited, because it does often not fit to the culture and work environment here. We have manual processes, and in Europe they work mostly with machines. [...] People in other countries around here are willing to benchmark. [...] If I find good ideas there, I send two to three people to make a proposal how to implement it here.*
		Wenn ich was Gutes finde dann schicke ich meine Truppen. [...] Wir haben jetzt z.B. ein Projekt mit Portugal wo die was besonders gut machen und ich möchte das hier auch haben. Und da habe ich vier oder fünf Leute hingeschickt für einen längeren Zeitraum und jetzt haben wir hier ein Projekt aufgesetzt und umgesetzt.	*Every time I find something interesting [in A-PARENT] I will send my troops. [...] Currently we have a project with Portugal in an area they are particularly good at. I sent four to five people there over a longer time period to learn from them, and now we have just implemented the project here.*
	Vice President MFG (S)	*Da hat man nicht nur die Managementstellen mit Expats besetzt, sondern wirklich bis runter. Wir haben sogar Techniker importiert aus dem Leitwerk.*	*Expats did not only take on manager positions but also positions at lower levels. Even technicians were imported from the Lead Plant.*
		Ich war davor Abteilungsleiter im Leitwerk. […] Ich kann dort Kollegen und Freunde anrufen und sagen: wir fahren was hoch, helft mir! […] Denn selbst wenn der Präsident mir ein Mandat gibt können die immer noch 50.000 Gründe finden mir trotzdem nicht zu helfen.	*I have worked as department head in the Lead Plant. So I can call colleagues and friends and ask them for help. [...] Because even if the president gives me a mandate, they could find 5000 reasons not to help me.*
		Es ist schon so das gewissen Ängste gegenüber China gibt. Wenn sie sich mal dieses Wachstum anschauen und die Rolle die China heute in der Welt spielt, nicht nur im Automobil- sonder auch politisch oder global gesehen, dürfen sie sich das wirklich nicht so vorstellen dass sie da in offene Türen rennen wenn sie da als China wachsen wie verrückt und riesen Pläne haben.	*There are many concerns [in the HQ] about China. When you take a look at this rapid growth and China's role in the world - not only in automotive but also politically - then you should not expect all others in the organization to be enthusiastic about your growth and future expansion plans.*

		Es ist schon so das gewissen Ängste gegenüber China gibt. [...] Was sie sie halt in einem solchen Fall brauchen ist das Backup vom Präsidenten - also wirklich dem Gesamtchef. Und der sagte immer 'shift to Asia' oder 'go to China'. [...] Wenn wir diesen Executive Support nicht gehabt hätten wäre es sicherlich sehr viel schwieriger gewesen.	*There are many concerns [in the HQ] about China. [...] What you need in such a situation is the support from the group president. And he always used to say 'shift to Asia' or 'go to China'. [...]Without this support it would have been even more difficult.*
		Unterstützung [von anderen Einheiten in China] haben wir eigentlich nicht, weil wir eben ein vertikales Business sind. Und es sind doch auch sehr spezielle Produkte. [...] Die Elektronik Fertigung [...] ist von den Kompetenzen, vom Detailknowhow her einfach was anderes als eine Hydraulikfertigung und Mechanikfertigung. Daher haben wir den ganzen Ramp-Up schon sehr stark in der [globalen BU] realisiert.	*We get only very limited support from [other units in China], because we are a vertical business. And the products are very different. [...] The electronics manufacturing [...] differs significantly from hydraulic and mechanical manufacturing in terms of competences and know-how. Therefore the entire ramp-up here was managed by the [global BU].*
AM-C	Director Engineering	*Ich kann nicht sagen, dass ich viel schneller gewesen wäre wenn der und der nicht blockiert hätten. [...] Ich kann mir aber vorstellen dass da viel Überzeugungsarbeit geleistet werden musste. Aber die haben wir geleistet.*	*I do not want to claim that I could have been much faster if others had not impeded my efforts. But it took a lot of convincing.*
AM-I	Director Marketing	*Der Kampf innerhalb der [A-PARENT Indien] um die Ressourcen, das gab es früher in der Form nicht. Also zwischen den BUs. Jetzt bekommt man seine Ziele aus Deutschland. [...] Und das ist doch klar. Wo Ziele herkommen, woran ich gemessen werde, auf diese Themen fokussiere ich mich. Und das gab es früher in dieser Form nicht. [...] Da gab es schon die einzelnen Geschäftsfelder, aber die wurden zentral in Indien gesteuert. [...] Man versucht jetzt mehr den globalen Austausch. Wir lernen von Problemen die die Chinesen oder die Brasilianer haben. Das gab es früher nicht so intensiv.*	*Before [the re-organization] we did not have this struggle for resources between the different BUs in [A-PARENT India]. But now the targets are set in Germany, and the people follow the global strategy. Before, all business areas had been managed from a central point in India. Now the focus is more on global exchange, on learning from the problems of the Chinese or the Brazilians.*
A-PAR. HQ	Director Engineering	*Wenn es darum geht mit den Kosten runterzukommen, unkonventionelle Lösungen zu suchen, dann brauche ich Länder wie Indien. Die können unwahrscheinlich gut improvisieren. Das ist Teil ihrer Kultur, und das muss man nutzen. Hätte ich das den Brasilianern gegeben wäre es technisch komplexer ausgefallen, aber nie so kostengünstig.*	*To reduce cost and develop unconventional solutions, I need countries like India. They are great at improvising, that's part of their culture. Had I assigned the project to Brazil, the solution would have been more sophisticated but less cost efficient.*
		Indien war bis vor kurzem von der Kompetenz her noch vor China. [...] Aber Indien hat den Nachteil, dass der Einkaufsmarkt geringer ist. [...] Und das war letztendlich das Zünglein an der Wage, dass wir gesagt haben: Wir probieren es in China.	*Until recently India was ahead of China in terms of competence. [...] But India's disadvantage is its small supplier base. This was the reason why we decided to move forward with China.*
L-PAR. HQ	Manager Quality (P)	*Man hat ja dieses Werk [Foshan] neu gebaut, und da ist es relativ leicht [moderne Prozesse] gleich zu implementieren. Es ist schwieriger was umzubauen wenn sie ein bestehendes Werk haben, die alten Gewohnheiten da raus zu kriegen.*	*This [L-C] is a new plant. This facilitates the implementation of new processes. It is more difficult to implement changes to processes and habits in an established plant.*
	Manager R&D EU	*Die [L-I] haben sich immer nach Deutschland gewendet um technische Probleme zu lösen. [...] Die waren immer sehr problemlöse-orientiert, [...] aber nicht daran orientiert die Infrastruktur im Land aufzubauen, um die Lösung vor Ort zu machen. Denn dann hätten sie erst einmal investieren müssen.*	*For technical problems they [L-I] always asked Germany for help. They were focused on getting problems fixed, but not on developing the infrastructure to fix them alone. This would have required investment.*
		Lange mussten technische Änderungen in D. noch mal gegengezeichnet werden. [...] Das kostet Zeit und ist frustrierend. Das kann man dann natürlich auch nutzen um Leute auszubremsen. Denn wenn sie ein Produkt aus China qualifizieren wollen, oder ein Vorerzeugnis, dann finden die [HQ] immer etwas was nicht normgerecht ist. Weil u.a. die Werknorm auf das Produkt oder Vorerzeugnis aus Europa geschnitten war	*Technical adjustments always require confirmation. [...] This takes time and can be frustrating. And it can of course also be used to slow down others. If you want to qualify a product or material from China, they [the HQ] will always find a violation of the product norm, which was written for products or materials in Europe.*
	Vice President (C)	*Ich kann jetzt nicht sagen, dass was aus dem Werk geworden ist Produkt der chinesischen Mentalität ist. Da waren halt deutsche Manager die das in anderen Teilen der Welt auch schon gemacht haben. Und die haben das sehr systematisch und auch mit hohem Personaleinsatz gemacht.*	*I would not say that the success of this plant was owed to Chinese culture. It was driven by German managers with experience in other parts of the world. They were driving it systematically with high deployment.*
		Die Expat-Gemeinde in Foshan war immer sehr groß. Da waren halt deutsche Manager die das in anderen Teilen der Welt auch schon gemacht haben. […] Und da ist dann halt auch was dabei rausgekommen.	*The expat community in Foshan was substantial. There were always German managers with experience from around the world. And therefore the plant has developed successfully.*
		In China hat man den Aufwand betrieben, also kommt auch was dabei raus. Darum kommen die als Lieferant für die Welt in Frage. In Indien stimmt vieles nicht. Darum kann man das nur für den lokalen Markt brauchen. Also bekommen sie weniger Aufmerksamkeit, und es kommt noch weniger raus.	*Due to considerable efforts invested [by L-PARENT], China has developed successfully. So they can be used as global suppliers. In India, many things go wrong, and their output only be used for the domestic market. In turn they received even less attention and lag even further behind.*
		Wir könnten den indischen Markt lässig aus unseren chinesischen Fabriken bedienen, wenn nicht die Importzölle wären. Wenn wir die Importzölle nicht hätten, hätten wir sehr wenig Druck darauf da eine Fertigung zu machen.	*Without import duties, we could easily serve the Indian market from China. There would be no pressure to have a plant there.*

	Vice President (P)	*Für China gab es einen extrem hohen Aufmerksamkeitsgrad aus Europa. Wesentlich mehr als nach Indien. So dass also die Einflussnahme von [L-PARENT] sehr stark war. Und man sehr schnell und intensiv dort Veränderungen vorangetrieben hat.*	*China has received high levels of attention from Europe. Much more than India. The influence from [L-PARENT] was therefore very strong, and bold changes were implemented quickly.*
		Wenn ich zwar hinfahre und sage: Das und das ist jetzt ganz schlecht - dann wird auch was gemacht. Aber es ist kein wirkliches Verständnis für eine dauerhafte Veränderung. Es ist nur punktuell. [...] Aber es ist nicht die Dynamik drin die wir eigentlich bräuchten.	*If I go there and tell them something has to change, then it gets done. But what is missing is a sense for sustainable improvement. It's only ad-hoc activities. [...] We would need very different dynamics there.*
L-C	Head of Development (P)	*[Aktuell gibt es Lücken] bei einigen Topprodukten im Automotive Bereich und im Hochdruckentladungsbereich. [...] Das sind Entscheidungen für die Zukunft. 'Footprint' Entscheidungen, wo man sagt wann will man damit hier anfangen. [...] Ich glaube ein ganz klares Hinderniss sind Arbeitsplätze in Deutschland oder wo auch immer - in den Hochlohnländern. Denn solche 'Footprint'-Entscheidungen [...] sind in der Regel nicht umkehrbar.*	*[We still have gaps] in some high end automotive and high-pressure-discharge technologies. [...] These are the footprint decisions for the future. [...] I think jobs in Germany or other high-wage countries are a clear obstacle, because such footprint decisions are final [...] and will not be reversed.*
		Es gibt eine Matrixorganisation in [L-PARENT]. Ich bin Teil der BU die in Hong Kong sitzt, aber hier stationiert. Und ich bin gleichzeitig Teil der weltweiten R&D Community. [...] Hong Kong durchaus eine wichtige Rolle, was Strategie von Foshan. Die machen Produktportfolio, setzten die Preise fest, die Ressourcenplanung, etc.	*[L-PARENT] has a matrix organization. I am part of BU in Hong Kong, and at the same time part of the global R&D community. [...] Hong Kong plays an important role for the strategy of Foshan. They decide on the product portfolio, pricing, resource planning, etc.*
	Vice President Technical	*Da werde ich nicht gefragt ob ich will oder nicht will. Wenn die BU sagt: ja, das hat einen vernünftigen Outlook, das machen wir, dann machen wir das*	*They [the global BU] will not ask whether or not I want to do it. If the BU thinks it is economical, then we have to do it.*
		Ich habe natürlich jemand in Deutschland der auf uns schaut. [...] Wenn ich investieren will muss ich einen Investitionsantrag einreichen. [...] Aber dass da massiv gebremst wurden ist mir nicht bekannt.	*Of course there is someone in Germany watching us. [...] But I am not aware that we have been slowed down substantially.*
		Natürlich hatte das [der Wettbewerb] eine motivierende Wirkung. Weil die Kollegen hier denken sie sind der Weltmeister. Und dann sagt man: es gibt eine andere Fabrik, die kann es aber viel billiger machen als ihr. Das geht natürlich schon an das Ehrgefühl.	*This [internal competition] is motivating us. Some of the colleagues here think they are world champions. And then you tell them: there is another factory that can produce even cheaper. That's a challenge.*
L-I	Project Manager Technical	*Foshan Werk ist ein modernes Werk, das neu gebaut wurde. […] In einem 'greenfield' Projekt bin ich immer besser als wenn ich mit einer alten, gewachsenen Fabrik arbeiten muss. Die alten Strukturen sind ein Mehraufwand. Ich habe mehr Transportarbeit, mehr Handling-Arbeiten in der Fabrik.*	*Foshan [L-C] is an entirely new plant. In a greenfield project the performance is always better than in an old plant. The old structure causes extra work. There is more time and effort required for transportation, handling, etc.*
		Die Kommunikation [mit dem HQ] ist jetzt viel stärker. Früher hatte man auch nicht so viel Kontakt zu China. Früher war Indien für sich alleine, man hat da so rumgearbeitet und rumexperimentiert. [...] Dadurch dass man jetzt die Kopplung mit der BU und mit China hat werden viel mehr Technologien und Informationen ausgetauscht.	*Communication [with the HQ] has intensified. There was also limited interaction with China before. India was operating more or less on its own. [...] But now with the link to the BU and China, more technology and information gets exchanged.*
		[In Asien ist] alles in Chinesischer Hand. [...] Und Indonesien auch. [L-PARENT] hat dort einen eigenen Fertigungsstandort. Und in Japan übrigends auch. Man hat das bereits alles erschlossen.	*The Asian market is controlled by China. […] And also by Indonesia and Japan where [L-PARENT] operates manufacturing sites. This market has already been developed.*

Quotes in chapter 4

Unit	Title	German language quotes (original)	English language quotes (translation)
AC-C	Director Finance	*In Europa sind wir einfach gewohnt dass wir Logistikpartner haben die perfekt funktionieren. Zuverlässigkeit, Geschwindigkeit, Qualität. Das existiert zu Zeit in China nicht. D.h. da bekommen sie immer schlechte Überraschungen. Man kann sagen: ok, das hat uns blockiert.*	*In Europe we are used to highly efficient logistics providers: Reliability, speed, quality. And this does currently not exist in China. You always get surprises. I could argue that this has slowed us down.*
		Die sind sehr kundenorientiert. Das ist das erste Mal dass ich Beamten gesehen habe die sagen: was können wir tun um ihre Aktivitäten zu erleichtern? Z.B. wenn wir längere Öffnungszeiten brauchen weil wir Tag- und Nacht importieren.	*They are customer-oriented. This is the first time I have public servants asking me what they can do to facilitate my activities. For example when we need longer service hours for importing day and night.*

		Es ist der Regierung - ob jetzt Zentralregierung oder lokale Regierung im SIP - ziemlich klar dass Ostchina kurz-/mittelfristig kein Billiglohnstandort mehr sein wird. […] Und dann ist die Frage: was wird es hier geben? Wie bekomme ich mehr Wertschöpfung rein? [...] Die Strategie der Regierung ist eine Mischung aus Zwang und Incentive. Es gibt Steuervorteile wie 'High-Tech Status', was jetzt mehr und mehr von der Regierung gepusht wird. Wenn sie diesen Status erreichen bekommen sie weitere Steuerreduzierungen. 'High-Tech Status' bedeutet dass sie nachweisen können dass sie eine High-Tech Firma sind, und dazu gehört auch dass sie lokal entwickeln und Intellectual Property und Patente lokalisieren.	*The central and local governments are aware that Eastern China will not continue as a low-cost location. [...] So the question is how to increase the value-add in the region. [...] The strategy of the government is a mix of force and incentives. There are tax incentives like high-tech status now pushed by the government. If you reach this status, you get additional tax incentives. You reach the status by proving that you are a high-tech firm with localized development, patents and IP.*
	Vice President MFG (E)	*Wir haben im direkten Bereich [Arbeiter] ungefähr die Fluktuation von draußen. Ungefähr 20 Prozent. [...] Aber das kann ersetzt werden weil wir hier entsprechend nach Standards arbeiten. Das tut mir nicht weh.*	*Among direct staff [workers] we have the same fluctuation as the environment - about 20 percent. [...] But this can be compensated because we follow standardized procedures. This does not harm us.*
	Vice President MFG (S)	*Ich möchte 'ship-to-line' Konditionen haben. D.h. ich möchte einen Lieferanten haben der mindestens einmal am Tag kommt. Im besten Fall drei mal am Tag. Und ich sagen meinen Einkäufern oder auch meinem Logistikteam ich möchte Lieferanten haben die im Umkreis von 50 Kilometer sitzen. [...] Das schaffen sie nicht immer. Wir schaffen es aber bei vielen, oder den meisten großen Teilen.*	*I want to have 'ship-to-line' conditions. That means my suppliers should deliver at least once a day - better three times a day. And I tell my purchasing and logistics team to choose suppliers within a 50 kilometer radius. [...] This is Lean Management. The suppliers have to be close to the plant.*
AM-C	Director Engineering	*Der indische Markt ist sehr klein. [...] Unser Markt dagegen ist groß, also können wir uns eine große Entwicklungsabteilung leisten bzw. müssen uns eine leisten. [...] Das sind die Hauptgründe: Wir wachsen schnell und sind groß, also wir mussten das hier aufbauen.*	*The Indian market is very small. [...] Our market, in contrast, is very large. Therefore we can or must afford a large R&D department. [...] This was the main reason to establish it [the new R&D center] here.*
		Die [Hydraulik-Einheit] muss hier in China viel weniger können - also nur die Basis-Funktionen werden hier verlangt. [...] Während in Europa so viele Komfort-Funktionen eingebaut wurden in dieses Aggregat dass die technischen Anforderungen an die Pumpe völlig anderen sind. [...] Und das was wir lernen hier jetzt ist dass man in D. eine Tendenz hat die Funktion immer mehr auszubauen, die Funktionen und die Features der Produkte. Während hier man sagt: wir brauchen [Hydraulik] und Schluss. [...] Und wir können dramatische Kostensenkungen erreichen dadurch. Also das ist eine andere Philosophie	*In China, the [hydraulics] products can have fewer functions. The basic functions are sufficient. [...] In Europe many comfort functions are included, and this changes the requirements for the electrical drive. [...] What we can learn here is that in Germany we have the tendency to over-engineer the functions and features. Here they say we want [hydraulics] and nothing else. This way we can achieve drastic cost savings. It is a different philosophy.*
		Der Arbeitsmarkt in Changsha ist nicht vergleichbar mit Shanghai. Alle Kunden, Zulieferer, Wettbewerber, ich würde sagen 60 Prozent der Automotive Welt sitzt in Shanghai und der Gegend.	*The labor market in Changsha cannot be compared with Shanghai. All customers, suppliers and competitors – I would say 60 percent of the automotive world – are located in and around Shanghai.*
		Da wir nicht schnell genug vorangekommen sind mit Personalaufbau in Changsha haben wir 2009 beschlossen eine zweite Abteilung aufzubauen die sich überwiegend auf neue Produkte fokussieren soll. [...] Sehr stark mit Fokus auf Kosten-Reduzierung. Und diese Abteilung sitzt in Shanghai. Die haben eine über 50 Mann starke Abteilung. Die besteht im Wesentlichen aus Ingenieuren, die Produkte entwickeln. [...] Aber auch Einkaufs-Kollegen sitzen dort, so dass sie in der Lage sind 'Simultanous Engineering' mit Lieferanten zu machen.	*We could not meet our recruiting targets in Changsha. So we decided in 2009 to set up a second department for product development and cost reduction. [...] It is located in Shanghai. It employs more than 50 people, mostly engineers but also purchasers for simultaneous engineering with suppliers.*
	General Manager	*Wir haben ein ausgezeichnetes Verhältnis zur Regierung. Dadurch dass wir einer der größten Steuerzahler sind, sind wir bevorzugte Industrie. Wir hatten nie Probleme.*	*We maintain excellent relations to the government. We are one of the largest tax payers. We are preferred industry. And therefore we never had any problems*.
A-PAR. HQ	Director Engineering	*Wenn es darum geht mit den Kosten runterzukommen, unkonventionelle Lösungen zu suchen, dann brauche ich Länder wie Indien. Die können unwahrscheinlich gut improvisieren. Das ist Teil ihrer Kultur, und das muss man nutzen.*	*To reduce cost and develop unconventional solutions, I need countries like India. They are great at improvising, that's part of their culture.*
		Wir haben uns entschieden, dass das wichtige zweite Standbein, die Plattformentwicklung, in China sein wird. China ist der größte Markt, mit Abstand. Indien mit seinen vier bis fünf Millionen Fahrzeugen ist klein im Vergleich zu China.	*We decided to create our second hub for platform development in China. China has by far the largest market. With its four to five million vehicles India is small in comparison.*
L-PAR. HQ	Manager Global Quality	*Die Chinesen sind sehr gut darin Dinge zu kopieren und dann in vergleichbarer oder besserer Qualität deutlich günstiger zu liefern. [...] Aber ich habe nie den Eindruck gehabt, dass die den Anspruch hatten etwas eigenständig neu zu schaffen.*	*The Chinese are good at copying things and at offering them in comparable or better quality at lower cost. [...] But I never got to impression that they were eager to innovate, to create something new.*
	Manager Quality (P)	*Sie [L-C] sind natürlich immer wieder gehemmt durch die starke Fluktuation. Ich denke dass tut ihnen arg weh. So dass sie da oft Not haben wieder da hin zu kommen wo sie schon mal waren, wenn ihnen Leute verloren gehen.*	*The fluctuation slows them down. […] Every time they loose people they struggle to get back to their prior level of expertise.*
	Vice President (C)	*Ich habe manchmal den Eindruck dass es denen relativ ist ob die das Werk behalten, ob es wächst, ob man es zumacht. [...] Das ist schon eine Mentalitätsfrage. [...] Man hat immer das Gefühl, dass die sich auch mit dem nächsten Leben anfreunden können. Während die Chinesen halt im Hier und jetzt Leben und für Geld und*	*Sometimes I get the feeling that they [L-I] do not care whether they keep the plant, it gets expanded or terminated. [...]It is related to their mentality. [...] It seems that they can also arrange themselves with the next life, whereas the Chinese live here and now and would do anything for money and career.*

		Karriere alles machen.	
	Vice President (P)	*Was wir machen müssen, und auch schon machen, ist dass wir Produkte für den asiatischen Markt in Asien entwickeln. [...] Wir haben eigentlich keinen blassen Schimmer: was ist denn ausreichend in China? Wir bringen immer noch 'made in Germany' Produkte hin die wirklich gute aber eben' high-end' Produkte sind.*	*We have to develop more products for Asia in Asia. [...] Because we have no clue what is sufficient in China. We continue to bring in products made in Germany. These are good products, but they are very high-end.*
	Vice President Technical	*Bei den LED Lampen haben wir mehr oder weniger 100 Prozent China. Rein aus Kostengründen. Denn die Materialien kommen alle aus China.*	*Almost 100 percent of LED assembly takes place in China. This is related to cost, because all materials come from China.*
		Mit Universitäten sind wir ausreichend versorgt. Wenn wir irgendetwas brauchen, spezielle Untersuchungen oder so bzgl. Chemie und sonstiges, haben wir die entsprechenden Ressourcen. Wir gehen an die Universitäten und sprechen da die Institute direkt an und die machen dann die Messungen für uns.	*We have a good university infrastructure here. If we need a special chemical analysis or other services we have the resources here. We will approach the institutes and they run the analyses for us.*

Quotes in chapter 6

Unit	Title	German language quotes (original)	English language quotes (translation)
AHK Shang-hai	Head of Recruiting and Training	*Die Lehrer sind direkt beim chinesischen Institut angestellt. Die haben mit [AC-C] erst einmal direkt nichts zu tun. Sie profitieren aber sehr davon dass die [AC-C] mit im Boot sind. Einfach weil das Niveau ein ganz anderes ist, weil im Produktionsprozess in so einem Unternehmen die Qualitätsansprüche sehr hoch sind.*	*The teachers are employed at the institute and are therefore not directly involved with [AC-C]. But they benefit from its presence in the program indirectly because its high quality standards increase the aspirations levels of the entire institute*
AC-C	Apprentice-ship Manager	*Wir haben hier wirklich eine sehr große Fluktuation - das ist ein chinesisches 'Habit'. [...] Weil die Chinesen nach zwei bis drei Jahren den Betrieb wechseln wollen.*	*We have a really strong fluctuation here. That is a Chinese habit. […] They want to switch the company after two to three years.*
	General Manager	*[...] unser interner Sondermaschinenbau, die arbeiten ja sehr viel mit lokalen Zulieferern zusammen. Wenn sie da mal einen entwickelt haben, der ist dann natürlich in der gesamten Industrieumgebung hier der gefragte Zulieferer. Ist für uns ein zweischneidiges Schwert. Weil auf der einen Seite wollen wir natürlich nicht unser Know-how an einen Dritten weitergeben. Aber so lange das normaler Anlagenbau ist, ist das auch so eine gewisse Entwicklungshilfe für das ganze Umfeld hier.*	*[...] our internal machine building division works closely with local suppliers. Once you develop one, it becomes the preferred supplier in the entire region. This is a double-edged sword for us. We do not want disseminate our know-how to third parties. But as long as this is about ordinary machine building activities, we see it as some kind of development aid to the region.*
	Vice President MFG (S)	*Wir machen sehr tiefe, nachhaltige Lieferantenentwicklungsprogramme. Teilweise sitzen da zehn unserer Leute beim Lieferanten und gehen in die Prozesse rein und machen mit dem Lieferanten gemeinsam Prozessverbesserung. [...] Je nach Ausgangslage des Lieferanten helfen wir signifikant seine Qualität zu verbessern, über den Einsatz der entsprechenden Methoden, über die Qualifikation der Mitarbeiter. Wir arbeiten sehr stark an dem Thema Produktivität und damit Kosten. Wir zeigen ihnen wie eine schlanke Produktion organisiert sein sollte. Und auch die Reduzierung der Bestände, Erhöhung der Flexibilität, Reduzierung der Durchlaufzeiten.*	*We engage in comprehensive, sustainable supplier development programs. Sometime ten of our people will work at the supplier's site to jointly optimize their processes. Depending on their level we help them to improve their quality significantly with the help of technical procedures and qualification. We work on improving productivity and therefore cost, on how to organize lean production, and on reducing inventory and cycle time and improving flexibility.*
		Ich habe regelmäßig Lieferanten hier die wir ausbilden - also wo wir Schlüsselleute ausbilden - bis hoch zum CEO, der dann das Know-how in seine Firma zurücknimmt und dort implementiert.	*We qualify key personnel of our suppliers on a regular basis, including the CEO. These people take the know-how back and implement it.*
	Vice President MFG (S)	*Die Leute haben gesagt nur eine Blackbox nach China, sonst ist das Know-how in zwei Tagen beim Wettbewerber. Weil hier einfach die Fluktuation sehr hoch war. [...] Als ich angefangen habe vor drei Jahren haben wir von hundert dreißig verloren - also 30 Prozent ungefähr. Und da macht man sich echt Sorgen. Seit Germany sieht dass wir hier eine stabile Organisation haben können sie diese Diskussion entspannter führen. Aber es weiterhin ein 'Key Point of Concern'. [...] Denn es ist ganz klar: China Weltmeister im Kopieren.*	*We were only sending a black-box to China. People were concerned that the know-how would disseminate to competitors within two days, because our fluctuation was very high. [...] When I started three years ago we lost 30 percent [per year]. Now our organization is more stable and Germany is more comfortable. But it remains a key point of concern, because China is the world champion in product piracy.*
		Die Kernmaßnahme ist dass wir geben nie ein gesamtes 'Know-how Package' an ein Team Member. [...] Wir splitten immer die 'Responsibilities', so dass selbst wenn wir eine undichte Stelle haben nie einer auf das gesamte Know-how zugreifen kann.	*The key measure is not to give all know-how to a single team member. We split the responsibilities in projects among our people, so in case we have a leak no one can access the entire knowledge.*

AM-C	General Manager	*Wir sind in Changsha und in Hunan ein Vorzeigebetrieb für Erfolg, für gute Zusammenarbeit mit Stadt, Partei und dem Industriepark, so dass man gerne zu uns rauskommt. Der Industrieparkpräsident z.B. kommt gerne mit Besuchern.*	*In Changsha, we are a role model for success and for cooperation with the city, the party, and the industry park. The authorities, for example the president of the industry park, visit us frequently with their visitors.*
		Wir haben hier Kernfähigkeiten in der Fabrik, Technologien, die es nicht überall am Markt zu kaufen gibt. Die schützen wir bewusst indem wir die Maschinen selber herstellen.	*We have core capabilities in the plant. Technologies you cannot just buy on the market. We protect these technologies by building our machinery and equipment in-house.*
		Wir wollten eigentlich mit unserem Lizenznehmen damals weiter zusammenarbeiten, indem er uns weiter beliefert. Was soll man sagen: der hat die Qualität die wir brauchen nicht erreicht, er hat auch kein Interesse daran gehabt die Qualität zu bringen, hat keinerlei Anstrengungen selbst unternommen um sich dort zu verbessern. Und dann - sag ich mal - fällt man bei der [A-PARENT]relativ schnell raus.	*We planned to continue supply relations with our former licensee. But he did not meet our quality requirements. And he did not make sufficient efforts to improve. Then you lose your business with [A-PARENT] immediately.*
L-PAR HQ	Manager Global Quality	*[L-PARENT] hat relativ wenig Ressourcen für dieses 'Supplier-Quality Management'. Klassischerweise machen einmal im Jahr eine Lieferantenbeurteilung. Und wenn er dann schlecht ist wird er 'ausgephased' [sic] und man sucht sich einen anderen. Diese aktive Lieferantenentwicklung ist nicht üblich. [...] Da haben wir Schwächen, und da muss eine neue Organisation aufgesetzt werden.*	*[L-PARENT] has limited resources for this supplier-quality management. Usually we evaluate our suppliers once a year. And if he scores poorly we will chose another one. The active development of suppliers is not common. [...] This is a weakness. It requires a new organization.*
	Manager Quality (P)	*Wir wissen, es gibt dort eine hohe Fluktuation. Und wir wissen auch, dass Leute die wir hier gut ausgebildet haben schnell wieder weg waren und zur Konkurrenz gegangen sind. Das macht mich schon bedenklich irgendwo.*	*We are aware of the strong fluctuation, and we are also aware that people who got well educated in our plants left to competitors. That worries me.*
L-C	Vice President Technical	*Die Regierung benutzt uns gerne als Vorzeigebetrieb. Z.B. wenn sie andere Provinzen unterstützten mit Industrialisierung, dann bringen sie die Delegationen zu uns in die Company und sagen: stellt doch mal vor wie ihr das so macht.*	*The government uses us as role model, for example when they support other provinces with their industrial development. They come to our plant with their delegations and ask us to explain how we run our operations.*
		Unsere Konkurrenten schicken Ingenieure zum Lieferanten, und die arbeiten dann mit denen zusammen so lange bis es passt. [...] Da laufen sie natürlich Gefahr dass dieser Lieferant das verbesserte Material an irgendwelche Konkurrenten liefert. Das wird bei uns als Risiko gesehen. [...] Wir wollen nicht die Konkurrenz stärken.	*Our competitors send engineers to a supplier to work with him until the requirements are met. [...] By doing so you run the risk that this supplier will deliver the improved material also to your competitors. We see this as a risk. [...] We do not want to strengthen the competitors.*
L-I	Project Manager Technical	*Wir entwickeln z.B. exklusive Schaltungen für elektronischen Ballast. Eine Technologie die 'Inhouse' entwickelt wurde. Das wird dann auch nur mit 'Suppliern' gemacht die wirklich exklusiv für [L-PARENT] arbeiten. Wir differenzieren da zwischen den Technologien.*	*We develop exclusive circuits for electronic ballast. A technology developed in-house. For that we only work with suppliers who work exclusively for [L-PARENT]. We have a different approach for each technology.*

Appendix C: Interview Guidelines

Guideline 1: General Management (subsidiary)

Part A: Evidence for subsidiary evolution

How did the manufacturing operations of the subsidiary evolve over time?
- Product scope (variety of products and services produced by the subsidiary)
- Geographic scope (geographic markets served by the subsidiary)
- Value-add scope (share of product portfolio manufactured locally and value chain steps in local manufacturing)

How did the R&D operations of the subsidiary evolve over time?
- Scope of R&D activities (variety of product groups or technologies covered)
- Geographic scope of R&D activities (geographic markets served by the subsidiary)
- Value-add of R&D activities (application work, product adjustment, or new development)

What could be suitable *temporal phases* of this development? (key milestones)

Part B: Driving forces of subsidiary evolution

Subsidiary-endogenous environment

Orientation and incentives
- How did the goals and strategies of subsidiary management evolve over time?
- How did the level of confidence of subsidiary personnel evolve?

Formal configurations
- Which formal configurations were important for the development of the subsidiary?
  - Ownership & mode of entry
  - Organizational aspects (e.g. re-organization of organizational set-up)
  - Physical facilities (e.g. spare capacities or bottlenecks)

Capabilities
- What are core capabilities for manufacturing in the industry? How did the capabilities evolve?
- What are core capabilities for R&D? How did these capabilities evolve?
- Did this upgrading of capabilities facilitate or induce an expansion of subsidiary operations?

Initiative
- What were the key initiatives of the subsidiary to upgrade its capabilities? (e.g. recruiting efforts, vocational training initiatives, systematic competence development)
- Did the subsidiary attempt to proactively upgrade its operations? (e.g. lobby the HQ to attract new product mandates)

MNE-internal environment

Motives of HQ management
- What were the motives of HQ management for setting up the subsidiary? What is today role assigned to the subsidiary?
- What were the motives behind the location choice for the subsidiary?

MNE strategy
- Which MNE-wide strategies were most relevant for the development of the subsidiary? (e.g. global restructuring/cost-cutting programs or portfolio decisions)

HQ-Subsidiary exchange relations
- What are the relevant HQ-units for the subsidiary? (e.g. national/global HQ or Lead Plants)
- How integrated are the operations of the subsidiary with these HQ units? (e.g. frequency and mode of interaction or personal ties between key personnel)
- What was the role of expatriate managers during the evolution of the subsidiary?
- To what extent did the HQ transfer technologies and capabilities to the subsidiary?
  - Did barriers to knowledge exchange exist? How did they evolve over time?

Governance of the subsidiary

- How did the incentive system for subsidiary management evolve? Did it appreciate an expansion of operations? Did it appreciate contributions to the MNE-network?
- Did the subsidiary have the autonomy to run its operations and pursue initiatives?

Contributions to the MNE
- What did the subsidiary contribute to the MNE? (e.g. access to material and component suppliers, access to localized knowledge, endogenous innovations)
- How did the HQ's attitude towards input from the subsidiary evolve? How did this affect the level of attention and support received from the HQ?

Horizontal relations with sister subsidiaries in the MNE-network
- With which sister subsidiaries did the subsidiary interact frequently? (in particular China/India)
- How integrated were day-to-day operations? Were technologies and capabilities exchanged?

Horizontal competition with sister subsidiaries
- Is there an overlap in activities with subsidiaries in China, India and/or Asia-Pacific?
- Did the sister subsidiaries compete with each other for product or R&D mandates?
- How did this competition affect the strategic behavior of the subsidiary?

External environment

Configurations of the regional host environment
- Did the current location fulfill the expectations of the subsidiary/the MNE?
- Which regional configurations were (not) supportive for the evolution of the subsidiary? (e.g. labor market / universities, physical infrastructure, labor unions, government, and (proximity to) competing and related firms)

Configurations of the national host environment
- Which national configurations were (not) supportive for the evolution of the subsidiary? (e.g. national policies and regulation or requirements of domestic demand)

Configurations of the global economy and the industry
- How did trends in the global economy and the industry impact the subsidiary? (e.g. financial and economic crisis after 2007 or emergence of new technologies)

Relations to external partners
- With which external actors does the subsidiary maintain (embedded) relations? (type of actors and geographic level)
- How did the overall number/variety of external relations evolve over time?
- What were the motives of the subsidiary to establish and/or intensify external relations?
- From which external partner did the subsidiary learn the most / was impacted in another way?
- How did external partners contribute to the evolution of the subsidiary over time? How did these external relations impact the subsidiary's MNE-internal role?

Part C: Impact on the host environment

- How and to what extent did the subsidiary contribute to an upgrading of the capabilities / operations of external partners? (e.g. technologies, trainings, or access to global value chains)
- How did the subsidiary contribute to unrelated firms and institutions in the regional/national host environment?

Part D: Relevance of the different environments

- Which single decision/event was most important for the evolution of the subsidiary?
- Which environment has contributed most to the upgrading of subsidiary capabilities and operations? (Subsidiary-level, MNE-internal environment, external environment)
- How did the relevance of the environments evolve? (ramp-up phase, growth phase, current phase, trend)

Guideline 2: Manufacturing (subsidiary)

Part A: Evidence for subsidiary evolution

How did the manufacturing operations of the subsidiary evolve over time?
- Product scope (variety of products and services produced by the subsidiary)

- Geographic scope (geographic markets served by the subsidiary)
- Value-add scope
  - Share of subsidiary product portfolio manufactured by the subsidiary
  - Value chain steps covered, e.g.
    - Simple, final assembly of imported components
    - "End-to-end" manufacturing along standardized processes
    - "End-to-end" manufacturing along non-standard, customized processes
    - New steps upstream (product design) or downstream (packaging)

What could be suitable *temporal phases* of this development? (key milestones)

Part B: Driving forces of subsidiary evolution

Subsidiary-endogenous environment

Orientation and incentives
- How did the goals and strategies of subsidiary management evolve over time?
- How did the level of confidence of subsidiary personnel evolve?
- Were the goals of subsidiary and HQ management aligned?

Formal configurations
- Which formal configurations were important for the development of the subsidiary?
  - Ownership & mode of entry
  - Organizational aspects (e.g. re-organization of organizational set-up)
  - Physical facilities (e.g. spare capacities or plant layout)

Capabilities
- What are core capabilities for manufacturing in the industry? How did the capabilities evolve?
  - Production planning and control
  - Quality management
  - Process efficiency (e.g. process automation)
  - Process flexibility (e.g. up/downscale volumes / switch between products)
  - Organizational flexibility (e.g. adjust work/responsibilities to market requirements)
- Did the upgrading of capabilities go beyond the requirements of existing mandates?
- Did the upgrading of capabilities facilitate or induce an expansion of subsidiary operations?
- What were/are the most prevalent capability gaps of the subsidiary?

Initiative
- What were the key initiatives of the subsidiary to upgrade its capabilities?
  - Internal: systematic competence development
  - External: recruiting or cooperation with domestic firms/universities
- What were the key initiatives of the subsidiary to upgrade operations? (e.g. lobby the HQ to attract additional product mandates)

MNE-internal environment

Motives of HQ management
- What were the motives of HQ management for setting up the subsidiary? What is the assigned role of the subsidiary today?
- What were the motives behind the location choice for the subsidiary?

MNE strategy
- Which MNE-wide strategies were most relevant for the development of the subsidiary? (e.g. global restructuring/cost-cutting programs or portfolio decisions)

HQ-Subsidiary exchange relations
- How integrated is the subsidiary with relevant HQ units? (e.g. frequency and mode of interaction, personal ties between key personnel, cooperative vs. competitive spirit)
- To what extent did the HQ transfer technologies and capabilities to the subsidiary?
  - Did barriers to knowledge exchange exist in the HQ? How did they evolve over time?
  - Was the subsidiary able to make effective use of the transfers from the HQ?
- What was the role of expatriate managers in manufacturing for the evolution of the subsidiary?
  - How many expatriates were delegated to the subsidiary? In which functions?
  - How did the switch from expatriate to domestic manager affect HQ-relations?

Governance of the subsidiary

- How did the incentive system for subsidiary management evolve? Did it appreciate an expansion of operations? Did it appreciate contributions to the MNE-network?
- How did the autonomy of the subsidiary evolve? (internal: e.g. quality management, and organizational development; external: e.g. recruiting, supplier and customer interface)
- Did the location in the periphery of the MNE affect the level of autonomy of the subsidiary?

Horizontal relations with sister subsidiaries in the MNE-network

- With which sister subsidiaries did the subsidiary interact frequently? (in particular China/India)
- How integrated are day-to-day manufacturing operations with these units? (e.g. frequency, and mode of interaction, personal ties, cooperative vs. competitive spirit)
- Did the subsidiaries exchange technologies and capabilities?
- Did the subsidiary absorb staff from other subsidiaries?

Horizontal competition with sister subsidiaries

- Is there an overlap in the product portfolio with subsidiaries in China, India and Asia-Pacific?
- Did the sister subsidiaries compete with each other for product mandates?
- How did the relative position of the subsidiary vs. sister subsidiaries evolve over time? (e.g. in terms of cost position or capabilities)
- How did this competition affect the strategic behavior of the subsidiary?

External environment

Configurations of the regional host environment

- Did the current location fulfill the expectations of the subsidiary/the MNE?
- Which regional configurations were (not) supportive for the evolution of the subsidiary? (e.g. labor market / universities, physical infrastructure, labor unions, and government)
- How did competing and related firms affect the subsidiary?
  - Positive: e.g. absorption of qualified staff or access to domestic suppliers
  - Negative: e.g. competition on the labor market or congestion of infrastructure
- What was the role of geographic proximity for this impact of competing/related firms?

Configurations of the national host environment

- Which national configurations were (not) supportive for the evolution of the subsidiary?
  - National policies and regulation (e.g. tariffs or local content requirements)
  - Requirements of domestic demand (e.g. adoption of products/processes)

Configurations of the global economy and the industry

- How did trends in the global economy and the industry impact the subsidiary? (e.g. financial and economic crisis after 2007 or emergence of new technologies)

Relations to external partners

- With which external actors does the subsidiary maintain (embedded) relations?
- How did the overall number/variety of external relations evolve over time?
- What were the motives of the subsidiary to establish and/or intensify external relations?
- Which partners were most important for running day-to-day manufacturing operations?
- From which external partner did the subsidiary learn the most / was impacted in another way? (e.g. improved process efficiency, transfer of technologies or adoption of best practices)
- What was the role of geographic proximity for this impact of external partners?
- How did external partners contribute to the evolution of the subsidiary over time?
- How did these external relations impact the subsidiary's MNE-internal role? (trade-off?)

Part C: Impact on the host environment

- How and to what extent did the subsidiary contribute to an upgrading of the capabilities / operations of external partners? (e.g. technologies, trainings, or access to global value chains)
- How did the subsidiary contribute to unrelated firms and institutions in the regional/national host environment?

Part D: Relevance of the different environments

- Which single decision/event was most important for the evolution of the subsidiary?
- Which environment has contributed most to the upgrading of subsidiary capabilities and operations? (Subsidiary-level, MNE-internal environment, external environment)
- How did the relevance of the different environments evolve over time? (ramp-up phase, growth phase, current phase, future trend)

Guideline 3: R&D (subsidiary)

Part A: Evidence for subsidiary evolution

How did the R&D operations of the subsidiary evolve over time?

- Scope of R&D activities (variety of product groups or technologies covered)
- Geographic scope of R&D activities (geographic markets served by the subsidiary)
- Value-add of R&D activities
  - Share of the subsidiary's resources dedicated to R&D
  - Complexity of R&D activities covered, e.g.
    - Adoption of products/technologies to host markets
    - Minor product design activities
    - "End-to-end" new product design (design, prototyping, scale-up)
    - Research into advanced materials/technologies

What could be suitable *temporal phases* of this development? (key milestones)

Part B: Driving forces of subsidiary evolution

Subsidiary-endogenous environment

Orientation and incentives

- How did the goals and strategies of the R&D team evolve over time?
- How did the level of confidence of the R&D personnel evolve?

Formal configurations

- Which formal configurations were important for the evolution of subsidiary-level R&D?
  - Organizational aspects (e.g. setup of R&D organization)
  - Physical R&D facilities (e.g. testing facilities or labs)

Capabilities

- What are core capabilities for R&D in the industry? How did the capabilities evolve?
  - Engineering skills for incremental product improvements
  - Innovative capabilities for new product design
  - Relational capabilities to connect to external knowledge sources
  - Commercial capabilities to identify applications for innovations
- Did the upgrading of capabilities go beyond the requirements of existing mandates?
- Did this upgrading of capabilities facilitate or induce an expansion of subsidiary operations?
- What were/are the most prevalent capability gaps of the subsidiary?

Initiative

- What were the key initiatives of the subsidiary to upgrade its capabilities?
  - Internal: systematic competence development
  - External: recruiting or R&D cooperation with domestic firms/universities
- Did the subsidiary attempt to proactively upgrade its R&D operations? (e.g. lobby the HQ to attract additional R&D responsibilities)

MNE-internal environment

Motives of HQ management

- What were the motives of HQ management for setting up R&D operations in the subsidiary?

MNE strategy

- Which MNE-wide strategies were most relevant for the evolution of subsidiary-level R&D? (e.g. centralization vs. decentralization of R&D responsibilities)

HQ-Subsidiary exchange relations

- How integrated are R&D activities of the subsidiary integrated with relevant HQ units? (e.g. frequency and mode of interaction, personal ties, cooperative vs. competitive spirit)
- To what extent did the HQ transfer technologies and capabilities to the subsidiary?
  - Did barriers to knowledge exchange exist in the HQ? How did they evolve over time?
  - Was the subsidiary able to make effective use of the transfers from the HQ?
- What was the role of expatriate managers in R&D for the evolution of the subsidiary?
  - How many expatriates were delegated to the subsidiary? In which functions?

- How did the switch from expatriate to domestic manager affect HQ-relations?

Governance of the subsidiary
- How did the incentive system for the R&D team evolve? Did it appreciate an expansion of R&D operations? Did it appreciate contributions to the MNE-network?
- How did the autonomy of the subsidiary in R&D evolve? (internal: e.g. development initiative; external: e.g. university linkages)
- Did the location in the periphery of the MNE affect the autonomy of the R&D team?

Horizontal relations with sister subsidiaries in the MNE-network
- With which sister subsidiaries did the R&D team interact frequently? (in particular China/India)
- How integrated are day-to-day R&D activities with these units? (e.g. frequency, and mode of interaction, personal ties, cooperative vs. competitive spirit)
- Did the subsidiaries exchange technologies and capabilities?
- Did the subsidiary absorb staff from other subsidiaries?

Horizontal competition with sister subsidiaries
- Is there an overlap of the R&D mandate with subsidiaries in China, India and Asia-Pacific?
- Did the sister subsidiaries compete with each other for R&D mandates?
- How did the relative position of the subsidiary vs. sister subsidiaries evolve over time? (e.g. in terms of cost position or capabilities)
- How did this competition affect the strategic behavior of the subsidiary?

External environment

Configurations of the regional host environment
- Did the current location fulfill the expectations of the subsidiary/the MNE?
- Which regional configurations were (not) supportive for R&D in the subsidiary? (e.g. labor market / universities, physical infrastructure, labor unions, and government)
- How did competing and related firms affect the subsidiary?
- What was the role of geographic proximity for this impact of competing/related firms?

Configurations of the national host environment
- Which national configurations were (not) supportive for the evolution of the subsidiary?
  - National policies and regulation (e.g. IP regime)
  - Requirements of domestic demand (e.g. adoption of products/processes)

Configurations of the global economy and the industry
- How did trends in the global economy/industry impact the subsidiary? (e.g. new technologies)

Relations to external partners
- With which external actors does the R&D team maintain (embedded) relations?
- How did the overall number/variety of external relations evolve over time?
- What were the motives of the R&D team to establish and/or intensify external relations?
- From which external partner did the subsidiary learn the most / was impacted in another way?
- What was the role of geographic proximity for this impact of external partners?
- How did external partners contribute to the evolution of the subsidiary over time?
- How did these external relations impact the subsidiary's MNE-internal role? (trade-off?)

Part C: Impact on the host environment

- How and to what extent did the R&D team of the subsidiary contribute to an upgrading of the capabilities / operations of external partners?
- How did the R&D activities of the subsidiary contribute to unrelated firms and institutions in the regional/national host environment?

Part D: Relevance of the different environments

- Which single decision/event was most important for the evolution of R&D in the subsidiary?
- Which environment has contributed most to the upgrading of subsidiary capabilities and operations? (subsidiary-level, MNE-internal environment, external environment)
- How did the relevance of the different environments evolve over time? (ramp-up phase, growth phase, current phase, future trend)

Guideline 4: Human Resources (subsidiary)

Part A: Evidence for subsidiary evolution

How did the manufacturing and R&D operations of the subsidiary evolve over time?
- Product scope
- Geographic scope
- Value-add scope

Which experience and/or data from the HR perspective can illustrate this evolution? (e.g. headcount development in different functions / different qualification levels)

Part B: Driving forces of subsidiary evolution

Subsidiary-endogenous environment

Orientation and incentives
- How did the incentives for subsidiary management and staff develop? (e.g. did incentive system favor the expansion of operations or the generation of knowledge?)

Formal configurations
- Which organizational aspects were supporting the evolution of the subsidiary? (e.g. best practices in organizational set-up, training, knowledge management)
- How did the human resource portfolio of the subsidiary evolve over time?
  - Formal qualification/education levels (i.e. share of engineers)
  - Work backgrounds (graduates vs. lateral hires)
  - Cultural backgrounds (expats vs. local)
  - Avg. tenure and attrition rates
- How did this portfolio support the evolution of the subsidiary?

Capabilities
- What are core capabilities in manufacturing in the respective industry? How did these evolve?
  - Production planning and control
  - Quality management
  - Process efficiency (e.g. process automation)
  - Process flexibility (e.g. up/downscale volumes or switch between products)
  - Organizational flexibility (e.g. adjust work/responsibilities to market requirements)
- What are core capabilities/skills in R&D? How did these evolve over time in the subsidiary?
  - Engineering skills for incremental product improvements
  - Innovative capabilities for new product design
  - Relational capabilities to connect to external knowledge sources
  - Commercial capabilities to identify applications for innovations
- Did the upgrading of capabilities go beyond the requirements of existing mandates?
- Did this upgrading of capabilities facilitate or induce an expansion of subsidiary operations?
- What were/are the most prevalent capability gaps of the subsidiary?

Initiative
- To what extent did subsidiary-internal initiatives drive this capability upgrading?
  - Internal: systematic competence development
  - External: recruiting
- Did the initiatives go beyond day-to-day requirements? (Investment for future requirements)

MNE-internal environment

Motives of HQ management
- What were the motives of the HQ for setting up the subsidiary? (e.g. cost and qualification of labor?)
- What were the HQ's motives behind the location choice? (e.g. regional labor market)

HQ-Subsidiary exchange relations
- What was the role of expatriate managers in R&D for the evolution of the subsidiary?
  - How many expatriates were delegated to the subsidiary? In which functions?
  - Who initiated these delegations?
  - How did the switch from expatriate to domestic manager affect HQ-relations?

Governance of the subsidiary

- How did the subsidiary's autonomy in recruiting/training develop over time? Did the subsidiary experience resources restrictions in terms of hiring sufficient and sufficiently qualified labor?

Horizontal relations with sister subsidiaries in the MNE-network

- To what extent did the subsidiary exchange staff with sister subsidiaries?
- To what extent did the subsidiary learn from sister subsidiaries? (e.g. through joint trainings)
- Did the subsidiaries of the MNE compete with each other for resources?
- How did the bargaining position of the subsidiary in the MNE-network evolve over time?

External environment

Configurations of the regional host environment

- Which regional configurations were (not) supportive for the evolution of the subsidiary?
  - Labor market (e.g. quality, availability, and salary levels of labor)
  - Regional administration (e.g. investment in education or labor-related policies)
  - Non-governmental actors (e.g. trade unions or other interest groups)
- How did competing and related firms affect the accessible labor market of the subsidiary?
  - Positive: e.g. overall skill level in labor market
  - Negative: e.g. rising salary levels, attrition, shortage of skilled staff

Configurations of the national host environment

- Which national configurations were (not) supportive for the evolution of the subsidiary? (e.g. labor law)

Part C: Relevance of the different environments

- Which single decision/event was most important for the evolution of the subsidiary?
- Which environment has contributed most to the upgrading of subsidiary capabilities and operations? (subsidiary-level, MNE-internal environment, external environment)
- How did the relevance of the different environments evolve over time? (ramp-up phase, growth phase, current phase, future trend)

Guideline 5: Purchasing (subsidiary)

Part A: Evidence for subsidiary evolution

How did the manufacturing and R&D operations of the subsidiary evolve over time?

- Product scope
- Geographic scope
- Value-add scope

Which experience and/or data from the purchasing perspective can illustrate this evolution? (e.g. development of purchasing volume of the subsidiary or localization of purchasing)

Part B: Driving forces of subsidiary evolution

External environment

Assessment of supplier market on the regional level

- How was the quality of the regional supplier market in regards to the MNE's requirements?
- Did the presence of competing and related firms impact the subsidiary on the supply side?
  - Positive: e.g. experience and scale economies in the supplier market
  - Negative: e.g. bottlenecks for materials or services
- How did regional authorities impact the supplier market (e.g. strategic investments)

Assessment of supplier market on the national level

- How was the quality of the national supplier market in regards to the MNE's requirements?
- How did national authorities impact the supplier market (e.g. import duties for components)

Supply structure of the subsidiary

- How did the supply structure of the subsidiary evolve over time?
  - Share of home- versus host-market supply
  - Share of domestic versus foreign/multinational suppliers

- Sophistication of supply in the host market / from domestic suppliers

Motives and barriers to localize supply

- What was the motivation of subsidiary management to localize supply?
- What was the attitude of HQ management in the context of localizing supply?
- Did the HQ drive / facilitate the localization of supply?
- What were barriers for the localization of supply? (In the subsidiary, HQ, supplier market)

Consequences of localized supply for the subsidiary

- How did the localization of supply impact the subsidiary's …
  - … operations? (e.g. cost competitiveness, output quality)
  - … ability / motivation to upgrade? (e.g. by adopting best practices)
  - … integration with the MNE? (trade-off internal/external integration?)

Part C: Analysis of selected supplier relations

Identification of key suppliers

- Which were/are the most important supply relations of the subsidiary? (in terms of length, depth, and/or volume of supply and/or frequency of interaction)

Contribution of selected suppliers to subsidiary evolution

- How were/are manufacturing and R&D operations integrated with these suppliers?
  - Which units/individuals are involved with the supplier?
  - What is the integration in terms of frequency and more of interaction, personal ties, cooperative vs. competitive spirit
- What did the subsidiary learn / absorb from these suppliers?
  - Experienced staff
  - Market intelligence
  - (organizational/technical) best practices
  - New technologies or technical capabilities
- Did the subsidiary proactively search for these inputs?
- Through which mechanisms were the inputs transferred? What was the role of geographic proximity to the supplier for these transfers?
- What was the subsidiary's ability to absorb these inputs? (e.g. in terms of knowledge and technology gap to the supplier or willingness of subsidiary staff to learn from the supplier)
- Could the relation to the suppliers have been utilized more successfully?
- Did the subsidiary transfer the new knowledge from the supplier to the HQ or sister subsidiaries? How did this affect the MNE-internal position of the subsidiary?

Contribution to the upgrading of selected suppliers

- How did the operations and capabilities of the supplier evolve?
  - Variety in product portfolio
  - Geographic scope (e.g. integration in the global value chain of the MNE)
  - Value chain steps covered
- Did the subsidiary transfer technological knowledge to the supplier?
- Who initiated these transfers? Through which mechanisms were was it transferred?
- Did the supplier adopt (managerial/organizational) best practices from the subsidiary?
- Was the supplier required/encouraged to adjust its processes/products to meet the MNE- standards? (e.g. quality standards, ISO certifications, social and environmental standards)
- Was the supplier capable to absorb this new knowledge? (e.g. in terms of knowledge and technology gap or willingness to learn and upgrade) Could it have utilized the relation to the subsidiary more successfully?

Guideline 6: MNE-Headquarters

Part A: Evidence for subsidiary evolution

How did the manufacturing and R&D operations of the subsidiary evolve over time?

- Product scope
- Geographic scope
- Value-add scope

How did the contribution of the subsidiary to the MNE evolve over time? (e.g. global mandates for products/components/services, access to global suppliers in the host environment, access to knowledge)

How does this evolution compare to other subsidiaries of the MNE? (in particular China vs. India)

Part B: Driving forces of subsidiary evolution

MNE-internal environment

Motives of HQ management
- What were the motives for setting up the subsidiary? What is the role of the subsidiary today?
- What was the rationale behind the location choice? (national/regional level)

MNE strategy
- Which MNE-wide strategies have affected the evolution of the subsidiary? (e.g. global crisis response (restructuring/cost-cutting programs) or re-organization of MNE)

Governance of the subsidiary
- What were the incentives for subsidiary management (e.g. in terms of upgrading operations and capabilities or contributing knowledge to the MNE)
- How did the autonomy of subsidiary management to run its operations evolve?

HQ-Subsidiary relations
- How integrated is the subsidiary with the HQ?
  - Integration along the supply chain
  - Frequency and mode of interaction and personal ties of key personnel
- Were goals of HQ and subsidiary management aligned? In which areas did conflicts arise?
- What was the role of expatriate managers for HQ-Subsidiary relations?

HQ-level contribution to subsidiary evolution
- To what extent did the HQ drive an upgrading of the product/value-add scope of the subsidiary?
- To what extent did the HQ transfer technologies and capabilities to the subsidiary?
- What were barriers to such transfers of knowledge/technologies? (e.g. IP regime in the host country, fluctuation in the subsidiary, lack of social ties)
- Have these barriers impeded the evolution of the subsidiary?

Subsidiary-endogenous environment

Capabilities
- What are core capabilities in the industry? How did these capabilities evolve in the subsidiary?
- Did the capabilities of the subsidiary facilitate / impede an upgrading of its operations?

Initiative
- Are you aware of initiatives of the subsidiary to upgrade its capabilities? (e.g. recruiting efforts, vocational training initiatives, systematic competence development)
- Are you aware of initiatives of the subsidiary to proactively upgrade its operations? (e.g. lobby the HQ to attract additional product mandates)

External environment

What are the particularities of the host environment?

How did the host environment affect the evolution of the subsidiary?
- Which configurations of the regional host environment were (not) supportive for the subsidiary? (e.g. labor market / universities, physical infrastructure, labor unions, and government)
- Which configurations of the national host environment were (not) supportive for the subsidiary? (e.g. national policies and regulation or requirements of domestic demand)
- How did trends in the global economy and the industry impact the subsidiary? (e.g. financial and economic crisis after 2007 or emergence of new technologies)

Guideline 7: External Partners (Suppliers)

Part A: Contribution of partner to subsidiary evolution

Outside-in assessment of the focal subsidiary
- Did you observe an evolution of the manufacturing and R&D operations of the subsidiary? (in terms of product scope, geographic scope, and value-add scope)

Contribution of partner to subsidiary evolution

- How did your firm contribute to this evolution of the subsidiary?
  - How integrated were day-to-day operations?
  - Did the subsidiary discover new ways "to get things done from your firm"? Did it adopt some of it?
  - Did the subsidiary absorb technologies/capabilities from your firm? Was this an initiative of your firm or of the subsidiary? Through which mechanisms was it transferred?

Absorptive capacity of the subsidiary

- How did you perceive the subsidiary's ability and willingness to absorb the knowledge / best practices from your firm? Could the subsidiary have utilized your expertise more successfully?

Part B: External impact of the subsidiary on the partner

Contribution to partner

- How did the subsidiary contribute to upgrade your firm's operations?
  - Variety in product portfolio (e.g. new product requirements)
  - Geographic scope (e.g. integration in MNE supply chain)
  - Value-add scope (e.g. outsourcing of value-add steps by the subsidiary)
- How did the subsidiary contribute to upgrade your firm's capabilities?
  - How integrated were day-to-day operations?
    - With which units/individuals of the subsidiary were you involved?
    - Was the relation based on personal ties?
    - What was the frequency and mode of interaction?
    - Did both partners stick to commitments? Practice of joint responsibility?
  - Was your firm required/encouraged to adjust products/processes to meet the subsidiary's standards? What did your firm learn from these efforts?
  - Did your firm adopt best practices from the subsidiary?
  - Did your firms absorb technologies/capabilities from the subsidiary? Was this an initiative of your firm or of the subsidiary? Through which mechanisms were technologies/capabilities transferred?

Absorptive capacity of the partner

- To what extend could your firm absorb the knowledge from the subsidiary?
- Could your firm have utilized the relation to the subsidiary more successfully? What were the barriers? (e.g. lack of technical skills)

Erklärung zur Dissertation

Gemäß §6(1) der Promotionsordnung der Naturwissenschaftlichen Fakultät der Gottfried Wilhelm Leibniz Universität Hannover für die Promotion zum Dr. rer. nat.

Hierdurch erkläre ich, dass ich die vorliegende Dissertation selbständig verfasst und die benutzten Hilfsmittel und Quellen sowie gegebenenfalls die zu Hilfeleistungen herangezogenen Institutionen vollständig angegeben habe.
Die Dissertation wurde nicht schon als Masterarbeit, Diplomarbeit oder andere Prüfungsarbeit verwendet.

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