Torben Pedersen
Lydia Bals
Peter D. Ørberg Jensen
Marcus M. Larsen *Editors*

The Offshoring Challenge

Strategic Design and Innovation for Tomorrow's Organization

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Editors
Torben Pedersen
Department of Strategic Management
Copenhagen Business School
Frederiksberg
Denmark

Peter D. Ørberg Jensen
Department of Strategic Management
Copenhagen Business School
Frederiksberg
Denmark

Lydia Bals
Department of Strategic Management
Copenhagen Business School
Schwalbach a. Ts.
Denmark

Marcus M. Larsen
Department of Strategic Management
Copenhagen Business School
Frederiksberg
Denmark

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Editors' Preface

This book is about offshoring; the geographical relocation of business tasks to foreign locations. The continuous search for efficiency gains and the goal of attaining a sustainable competitive advantage have steadily increased the volume of goods and services procured globally since the 1980s. In this context, the offshoring phenomenon has more recently stimulated much research towards understanding offshoring as a unique form of internationalization by particularly addressing how different environmental, firm strategy, and organizational factors influence which activities are being offshored, the choice of host location, and the mode of governance structure, as well as financial and non-financial performance consequences of this.

With this book, we wish to go beyond the antecedent-structure-outcome logic of offshoring. In particular, we focus on the challenges that firms face when deciding on offshoring activities to foreign locations and the measures that these firms take in dealing with this. To a large extent, offshoring can be regarded as a larger organizational reconfiguration affecting a number of dimensions, such as the contractual ownership and relationship of the offshoring setup, the geography of the host location, the interdependences and coordination mechanisms between the spatially differentiated organizational tasks, and the overall coherence of the globally dispersed organizational system. In this process, firms face a number of both organizational and environmental challenges that can deter and eventually undermine the initial rationales of deciding to engage in offshoring. Accordingly, firms often find that the process of offshoring requires new strategic approaches and business models that can keep unexpected challenges at bay.

The book is divided into six parts that explore different topics of the challenges that firms face when offshoring. The first part concerns offshoring strategy and business models. Firms often experience that the offshoring of activities to foreign locations require new strategies and business models that can accommodate for the challenges of coordinating a globally dispersed organization. The second and third parts investigate the organizational and process dynamics in offshoring knowledge-intensive work and research and development, respectively. In contrast to offshoring more labor-intensive and standardized activities, the offshoring of

knowledge-intensive activities such as research and development challenges firms' ability to successfully reintegrate the offshored activities into the organization. The fourth part deals with risks and influences stemming from the location that firms face in the process of offshoring. Increasing offshoring exposes firms to environmental risks that growingly need to be incorporated in business models. The fifth part takes a broader perspective on offshoring by investigating industry and network perspectives and consequences on offshoring. Finally, the sixth part explores new theoretical approaches in offshoring research by suggesting that extant theories of internationalization may be inadequate to explain the offshoring phenomenon.

The process of preparing this book included a successful workshop at Copenhagen Business School on October 27–28, 2011, where most of the contributors to this book presented their chapters and received feedback and comments on how to further revise their contributions. We would like to thank Hedorfs Foundation for its support of this workshop. Finally, we wish to acknowledge and thank Agnethe Larsen for her considerable editorial and administrative assistance in completing this book.

Frederiksberg, Denmark

Lydia Bals
Peter D. Ørberg Jensen
Marcus M. Larsen
Torben Pedersen

Contents

Abbreviations

1G	First generation
2G	Second generation
BPO/O	Business Process Outsourcing and Offshoring
BRIC	Brazil, Russia, India, and China
BvDEP	Bureau van Dijk Electronic Publishing
CC	Cluster center
CDI	Cultural Distance Index
CDM	Contract design and manufacturing
CM	Contract manufacturing
CMS	Consumer Management System
COBP	Customer-Oriented Business Processes
CRO	Contract Research Organization
DEA	Data Envelopment Analysis
DMPK	Drug metabolism and pharmacokinetics
DMU	Decision Making Unit
EDGE	Enhanced Data Rates for GSM Evolution
EE	Eastern Europe
EFDI	Expansionary foreign direct investment
EM	Emerging market
EMS	Electronics Manufacturing Services
ETCs	Export Trading Companies
F&I	Financial services and insurance
FDD	Foreign Direct Divestment
FDI	Foreign Direct Investment
GDP	Growth Domestic Product
GE	General Electric
GIN	Global Innovation Network
GLP	Good laboratory practice
GPRS	General Packet Radio Service
GSC	Global Support Center
GTF	Global technology field

IB	International Business
ICT	Information and Communication Technology
IDV	Individualism versus collectivism
INGINEUS	Impacts of Networks, Globalisation, and their Interaction with EU Strategies
IPCC	Intergovernmental Panel on Climate Change
LTO	Long-versus short-term orientation
MAS	Masculinity
MIT	Massachusetts Institute of Technology
NSIDC	National Snow and Ice Data Center
NSN	NokiaSiemens Networks
OI	Offshore intermediaries
ODM	Original Design and Manufacturing
OM	Operations Management
OPs	Operational Purchasers
ORN	Offshoring Research Network
PDI	Power Distance Index
R&D	Research and Development
RBV	Resource-Based View
RFDI	Relocationary foreign direct investment
S&T	Science and Technology
SME	Small to Medium Sized Enterprise
SSDs	Solid State Drives
TCE	Transaction Cost Economics
TCS	Tata Consulting Services
TDSCDMA	Time Division Synchronous Code Division Multiple Access
TIP	Technological Innovation Panel
UAI	Uncertainty avoidance
UMTS	Universal Mobile Telecommunications Systems
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
VIF	Variance Inflation Factor
VLG	Value Leadership Group
WDC	Worldwide Delivery Center
WTO	World Trade Organization

Chapter 1
Exploring Layers of Complexity in Offshoring Research and Practice

Lydia Bals, Peter D. Ørberg Jensen, Marcus M. Larsen and Torben Pedersen

1.1 Introduction

In just a matter of a decade, the Danish healthcare product manufacturer Coloplast underwent a complete organizational reconfiguration from being a local Danish manufacturing company to become a truly multinational corporation. Beginning in 2001, Coloplast commenced the process of relocating major parts of its manufacturing activities away from Denmark to Tatabanya in Hungary. Ten years later, the company had relocated up to almost 90 % of the production mainly to Hungary and China, but also to France and the United States. This reconfiguration had given substantial benefits, such as access to lower labor and production costs, but also an important means to reduce redundant organizational layers and resources. However, a transformation of this caliber rarely comes without challenges. In particular, Coloplast experienced many challenges such as empowering the new subsidiaries, adjusting the organizational requirements and identifying the detrimental organizational complexities. As Coloplast's Operations Manager Allan Rasmussen explained: "We had designed an organizational structure that was too complex, with complex decision processes, complex governance structure, and complex communication channels".

L. Bals (✉) · P. D. Ørberg Jensen · M. M. Larsen · T. Pedersen
Copenhagen Business School, Department of Strategic Management and Globalization, Kilevej 14 2000 Frederiksberg, Denmark
e-mail: lb.smg@cbs.dk

P. D. Ørberg Jensen
e-mail: poe.smg@cbs.dk

M. M. Larsen
e-mail: mml.smg@cbs.dk

T. Pedersen
e-mail: tp.smg@cbs.dk

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Coloplast is just one among many companies that have begun to reconfigure their activities on a global scale. Factors such as the liberalization and integration of the global economy, escalating global competition and ongoing advancements in information and communication technology have led a growing number of companies to increase their scale and scope of offshoring. National and regional differences in economic advantages regarding wages, labor supply, quality and resources have drawn an increasing number of firms to relocate and reconfigure their value chains on a global scale. In contrast to earlier waves of offshoring, companies are today not only offshoring standardized, labor-intensive activities in the pursuit of cost-cutting solutions, but are also relocating knowledge-intensive business activities and services with the purpose of accessing qualified labor, increasing innovation performance and learning.

Despite the progress of offshoring practices, the conceptual understanding of what offshoring encompasses is in many regards underdeveloped. For instance, while some argue that offshoring can be adequately explained by models of comparative advantage under conditions in which value adding activities are physically separable, others hold that recent developments in offshoring have made the phenomenon require new models and theories. Kedia and Mukherjee (2009, p. 251) argue that "The existing conceptualization of offshoring lacks depth, and despite its present and anticipated future growth, many scholars have bemoaned that it has not received adequate systematic research attention." In particular, while we know much about why firms decide to offshore and what the outcomes of offshoring can be, less is known on how firms are actually managing their offshoring activities.

The purpose of this introductory chapter is to address this debate by discussing how offshoring can lead to increased complexity and what the consequences of this may be. To exemplify: Prior Coloplast's offshoring adventure, the company had multiple production plants in close vicinity within Denmark that were all managed and coordinated in an informal manner. "At that time, we had three different plants in Denmark, and they had their own way of documenting things, their own way of analyzing things, and—as an example—their own clean room instructions," Operations Manager Allan Rasmussen could explain. This rather decentralized structure proved sustainable as long as all activities were located near each other as the interdependences with the remaining organization could easily be controlled and coordinated through informal and tacit means. However, as selected parts of the production were moved abroad, the Coloplast management began to realize that the company was facing a number of unexpected challenges, and that an informally coordinated offshoring organization proved insufficient and gave rise to considerable confusion and misunderstandings. In particular, how should the interdependences between the remaining activities in Denmark such as pilot and ramp-up production and the foreign volume production be handled? Similarly, how could production knowledge residing in Denmark effectively be transferred to the Hungarian facilities? The Coloplast management came to recognize that an effective knowledge transfer was impeded by factors such as language and cultural differences, the need for human interaction and training, and expectation misalignments between the Danish and Hungarian workers.

Accordingly, with this chapter we seek to discuss how the implementation of offshoring activities abroad may challenge firms' ability to diligently manage an otherwise concerted organization. Moreover, we also discuss how recent offshoring research is converging towards a 2 × 2 logic of control and location, and rather argue that important value is gained if the locus of research emphasizes offshoring as a larger organizational reconfiguration, in which originally colocated activities become relocated abroad in different governance modes.

1.2 Offshoring: International Relocation

Offshoring can be defined as the international relocation of disaggregated firm value chain activities in captive, collaborative or outsourced governance modes (Contractor et al. 2010; Jahns et al. 2006). Central to this understanding of offshoring is the processual emphasis on the relocation of firm activities from the home country to a foreign location. In fact, offshoring encapsulates three broader organizational processes: the disaggregation of firm value chains into offshorable activities, the relocation of these activities to foreign locations, and the re-integration of the activities into a concerted organizational whole (see also Mudambi and Venzin 2010). First, offshoring entails that firms 'fine-slice' or disaggregate their broader value chains into activities that can be relocated. Driven by the potential of economizing the organizational structure by identifying specific tasks to be offshored, firms consequently break down their value chain activities into a larger number of sub-processes. For example, rather than offshoring production as one discrete activity, firms only often offshore activities such as fabrication, assembly, and maintenance. Second, offshoring describes a relocation of the disaggregated business tasks and activities from the home country to a foreign host location, so that objectives such as access lower cost levels, new resources and markets can be achieved. Third, once the disaggregated activities are relocated, firms need to re-integrate with the remaining organizational activities so that coordinated action may be fulfilled. As such, firms need to ensure that aspects such as knowledge transfer, coordination, and control are not obscured by the geographic, political and institutional distances between the onsite organization and offshoring activities.

Over the last decade, business academics have begun to take a strong interest in the offshoring phenomenon. In fields such as international business and strategic management, recent research has provided rich insights into questions such as which functions firms decide to offshore, which governance modes they choose, where they offshore to, and what outcomes they achieve. In particular, the recent surge in the offshoring of administrative and technical services has lead a number of researchers to scrutinize the phenomenon more closely, as can, for example, be seen in the establishment of the international Offshoring Research Network (ORN) (e.g. Lewin et al. 2009).

The practice of offshoring is not a new phenomenon, however. Western economies have practiced various forms of offshoring over the last 50 years, beginning in the 1960s, when firms, in particular from the U.S., began to relocate blue-collar manufacturing activities to low costs countries, such as Singapore and South Korea. For example, Flextronics, today a leading multinational electronics manufacturing services (EMS) provider based in Singapore, was founded in 1969 in Silicon Valley, California, and established its first foreign manufacturing facilities in Singapore in 1981. In 1990, the company even moved its headquarters to Singapore, and has since succeeded in building a network of manufacturing facilities in 30 countries on four different continents with more than 200,000 employees.[1] Indeed, the recent upsurge in the interest in offshoring has led scholars to emphasize that the practice is not new, and should therefore not be perceived as a unique and modern phenomenon (e.g. Tallman 2010). Leontiades (1971, p. 20), for example, wrote 40 years ago that "soaring wage costs in the industrialized countries raise the prospects of wholesale movements of industrial facilities across national boundaries", and clearly pointed to what we today characterize as offshoring.

However, one important discontinuity in the evolution of offshoring practice is represented by the information and communication technologies revolution, starting in the early 1990s. This has enabled companies to locate digitized business processes almost anywhere in the world. Companies in high-cost economies could begin to rapidly organize and locate activities and processes globally. Increasingly, this meant that firms did not only offshore labor-intensive manufacturing jobs, but also higher value-added activities, such as innovation and product development. Lewin et al. (2009) study the determinants of the small but growing tendency of firms to offshore innovation activities, and argue that this can be explained by an emerging domestic shortage of highly skilled employees in which firms access qualified personnel around the world through offshoring innovation. In many respects, the evolution of offshoring practice has signified a shift from the sole relocation of manufacturing activities to also encapsulate more knowledge-intensive business service activities. Offshoring is growingly being used as an important tool by firms across countries to achieve competitive advantage in a globalizing world. Offshoring as a business practice is therefore no longer only confined to restricted lower-value, labor intensive and peripheral firm activities such as scale production and call-center activities, but essentially encompasses the reallocation of firm tasks and activities from the entire value chain. Contractor et al. (2011, p. 39) summarizes the new offshoring trend:

> The explosive increase in the geographical relocation and reorganization of economic activity in the last two decades is a reflection of (1) necessity (the intensification of competition faced by companies because of globalization and liberalization of trade and investment regimes); and (2) the means to do so (i.e., the precipitous drop in transport,

[1] www.flextronics.com

data transmission, and tariff costs—so that output can be relocated much farther afield from consumers than ever before).

1.3 The Complexities of Offshoring

Firms' decision to engage in offshoring is primarily driven by expectations of lower labor and production costs, but also other factors such access to talent and qualified labor, opportunities to learn, and new markets. Often times, firms find that their expectations to offshoring are fulfilled and in some cases even exceeded. For example, the well-known "went for price, stayed for quality" reference (Dossani and Kenney 2003) captures the case where firms encounter 'positive externalities' of offshoring; namely that certain outcomes, such as higher service quality, exceed or add to initially expected benefits, such as saving labor costs. In this sense, the benefits of offshoring sought after by firms evolve over time (Tate et al. 2009). At the same time, however, many firms have begun to realize that managing an increasingly globally dispersed organization is more difficult and costly than initially expected. Firms may find that the cost of knowledge transfer between offshoring implementations is higher than expected. Firms may also experience that offshoring implementations require substantially more control and coordination than expected. For example, Dell Inc., the multinational IT corporation, decided in 2003 after many problems and challenges regarding cultural differences, language difficulties and time delays to eventually close and source back its Indian service centers that it had offshored and outsourced some years earlier (Graf and Mudambi 2005). Aron and Singh (2005, p. 135) argue that many firms are caught up by the "harsh realities of offshoring" as they fail to pick up the right processes, calculate the operational and structural risks, and match organizational forms to live up to the initial expectations of the offshoring activities.

We contend that a reason for lower offshoring performance than expected can be traced to the complexity of offshoring. In contrast to a company carrying out its entire or the majority of its value chain at home in proximity to its headquarters, a firm that has dispersed a large number of disaggregated value chain parts from multiple internal and external providers in different countries around the world is likely to face higher complexity. Herbert Simon (1962, p. 468) argued that complexity should be understood as systems consisting of "a large number of parts that interact in a non-simple way". Equally, Thompson (1967) portrayed a complex organization as a set of many interdependent parts. Given the growing number of disaggregated organizational tasks and sub-components being relocated globally in the offshoring process, the managerial task of coordinating and integrating a coherent chain of value creating activities and tasks becomes more complex and complicated. This can be seen in the challenge of establishing sound mechanisms for coordinating and integrating a vast range of tasks and activities, dealing with interfaces and interdependences, and overcoming escalating communication costs and barriers.

One example of high complexity in a geographically dispersed organization is represented by the case of the 787 Dreamliner jetliner of the aircraft manufacturer Boeing. In 2004, as the company announced the introduction of the new aircraft, it commenced the onerous task of coordinating the production of a brand new airplane consisting of 2,000,000 parts (in comparison, an automobile consists of roughly 15,000–20,000 parts) with more than 70 % of the production sourced from 900 first, second and third tier suppliers in nine different countries (Tang and Zimmerman 2009). Not surprisingly, this resulted in high complexity in which a high number of disaggregated parts across vast geographies needed to be coordinated and integrated into one concerted organization. Among the consequences of this organizational complexity were the large and unexpected coordination and communication costs required to carry out the project and the continuing postponements of the launch of the completed and final aircraft.

In the following, we outline six central layers of complexity that firms face when engaging in offshoring.

1.3.1 Task Complexity

Recent research has pointed to the fact that firms are increasingly offshoring more complex tasks, such as design, engineering and analytical services (Bunyaratavej et al. 2011; Jensen and Pedersen 2012). There are a number of different task characteristics that can influence the complexity of an offshoring implementation, such as the task's degree of standardized versus tacit knowledge flows, the presence of inexact and unknown means-ends connections, the number and interdependence of subtasks, and the existence of path-goal multiplicity. In comparison with simpler tasks where aspects such as input and output requirements are more easily definable, complex tasks with imprecise and ambiguous requirements are more likely to present firms with growing uncertainties and managerial challenges. However, in view of this type of task complexity, it shows a gap in the literature when the majority of previous research discuss offshoring on the aggregate level without taking the characteristics of the sourced activities into consideration (Doh et al. 2009; Jensen 2012; Mudambi and Tallman 2010).

1.3.2 Structural Complexity

As firms relocate a growing number of activities abroad, new international interdependencies across geographies arise. In contrast to an exclusively collocated organization, a firm that has offshored a number of activities to foreign host locations will experience that the interdependencies between the organizational units become obscured by geographic, political and institutional differences (Stringfellow et al. 2008). Firms will experience informal coordination mechanisms such as face-to-face

coordination become reduced and project teams find it more difficult to build collegial social environments and common ground due to less communication and shared context. As a result, the structural complexity is increased, and firms will need to find alternative way of coordinating the geographically dispersed offshoring activities (Kumar et al. 2009; Vlaar et al. 2008).

1.3.3 Operational Complexity

A result of offshoring is increased operational complexity. Related to the tendency of firms to disaggregate value-adding activities, the process of offshoring often presents companies with a higher number of firm tasks and activities. For example, while research and development might constitute one distinct, integrated value chain activity in a home country context, firms might choose to disaggregate the function into a higher number of more narrowly defined tasks and activities when subjecting them to captive and outsourced offshoring. However, a result of this value chain disaggregation across geographically dispersed locations is a higher number of interdependencies between processes and hence increased operational complexity. The firm needs to coordinate a higher number of activities and interdependences that are dispersed to different countries (Luo et al. 2010; Mol 2007).

1.3.4 Social Complexity

Firms need to manage and coordinate people onsite and offshore. Firms' decision to engage in offshoring may not only provoke internal resistance at home, but also hamper operational efficiency due to lack of trust and face-to-face interaction, status differences between onsite and offshore units, and poor understanding and communication in the process of delivering tasks (Schlosser et al. 2006). In particular, the lack of face-to-face interaction, as well as cultural and language differences between employees at geographically dispersed locations, may increase social complexity in terms of the need for relationship-building between employees (Sidhu and Volberda 2011). Moreover, employees who could previously rely on tacit and informal knowledge transfer mechanisms are now forced to utilize more formalized means of conveying knowledge across borders (Levina and Vaas 2008)

1.3.5 Spatial Complexity

In 1998, John Dunning (2009) called for the inclusion of locational aspects in international business theory development, which spurred a renewed interest in the spatial dimensions of firm activities. More recently, Buckley and Ghauri (2004)

identified the relationship between MNC strategy and economic geography as one of the most important questions in international business. MNCs are increasingly developing into differentiated international or global networks, and by strategic processes of outsourcing or offshoring their activities, MNCs have developed the ability to "fine slice" production and service activities (Buckley 2009; Buckley and Ghauri 2004). As a consequence, MNCs increasingly alter location and internalization decisions for activities which previously could be controlled only internally.

Despite the renewed research interest in the locational dimensions of the firm value chain over the past decades, the various research strands examining the spatial location of firm activities have largely developed independently, with each strand representing "a different interpretation of how the role, nature and importance of location is understood" (Beugelsdijk et al. 2010, p. 485). Economic geography has traditionally examined the spatial location of economic activity, while international business has addressed the organization of business activities across borders (Beugelsdijk et al. 2010). To understand the meaning of spatial factors at a more granular level, we have recently suggested a "fit" perspective as regards the question of what activities are located in which locations, and why. Based on offshoring data from firms located in Denmark, we show how the requirements of the specific activities in question are matched by the factor endowments offered by the host location (Jensen and Pedersen 2011). While an integrative and interdisciplinary approach (Cheng et al. 2009) could bring more clarity in future research, it follows that in their decision on where to (re)locate which activities, managers must take a wide range of complex factors (including the linkages between them) into consideration in order to establish successful offshoring operations (Stringfellow et al. 2008).

1.3.6 Outcome Complexity

Although many contributions in the field have sought to disentangle central questions regarding the outcomes of offshoring, at the levels of society (e.g. Blinder 2006; Gereffi 2006), industry (e.g. Andersen 2006) and the firm (e.g. Gilley and Rasheed 2000), no clear and uniform understanding has yet emerged. Notably Kotabe and co-authors have explored the influence of offshoring—in particular outsourcing to external partners–on the financial performance and competitiveness of the offshoring firm. Nevertheless, there does not seem to be a uniform pattern emerging from these studies as regards the impact of global sourcing on the home firm's financial performance and competitiveness. In fact, Kotabe and Murray (2004) point out that despite the assumed beneficial effects of global sourcing there is no consensus among scholars regarding the firm performance effects.

In several studies Kotabe and co-authors discuss the negative implications and limitations for achieving a successful outcome of global sourcing (e.g. Kotabe 1990; Kotabe et al. 1998), although it is concluded in a study of sourcing from MNCs in the Triad region (US, Europe, Japan) to Chinese strategic alliance partners that at low levels of product innovativeness and technological uncertainty, sourcing to strategic alliance partners is positively related to market performance (Murray et al. 2005). Also, captive offshoring of non-standardized components was found to have a positive influence on the market and financial performance of MNCs (Murray et al. 1995). Most recently, Kotabe et al. (2008) have applied an evolutionary perspective on the relation between offshore outsourcing and the development–respectively destruction–of the sourcing firm's competences. The authors conclude that under certain circumstances outsourcing can spark a vicious cycle that eventually leads to destruction of competences in the home firm which eventually lead the firms to reverse their outsourcing decisions.

Yet, other studies suggest that offshoring of advanced, high-end services may lead to organizational learning and knowledge augmentation in the home firms, and thus benefits the resource stock of the firms (Jensen 2009, 2012).

Such a variety of findings indicates that there is a high level of causal ambiguity between offshoring strategies, offshoring operations and the resulting outcomes in firms. In summary, previous research suggest that the outcomes at the level of the offshoring firm is causally related to situation-specific factors, firm-specific factors (including strategy decisions, and the capabilities and absorbtive capacities of humans and organizations), and industry and country level factors as well as the co-evolution between these determinants. To this already extensive list we may add the ongoing technological developments, concerning e.g. automation, modularization, self-service and customization, and their implications for firm strategies and operations (e.g. Economist 2012; Olsen 2006; Sako 2006).

For scholars, this raises complicated, multi-level questions to analyze. For managers, this creates a complex environment in which to formulate strategies and to operate. We shall turn to some of the strategic aspects in the following.

1.4 Strategic Organizational Design for Offshoring

How do firms respond to situations in which their organizations are becoming growingly complex and subject to a new set of international management and organization challenges? A consequence of complexity is that it becomes increasingly difficult for firms and their decision makers to understand the consequences of relocating and reconfiguring their organizational activities on a global scale. In other words, the complexity of offshoring creates mounting difficulties for decision makers in grasping and anticipating the system behavior and performance effect of the organizational change that the offshoring implementation necessitates (cf. Ethiraj and Levinthal 2004). For example, it is well established that complexity limits the ability of managers to 'rationally' account for 'all'

important decision factors (March and Simon 1958). This has consequences for areas such as information processing demand (Simon 1955) which, in turn, increases the likelihood for decision errors (Levinthal 1997). Complexity also creates organizational inefficiencies and lack of response capacity (Robson et al. 2008). Eventually, research suggests that increased complexity can undermine firm performance (Hitt et al. 1997).

Accordingly, firms that engage in offshoring need to adjust their organization to counter the consequences of offshoring. For example, when activities are co-located, firms might tend not to see the rationale of formalizing organizational mechanisms for coordination since day-to-day problems and challenges can be solved in an informal face-to-face manner. However, as activities become dispersed, firms face increasing uncertainty and coordination challenges, and firms need to respond. In this respect, the principles of modularity may prove to be an important and effective organizational tool. The concept of modularity promotes structures of systems—be it products, production systems or organizations—based on minimized interactions and interdependences between modules and maximized interactions and interdependences within modules. Sanchez and Mahoney (1996, p. 65) define modularity as "a special form of design which intentionally creates a high degree of independence or 'loose coupling' between component designs by standardizing component interface specifications." Modularity thus relies on the concept of loose coupling to describe how firms and firm activities interact with each other within a network. The literature on modularization suggests a number of firm-level advantages through the standardization of the interdependences between the modules, a loose degree of component coupling, and a high level of reconfigurability in technical and organizational design (Brusoni and Prencipe 2006). Companies can, among other things, more easily decouple and disincorporate single modules comprising a system, which subsequently facilitates increased strategic flexibility (Sanchez and Mahoney 1996). Companies are better positioned to identify the value added of each module (as their interfaces are standardized), and they can thus more easily recognize which modules comprise core competencies and which do not (Mikkola 2003). Strategic modularization also reduces the costs managing tacit knowledge in an assembly process of external and internal units (Kotabe et al. 2007). Moreover, companies can experiment with the module and architecture designs to increase the final value of the system (Langlois and Robertson 1992).

This type of organizational form may be relevant for offshoring firms that face increasing complexity: By carefully specifying, standardizing and enforcing the interfaces and interdependences of the globally dispersed activities—i.e. making the offshored activities locally controlled but globally integrated 'black-boxes'—the modular design would ensure that the consequences of complexity are held at bay. By minimizing the interdependences that exist between domestic and foreign activities through mechanisms such as standardization, the need for costly and challenging coordination is reduced. Modularity therefore reduces the impact of complexity by making the offshoring activities increasingly self-reliable.

The case of Maersk Line, the world's largest shipping company, illustrates how a firm might modularize its activities to facilitate offshoring. As part of a cost

reducing strategy, the company decided to offshore its "Purchasing Logistics" department (the department handling purchasing requests from its vessels) from Denmark to the Philippines. In Denmark, the purchasing requests were handled by approximately 20 Operational Purchasers (OPs) sitting in the headquarters in Copenhagen, Denmark, where few of the processes and interfaces with the remaining organization were codified and standardized as the co-location of the activities did not necessitate this. The first step Maersk Line took after having decided to offshore this task to Manila was to hire a project manager with the responsibility for 'tapping' the knowledge of the OPs and to write scripts about how to handle the purchasing request. When the scripts were completed, Maersk Line engaged a few local Philippine programmers onsite in Denmark that would test the scripts and clear up unclear points and bugs from the scripts until they were able to conduct the purchasing request as efficiently as the original OPs. Finally, the whole activity was offshored to Maersk Line's own subsidiary in Manila. Throughout this process, Maersk Line managed to formalize, standardize and specify the interfaces around the activity by defining the boundaries of the tasks being undertaken and minimizing the tacit interdependences to other activities, thus modularizing the processes to be offshored. This way, Maersk Line succeeded in specifying and enforcing the inputs and outputs of the purchasing activity, thus reducing the risk of unintended consequences of complexity to emerge.

In sum, the argument is that modularity may serve as an important means for managing and evaporating the subsequent negative implications of the relative scale and scope of firms' offshoring activities. For a firm to modularize its activities, it needs to specify and minimize the major interdependencies between different activities. Accordingly, the need for coordinating the new and international interdependences that form the complexity of offshoring is reduced. Of course, this is not to suggest modularity as a panacea towards all challenges of offshoring. For example, the costs of modularizing an organization may outweigh the benefits of reducing the need for coordination. Firms also need thorough architectural knowledge on the individual activities and about the ways that the different activities are integrated and linked together in a coherent organizational system. However, the modularity example stresses the importance of thinking about how firms respond and may respond to situations in which the offshoring practice becomes more challenges and less beneficial than originally anticipated. As such, offshoring may increasingly be subject management or organizational innovation—i.e. "the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals" (Birkinshaw et al. 2008, p. 825)—in which existing organizational forms and practices prove inadequate. In this respect, research has pinpointed the transformational potential of offshoring. For example, Maskell et al. (2007) suggest how offshoring to low-cost countries is best described as a learning-by-doing process in which "over a period of time the outsourcing experience lessens the cognitive limitations of decision-makers as to the advantages that can be achieved through outsourcing in low-cost countries: the in-sourcer/vendor may not only offer cost advantages, but also quality improvement and innovation"

(Maskell et al. 2007, p. 239). Equally, based on evolving organizational learning in both home and host country firms, Jensen (2009) propose how offshoring of advanced services should be understood as an antecedent for strategic business development and organizational change.

1.5 Revisiting the Ownership and Location Dimensions in Offshoring

Over the years, many different terminologies have been proposed to describe the process of offshoring, such as international outsourcing, offshore outsourcing, captive offshoring, international sub-contracting, far-shoring, near-shoring, etc. While the different terminologies may point to different aspects of offshoring, such as mode of governance and choice of location, they all point to the process in which firms set up activities in support of domestic or global operations in foreign locations (Contractor et al. 2010; Javalgi et al. 2009; Pyndt and Pedersen 2006; Jahns et al. 2006). More recently, there seems to have emerged as consensus around a 2 × 2 matrix to explain offshoring, with geographic spread on the one axis (domestic vs. foreign) and ownership (internal vs. external) (see Fig. 1.1).

The reliance on this framework has brought much clarity to how offshoring can be understood, in the sense that offshoring describes the move from either of the two domestic quadrants to one of the foreign quadrants. According to this framework, offshoring, as a particular form of internationalization, is conceptually different from, for example, an incremental form of internationalization that emphasizes the accumulation of foreign market knowledge (e.g. Johanson and Vahlne 1977). Offshoring, in contrast, rather signifies a 'sudden' relocation to locations in which the companies may not have prior knowledge. Moreover, while the OLI framework (Dunning 1980) suggests that firms will only internationalize

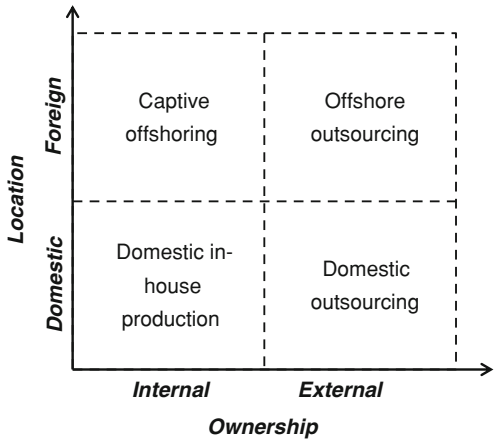

Fig. 1.1 A simple model of offshoring

if it has sufficient ownership advantages, location advantages and internalization advantages, the internationalization of offshoring challenges this view as the relevance of particularly ownership and internalization advantages are less clear (see also Doh 2005). As such, there has been an increasing need to conceptualize offshoring *in contrast* to other forms of internationalization, and the adoption of the '2 × 2' view on offshoring has been proposed to serve this purpose well. Consequently, much offshoring research has been directed towards understanding offshoring as a unique form of internationalization by particularly addressing how different environmental (e.g. macro, institutional, etc.), firm strategy (e.g. efficiency-seeking, market-seeking, resource-seeking, etc.), and organizational (e.g. structure, experience, etc.) factors influence which activities are being offshored (e.g. service, production, R&D), the choice of host location (e.g. domestic or foreign production) and the mode of governance structure (e.g. captive, outsourced, collaborative), as well as performance consequences of this. Accordingly, much research see offshoring as a new phenomenon that requires new theories as the practice breaks with established theories on international expansion and organization researchers (Doh 2005; Kedia and Mukherjee 2009; Mol et al. 2005; Youngdahl and Ramaswamy 2008).

However, despite the simplicity and clarity that this view on offshoring may provide, we argue in line with Mudambi and Tallman (2010) that there are also strong reasons to question the dependency on the 2 × 2 framework. As Tallmann (2010, p. 3) notes: "Convergence on a 2 × 2 matrix of in-house versus outsourced operations and of on- versus off-shore locations has led to a focus on corner solutions that lock discussion into black-and-white considerations of what is happening as opposed to measured concern for the strategic whys, wheres, and hows." To illustrate, as previously argued an essential part of offshoring is the *process* of relocating business activities abroad. However, the focus of the matrix is more directed towards the issues of whether the firm internationalizes or not (location question) and whether this is done internally or externally (ownership question). For example, research may question which activities are more likely to be implemented as captive contra outsourced operations and in which countries this will happen. The flaw of questions like these, however, is that they can to a large extent be explained by established theories on comparative and transaction costs economics: A firm will typically choose the location that yields greatest comparative benefits, and if the transaction costs of relying on outsourcing providers (i.e. market-based solutions) are too large a firm will typically choose a captive (i.e. vertically integrated) governance mode.

In contrast, we propose that it rather makes sense to regard the offshoring phenomenon as an empirical context in which existing theories on international expansion and organizational design can be investigated, extended and modified, but that no completely new theories or conceptualizations are needed. Indeed, research on issues such as coordination and interdependence management has begun to recognize and acknowledge that the recent offshoring phenomenon has a lot to offer to more established organizational design questions. Srikanth and Puranam (2011) find that the new interdependences that arise between the offshore

and onshore tasks as a result going from the onshore to the offshore location have a negative impact on the performance of the offshored process, and that investing in coordination mechanisms has a positive moderating impact on this relationship. In contrast to previous research, however, the authors find that, in addition to coordination mechanisms such as modularity and ongoing communication, investments in tacit coordination mechanisms—i.e. building sufficient common grounds amongst geographically dispersed team members through pre-project familiarity, shared knowledge of each other's work procedures, and visibility of information across locations—have a positive impact on performance. As such, seeing offshoring as an extreme form of organizational reconfiguration, the authors take an important step toward articulating and measuring the distinctive role of tacit coordination mechanisms.

We therefore argue that offshoring can be regarded as a larger organizational reconfiguration affecting a number of dimensions, such the contractual ownership and relationship of the offshoring setup, the geography of the host location, the interdependences and coordination mechanisms between the spatially differentiated organizational tasks and activities, and the overall coherence the globally dispersed organizational system. A generic offshoring process can be split up in two distinct phases: onshore transition and offshore delivery (Dibbern et al. 2008). The onshore transition phase concerns the preparation for moving the activities from the onsite location to the offshore location. Here, the firm would typically invest resources in arranging and specifying how the activities most efficiently can be relocated abroad. The offshore delivery phase, however, concerns the actual implementation and relocation of the activities abroad. Thus, it is from this point in time that the firm realizes the actual costs and benefits of offshoring. As such, while existing theories on e.g. coordination and integration may view the organization in a domestically isolated context, offshoring has the benefit of describing an organization reconfiguration in which disaggregated firm activities become relocated abroad, and would accordingly challenge extant views on issues such as organizational orchestration by emphasizing new distances and complexities.

Another example in which offshoring has the potential to contribute to more established research is within the fields of strategic decision-making. For example, recent research has pointed to the presence of 'hidden costs' in offshoring processes, understood as costs of implementing both captive offshoring and offshore outsourcing implementations that are hidden from managerial attention in decision-making (e.g. Dibbern et al. 2008; Larsen et al. 2012; Stringfellow et al. 2008). Stringfellow et al. (2008, p. 166) argue that "hidden communication-related costs associated with the use of foreign service providers" can eventually undermine the entire rationale of offshoring. In many situations, decision makers are unable to foresee all consequences of offshoring, and are as a result incapable of making precise cost estimations prior to the offshoring implementation. Thus offshoring may serve as important empirical phenomenon to investigate strategic decision-making in organizational change and deviations between expectations prior to the implementation of strategic decisions and actual performance. This may therefore

contribute to an important field of strategic decision-making research that can more accurately clarify unintended consequences of firms' strategic behavior.

We therefore contend that there is much value to be gained—both for researchers and for practitioners—if the research locus moves beyond simpler questions of location and governance modes, and rather focus on how offshoring is actually managed and organized. In particular, we believe there is important value in going beyond the 2×2 dichotomy of offshoring/outsourcing by rather emphasizing offshoring as a larger organizational reconfiguration, in which originally colocated activities become relocated abroad in different governance modes. The organization is then reconfigured on a number of issues such the contractual ownership and relationship of the offshoring setup, the geography of the host location, the interdependences and coordination mechanisms between the spatially differentiated organizational tasks and activities, and the overall coherence the globally dispersed organizational system. Accordingly, the new and added complexities that offshoring entails yield way for a unique empirical phenomenon—almost a natural experiment—that has the potential of appealing to a broader audience, and thus make a more impactful contribution. Offshoring should therefore not only be understood as a simple question of location and ownership, but rather as the reconfiguration of existing value chain activities on a global scale. According to Tallman (2010, p. 6), "If we continue to look at offshoring and outsourcing as unique, isolated, modern phenomena, we will end up as catalogers and scolds, but with little to offer either to practice or, in the end, to scholarship". As such, offshoring should rather be regarded as a phenomenon that has the potential to test, challenge and extend our theoretical and empirical understanding on issues such as international expansion and organizational forms.

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Part I
Offshoring Strategy and Business Models

Chapter 2
Offshoring Activities Impact a Company's Business Model: The Case of BBVA and Banco Santander

Carmen Paz-Aparicio and Joan E. Ricart

Abstract There is an agreement in the literature that an effective business model is a competitive weapon for multinationals. We extend this strategic framework to the offshoring arena by analyzing a change in the business model as a means for coping with the inefficiency trap and reducing complexity management. Most companies start by offshoring simpler tasks and achieve great savings. But, as they become more involved in offshoring, complexity increases and savings decrease. We analyze this by studying two Spanish banks, BBVA and Banco Santander. Findings suggest that the reason and the limit to complexity can be found in the need to change the business model. Results may stimulate future research in other industries and companies from other countries.

Keywords Offshoring · Business model · Effectiveness · Inefficiency trap · Complexity management · Case study

2.1 Introduction

For a long time, the topic of *business models* has dominated management literature and business jargon. However, there is no widely accepted definition of this term's meaning. Practitioners often talk about business models as "the way the firm operates" (Casadesus-Masanell and Ricart 2009). Although this notion seems to be

C. Paz-Aparicio (✉)
Business Management Division, Universidad Carlos III de Madrid, c. Madrid 126, 28903 Getafe, Madrid, Spain
e-mail: carmen.paz@uc3m.es

J. E. Ricart
IESE Business School, University of Navarra, Avda. Pearson 21, 08034 Barcelona, Spain
e-mail: JERicart@iese.edu

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similar to that of strategy, Casadesus-Masanell and Ricart (2010) argue that a *business model* is a reflection of the firm's realized strategy. It refers to the firm's logic, the way it operates and how it creates value for its stakeholders. The same authors define *strategy* as the contingent choice of business model through which the firm will compete in the marketplace.

The chapter seeks to extend this strategic framework to the offshoring arena as a way of dealing with the inefficiency trap. We use this term to refer to the observed phenomenon in which many experienced firms start to fail in the efficiency goals they pursue as they extend offshoring to more complex activities.

There is essentially no consideration of the impact of offshoring activities on the firm's business model. It seems that the factors usually considered are those related exclusively to the individual activity to be offshored, not the impact on the business model as a whole. We address the question of how to avoid the inefficiency trap by understanding the implicit impact on business models. As the strategic management literature has shown, when business models are effective, companies tend to perform better.

There are potential benefits in extending this framework to the offshoring arena. First, it can provide a new, conceptually grounded way of understanding the reasons for deciding to offshore. Second, it can be used to incorporate a contingency view of offshoring according to which another reason for offshoring will revolve around the expected impact of the integration of offshored activities on the business model and how companies can deal with the inefficiency trap. Finally, extending this approach has benefits from a practical perspective. A key challenge for practitioners in multinationals incorporating offshoring is to make the most appropriate decisions to remain competitive within the industry.

The chapter is structured as follows: The Sect. 2.2 explains in detail what a business model is, or what we understand it to be, what the difference is between business model and strategy, and what we mean by an effective business model. In Sect. 2.3, we review the topic of offshoring, analyze its most important drivers for companies and review the activities that are most commonly offshored. We also introduce the concept of inefficiency trap. Section 2.4 discusses *two different ways of integrating offshoring activities with a business model*, radically changing it or not, by describing the cases of two real companies, BBVA and Banco Santander. Section 2.5 provides a summary of *key findings and best practices* learned from the specific cases in the finance industry. To close the chapter, we suggest some recommendations for companies incorporating offshoring and discuss managerial implications and aspects for future research.

2.2 Business Model and Strategy

We all agree that the term business model is more widely used nowadays than almost any other concept in strategy. "When people are asked *what is strategy?* most give an answer that includes the words *business model*", (Baden-Fullen and

Morgan 2010). And this shows that "the terms *business model* and *strategy* are among the most sloppily used in business" (Magretta 2002). In order to have a clear understanding of what the difference is, we provide a concrete definition for each one.

Some academicians think of a business model as "a well-specified system of interdependent structures, activities, and processes that serves as a firm's organizing logic for value creation, for its customers, and for value appropriation, for itself and its partners" (Sorescu et al. 2011), while others define it as "a system of interdependent activities that transcends the focal firm and spans its boundaries" or as "the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities, and a template of how a firm conducts business, how it delivers value to stakeholders and how it links factor and product markets" (Zott and Amit 2010). The same authors think that business model design is a key decision for a new entrepreneur and a crucial and perhaps more difficult task for managers charged with rethinking an old model to prepare their firm for the future (Zott and Amit 2010).

To summarize, the concept of *business model* has been used in the strategy literature to refer to the firm's logic or how the company operates and creates value for its stakeholders (Casadesus-Masanell and Ricart 2010). A business model is a reflection of the firm's realized strategy (Casadesus-Masanell and Ricart 2010), and this is the definition that we will adopt.

Going deeper into the topic, a business model consists of a set of *choices* management makes for how the organization will operate and the set of management *consequences* derived from these choices (Casadesus-Masanell and Ricart 2009). For example, decisions such as where to locate facilities or the extent of vertical integration are considered choices. If we think of pricing policies, as they have implications for sales volume, they are considered a consequence. Because these consequences describe the way the firm operates, they are part of the definition of a business model. Figure 2.1 shows the elements of a business model.

Furthermore, Casadesus-Masanell and Ricart (2009) distinguish between different types of choices (policies, assets, and governance of assets and policies) and consequences (flexible or rigid).

Policies refer to the courses of action the firm adopts for its operation. Locating plants in rural areas or making employees fly economy class in order to reduce costs are two examples. *Assets* refer to tangible resources such as manufacturing facilities. *Governance of assets and policies* refers to the structure of contractual

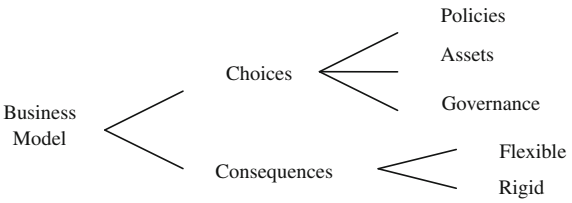

Fig. 2.1 Elements of a business model *Source* Casadesus-Masanell and Ricart (2009)

arrangements that confer decision rights for policies or assets. As an example, a business model may contain as a choice the use of certain assets such as computers. The company may decide to own or lease those computers.

A consequence is *flexible* if it is sensitive to the choices that generate it. For example, "high volume" is a consequence of a policy of low prices. If the policy changes to high prices, volume is likely to fall rapidly. On the other hand, a *rigid* consequence is one that does not change rapidly with the choices that generate it. As an example, corporate culture is a consequence that is very difficult to change.

In most businesses, there are multiple choices and consequences (Casadesus-Masanell and Ricart 2009), which implies that every organization has a business model (Teece 2010). This is because every company makes some choices, and these choices have some consequences. Of course, this does not mean that every business model is satisfactory or even viable in the long run. Different designs have different specific logics of operation and create different value for their stakeholders. So, how can we tell a good business model from a bad one?

The success or failure of a company's business model depends largely on how it interacts with the models of other players in the industry (Casadesus-Masanell and Ricart 2011). However, a preliminary appraisal of a business model's effectiveness can be obtained in isolation by checking the business model's alignment with the organization's goals, the mutual reinforcement or fit among different parts of the business model, the virtuousness or degree of positive feedback generated by the business model and the business model's robustness or ability to face threats to its sustainability (Casadesus-Masanell and Ricart 2011). Then, once in interaction, companies can compete through business models in different ways. For instance, they can strengthen their own virtuous cycles, block or destroy rivals' cycles or build complementarities with them, transforming substitutes into complements (Casadesus-Masanell and Ricart 2011).

Thus, every organization has a business model, but not every organization has a strategy. A competitive strategy explains how you will do better than your rivals, and doing better means being different (Magretta 2002; Porter 1996). When a new model changes the economics of an industry and is difficult to replicate, it can by itself create a strong competitive advantage (Magretta 2002).

"*Strategy* refers to the choice of business model through which the firm will compete in the marketplace" (Casadesus-Masanell and Ricart 2010). It is an action plan for the different contingencies that may arise.[1] Thus, "strategy refers to the *contingent plan* as to what business model to use. Choosing a particular business model means choosing a particular way to compete, a particular logic of the firm and a particular way to operate and create value for the firm's stakeholders. Business models are reflections of the realized strategy" (Casadesus-Masanell and Ricart 2010). Potentially disparate business models may be consistent with a given

[1] The same authors talk about another concept: tactics. This refers to the residual choices that are open to a firm by virtue of the business model it chooses to employ and are crucial in determining the firm's value creation and capture (Casadesus-Masanell and Ricart 2010).

strategy, just as many different paths may lead to the same destination (Sorescu et al. 2011).

Accordingly, the substantive difference between strategy and business model arises when the firm's action plan calls for modifications to the business model when particular contingencies take place (Casadesus-Masanell and Ricart 2010). An analyst outside the company will not observe the incumbent contingent strategy. He will only observe the organization's business model as the reflection of its *realized* strategy. Furthermore, as has been discussed previously, while every organization has some business model, not every organization has a strategy or action plan for the different contingencies that may arise (Casadesus-Masanell and Ricart 2010).

2.3 Offshoring Activities and the Business Model

There is some confusion between the terms outsourcing and offshoring as they are not always used appropriately. For clarification, the reader can see Appendix A. Furthermore, we can also distinguish between two main types of offshoring (Ricart et al. 2010):

- The transfer of blue-collar work (i.e., production), which has been very common for many years as an alternative strategy to reduce costs.
- The transfer of white-collar work (i.e., services), which began much more recently, includes activities with greater added value. This new type of offshoring emerged in the 90s as companies started to move administrative and technical functions (IT, call centers, product development, etc.) abroad to save labor costs and tap into new sources of talented and highly skilled employees (Lewin and Peeters 2006). The offshoring of white-collar functions represents a new type of internationalization. In this chapter, we will focus on this type of offshoring.

Thus, the offshoring of services is becoming "the" critical international economic development issue. In contrast to the relocation of manufacturing jobs overseas, where the affected employees are mainly blue-collar workers, in service offshoring, it is the white-collar workers who are to be displaced (Dossani and Kenney 2007).

An examination of outsourcing and offshoring would suggest cost reduction as a main driver. However, especially in recent years, two other strategy motivators have gained significance: the knowledge-accessing motive and to better understand and exploit foreign markets (Contractor et al. 2010). It is also clear that companies' motives for engaging in offshore outsourcing change over time (Lewin and Couto 2007).

Consistent with these views, the 2009 Offshoring Research Network (ORN) report shows that in the early days of offshoring, much of the growth came from the huge volume of administrative transactions (back-office activities such as

finance, human resources, procurement). These functions have often been sourced from specialized service providers who can perform the task more efficiently and at a lower cost. The report states that more recently, companies have started to look for global sourcing for their innovation services (product design, research and development and engineering services). This is surprising as these services were once viewed as critical competencies that had to be kept in-house. In the same 2009 survey conducted by the ORN, 32 % of the surveyed companies indicated that they offshore at least one administrative activity. This report also shows an interesting difference. When making a decision to offshore administrative services, companies are clearly looking for "cost savings" and "business process redesign". The offshoring of innovation services, however, is driven more by concerns about the need to "enhance capacity for innovation" and increase "organizational flexibility" and "speed to market".

The decision to offshore an activity is complicated. In choosing which processes to relocate, often the most routinized activities are offshored first because of the lower risks of failure (Dossani and Kenney 2007). The disaggregation of the value chain enables companies to make finer allocation choices, for each slice of their value chain. But disaggregation and dispersion of the firm, beyond an optimal degree, also entail more complexity and more costs in terms of added management and communication efforts (Contractor et al. 2010). Moreover, the new wave of offshoring and outsourcing not only includes standardized activities driven by cost savings and involving lower-skilled labor but, as highlighted in many studies (Baden-Fuller et al. 2000; Lewin and Cuoto 2007), also includes more sophisticated and advanced activities such as research, design, engineering and product development (Contractor et al. 2010).

2.3.1 The Offshoring Inefficiency Trap

While cost savings have been discussed by academicians and practitioners, efficiency in offshoring has taken on greater significance in the current worldwide economic crisis. Companies participating in the 2007–2008 ORN survey identified two main factors for enhancing efficiencies. The first involves increased emphasis on business process redesign. The second involves enhancing existing organizational capabilities for managing outsourcing/offshoring strategies. Their findings reveal that in response to the current financial crisis, a significant number of respondent companies plan, or have already taken steps, to increase efficiency by improving coordination and integration of their offshoring processes (Lewin et al. 2009, 2011). This rising concern about efficiency reflects firms' attempts to develop capabilities to overcome the *inefficiency trap*, a common trend among companies conducting offshoring.

The *inefficiency trap* describes a phenomenon in which the first offshoring implementations result in major cost savings, as a result of which the scale and scope of the functions and processes outsourced or offshored are increased.

This growth in offshoring activities is followed by a steady decline in average savings (across all offshored activities). After early successes boost efficiency and add value, more functions are offshored, and various hidden costs become more evident. But few leading companies have been able to back out and escape such a trap. The results of the survey show that as the scale and scope of offshoring increases, low-experience companies discover a need to reflect on the internal capabilities and global competencies needed to manage the coordination and complexity of globally dispersed internal processes, integrating captive and third-party delivery models and functions (Lewin et al. 2011).

Most companies participating in the ORN survey during 2005–2009 are not getting the savings they could possibly achieve. Specifically, in the finance sector, only 5 % of the companies participating in the survey achieved the expected savings in spite of further development of its offshoring activities (ORN Presentation. 2nd Financial Services Roundtable Briefing 2009). This means that all but 5 % of the respondents with sufficient experience in offshoring seem to be caught in the inefficiency trap.

Furthermore, as the scope of offshoring grows and the number of service providers and offshore locations increases, the management of provider selection and oversight becomes much more complicated, forcing companies to acquire and develop the organizational competencies needed to manage and globally coordinate dispersed organizational units (Lewin et al. 2011).

The increased cost of managing and coordinating interdependent activities is denoted as the "hidden" or "invisible" costs of offshoring and stems from the increased need for coordination through the specification of tasks and interfaces among dispersed activities. These costs can be, if not avoided, at least substantially reduced through the selection of proper task interdependence and interface design. The more standardized the interfaces between activities, the less the coordination is needed. These costs are related to the complexity that follows from separating activities and spreading them around the globe (Andersson and Pedersen 2010).

The mechanisms for minimizing hidden costs can be divided into three basic areas: minimization of the use of supervision and management resources, minimization of the need for interunit communication and implementation of high-tech communication solutions (Andersson and Pedersen 2010). Moreover, while coordination of interdependent tasks can be challenging in collocated groups, it is even more so in the case of onshore–offshore teams because of differences in language, culture, institutions, work practices and skills (Cramton 2001 and Mannix et al. 2002 in Sidhu and Volverda 2011).

The ORN data also suggest a growing interest among senior management in offshoring initiatives and developing a corporate-wide strategy for guiding outsourcing–offshoring decisions. The importance of a corporate-wide strategy is further supported by the analysis comparing cost savings achieved before and after implementation of a corporate-wide offshoring strategy. Companies that have adopted offshoring strategies report significantly more savings across all functions (Lewin et al. 2009, 2011).

To summarize, most companies start by offshoring simpler tasks and achieve great savings. But as they become more involved in offshoring, complexity increases and savings decrease. In the end, offshoring results worsen instead of improving. Companies fall into the inefficiency trap because managing complexity decreases the labor cost arbitrage.

We claim that the business model perspective introduced in the previous section can help us understand this phenomenon and the ways to approach it. In the most standard evolution of offshoring activities, companies use the incremental perspective, starting with simple tasks and then offshoring increasingly complex activities. Eventually, the changes introduced reach the boundary of the established business model, and further changes start generating inconsistencies, making it more difficult to spin off virtuous cycles. Faced with these tensions in the business model, firms make effort to simplify the organization and develop new organizational capabilities or better information and governance systems. As reported by Andersson and Pedersen (2010), some firms succeed in these efforts. Others, however, cannot adapt the established business model and fail.

Strategy is the art of anticipation. Some firms decide ex ante to develop new strategic alternatives by creating innovative business models where offshoring is naturally engrained on them; they develop the necessary organizational capabilities and governance systems in anticipation of entering into offshoring. Thus, they first make a strategy move, and change their business model, and only then move into further offshoring. If well designed, they can avoid the inefficiency trap altogether.

To illustrate both types of move, we use as examples two bank groups from Spain: the BBVA and Banco Santander.

2.4 The Case of BBVA and Banco Santander

We begin with the case of BBVA, a Spanish bank. BBVA is a leading multinational financial institution with over 150 years of history. It is currently one of the leaders in the Spanish, Portuguese and Latin American markets. By the end of 2010, it employed 107,000 people, had 7,361 branches in over 37 countries around the world and accounted for 37 million customers. As of December 2009, it had 884,373 shareholders. The BBVA group has five primary business units: Spain and Portugal, Global Services, Mexico, USA and South America.

In 2006, the Operations and Production department received instructions from the top management to reduce expenditure as part of a global strategy to increase bank competitiveness and a new Global Operations Director was named. BBVA's Operations Division employed about 6,000 people, which were providing service mainly to Spain, Mexico, South America and USA. The services were offered locally. The Spanish Division's Operations Department had about 1,000 employees, 90 % working in Madrid and 10 % in Bilbao. This department was the bank's "back office" in Spain and Portugal.

The Global Operations Director created a new operations model, with a Global Operations Division for each region. He wanted not only to reduce costs but also to give autonomy to the different business units, increasing service quality and efficiency.

When deciding to offshore some of its activities, BBVA wanted to keep know-how and process control in-house. For the Spanish business unit, the first regional unit to move into offshoring, the critical activities (30 %) were identified, and for these activities, the bank created a near-shore center in Malaga, wholly owned by BBVA.[2] The other functions, the simpler administrative functions, after the successful move to Malaga, were to be provided by external global partners.

The story of BBVA Spain is therefore quite simple. Starting with "back office" functions, they carry out a process reengineering. This is the most common way of introducing the bank into offshoring. BBVA identified the processes that can be moved onshore and offshore (70 %), and they choose the countries, select a reliable external provider (IBM) and sign a long-term contract. And they are successful in terms of cost reduction, increased efficiency and service quality. Once this is done, they do the same in South America, Mexico and USA. There is no unified system and they work with different providers,[3] but they can share best practices and experiences thanks to the unified dependence of the Global Operations Department.

They also plan to focus on specialization of vendors in order to obtain more synergies, but they need to develop the corresponding capabilities. They have plans to also offshore some of their branch office activities in the short term, but again new learning will be required. Over time, complexity will surely increase. Furthermore, the activities that it is planned to offshore in the near future are very close to the customer and thus very difficult to manage. In order to avoid the trap, the BBVA will need new organizational capabilities and governance structures. At some point, the bank may find it necessary to change its business model and look for other policies, new investments and, most important, new governance modes.[4] If the bank is able to perform these changes, it will avoid the inefficiency trap. If not, BBVA might have to cope with it. We contend that the main sign that the bank is approaching the inefficiency trap is the strain and tensions on the actual business model.

The process followed by BBVA is similar to that used by other firms. According to a report published by The Conference Board and Duke ORN in 2010, the service delivery model that financial services and insurance (F&I) companies have been using for offshoring has evolved. Prior to 2001, 61 % of F&I companies

[2] In fact, 10 % of the processes stayed in Madrid and 20 % finally moved near shore to Malaga.

[3] For the case of the Spanish business unit, IBM is responsible for 90 % of the processes, which are performed in Buenos Aires and Mexico DF, while Indra and Everis manage the other 10 %, from a center in Lima.

[4] In the case of an internal governance mode, the firm owns the foreign entity. In the case of an external governance mode, the firm outsources its activities to a local service provider (Hutzschenreuter et al. 2011).

reported that they initiated offshoring through captive operations. By 2006, most of the large institutions had already built significant captive operations. According to the 2009 Duke University survey (Lewin 2009), only 17 % of F&I companies had opened a captive delivery center in the last two years. Respondents from F&I organizations with captive operations rate "part of a larger global strategy" (83 %) as the number one driver that influenced their offshoring decisions. They also prefer a captive model because it is perceived as a hedge against the "loss of managerial control." But as they become more experienced with offshoring, they tend to diversify their operations and start putting more emphasis on third-party international providers.

Another interesting example of offshoring is the case of Santander Group. Their approach to integrating offshoring activities is completely different from that of BBVA.

Banco Santander started in 1857 as a local financial institution. The bank grew in importance and financial resources over the years. In 1994, it bought Banesto, which reaffirmed the bank's position as the leading player in the Spanish market. Five years later, it merged with Banco Central Hispano—the first major bank merger under the Euro. Expansion continued with acquisitions in Portugal, Brazil, Mexico and Chile, making it the leading financial franchise in Latin America in the year 2000. Abbey (the sixth largest bank in the UK) was purchased in 2004. This acquisition was followed by the purchase of Banco Real in Brazil (2007), allowing it to double its presence in that market. Alliance & Leicester and Bradford & Bingley, both UK banks, were acquired in 2008, and the financial institution became the third largest bank in the UK by deposits. Finally, in 2009, Banco Santander entered the US retail banking market with the acquisition of Sovereign Bank.

Today, Santander has a well-balanced geographic diversification spanning both developed and developing markets. The Group presently has more than 90 million customers, 13,600 branches and over 169,000 employees. In 2009, it reported a net income of 8,943 million Euros, a market capitalization of 95,043 million Euros and asset management above 1,100 billion.

The Santander Group has differentiated itself from its competitors by designing and implementing a unique technological platform and a successful operational and organizational model capable of absorbing the numerous acquisitions without losing control of operations and, at the same time, reducing costs. Thus, Santander changes its business model completely before embarking on offshoring. It changes its technological platform and governance modes; it creates three companies (Isban, Produban and Geoban)[5] where back-office tasks are centralized. Once everything has been moved into these captive factories, offshoring (and outsourcing) is a natural step in managing decentralized activities. Let us look at this in more detail.

[5] And other smaller units not included in this document.

Its technological platform consists of three layers (Ricart et al. 2011). The base, called *Partenón*, is a flexible, modular and expandable transactional system shared by the whole group.[6] This allows rational operations and creation of cross-selling opportunities, improving customers' satisfaction and operational performance. The platform uses a single database so all of the customer's relationships with the bank are automatically linked through a single view. Above the transactional system, there is a "middleware" layer which serves as the baseline for the multi-channel services, such as integrating ATMs, Internet banking, offices. Finally, there is a user layer, called *Alhambra*, which performs typical functions for a consumer management system (CMS) platform, customer service, information integration, etc.

The Santander Group is determined to be recognized as the most efficient bank in the world (Ricart et al. 2011). In order to achieve this goal, it has built a strategy aimed at reducing costs, implementing a strong cost discipline and increasing efficiency through unification and standardization of both processes and technology. The efficiency model implemented emphasizes the importance of three clearly defined dimensions—decrease in costs, control of operational risks and continuous improvement in service quality.

These three dimensions encompass all three levels of the technological support system: technological, operational and organizational. As a result, the system is not only a technological advance but has also become an irreplaceable part of the business model as a whole. Known as the "integrated management of efficiency," this entails coordinating work among the different systems, impacting on all three efficiency dimensions. The common technological platform and organizational model allow Banco Santander to benefit from economies of scale as it is able to transfer key technological aspects, information systems and processes to unified and centralized units.

The Santander's organizational model is characterized by each business unit (a bank, for example) having a Manufacturing Manager, responsible for the unit's technology and operations, while also being a member of the executive team in charge of the business's management. The Manufacturing Manager's main objective would thus be to maximize the bank's value while introducing adequate cost optimization, quality improvements and adequate control of operational risk. Moreover, the work at the individual unit has been further consolidated with that of the corporation, as most of the technology and operations are subcontracted to the group's centralized units (factories): Isban (software development), Produban (data centers) and Geoban (back-office activities).[7] This unification and centralization leads to substantial improvements in efficiency as a result of the effective and successful coordination of the relations between the two entities.

[6] In fact, the actual deployment is not finished yet, but the ultimate objective is the common platform as explained in the text. The same is true for the other layers of the system.

[7] Isban has three global centers in Spain, Brazil and Chile. Produban operates globally from its centers in Spain, Mexico, UK and Brazil. And finally, Geoban provides its back-office activities from centers located in Spain, Portugal, Poland, Mexico, UK, Germany, USA and Argentina.

By means of this technology and operations model, the business units (majority banks) use these centralized factories, with unified policies established at corporate level in the Group, guaranteeing maximum efficiency. This allows the banks to remain in control of their processes, operations and technology, while, at the same time, they can rely on the highly specialized functionality of the centralized units. In essence, the bank outsources execution of these services on a technological level, while, due to the interconnectedness of the central and local units, the process remains within its premises.

The efficiency ratio, used as a principle for measuring operations' efficiency, is the cost-to-income ratio. This measures how much each unit of income costs in operations (the smaller the ratio, the better the efficiency within the unit). However, it is not the only measure that the Group uses to reflect corporate development, as improvements should be achieved by increasing quality without increasing the banking risk. This balance is the key to the bank's future development.

Note that Banco Santander basically decided to change the business model in anticipation of the expected complexities associated with integrating an increasingly large and diverse number of acquisitions. The new business model is designed to benefit from the opportunities provided by its global imprint, including, of course, offshoring/outsourcing.

2.5 Offshoring and the Business Model: Key Findings in Finance Companies

Having described how BBVA and Banco Santander integrate offshoring into their business models, we can summarize by saying that companies may start by offshoring a few simple activities and this is a good way to learn. We saw that while the cost savings from offshoring service work are usually clear, operating at a distance also brings with it certain "invisible costs" (Stringfellow et al. 2008) that managers need to be aware of. Unlike manufacturing, which does not need customer presence during production, some services require customer involvement and the immediate implication for offshoring is how to facilitate this customer involvement in real time and across distance. Furthermore, the most important issue in the service sector is service quality (Stringfellow et al. 2008).

But in the end, complexity will overtake you and complexity costs will increase dramatically. The reason can be found in the need to change the business model. You should anticipate it and prepare yourself. Otherwise, complexity will destroy all arbitrage advantages, unless the organization is mature enough to deal with it. Eventually, the need to adapt the business model requires a change in the strategy and the organization, as well as developing some new capabilities. And the move to a new, innovative business model may require big changes even in the technological platform, as the example of Banco Santander shows.

Essentially, we are describing a process of incremental change that pushes firms to the boundary of their established business models. When increasingly strategic activities are offshored, the overall growth in complexity, with local, onshore and offshore activities, will eventually make it clear that a change in business model is needed. Failure to do so will lead to the inefficiency trap described earlier.

Alternatively, firms can start by radically redefining their business model to adapt it to the arbitrage, scale and learning opportunities associated with the multiple locations of business activities. This has been the risky road taken, for example, by the Santander Group. However, by redesigning the business model beforehand, it has avoided complexities ex post. Or, in other words, complexity has moved to a corporate office where it can be dealt with better than at the operational level.

Not surprisingly, a study conducted by IBM Corporation, based on conversations with 1,500 chief executive officers worldwide, states that CEOs consistently say that coping with change is their most pressing challenge. In 2010, their conversations identified complexity as a primary challenge. But how can CEOs capitalize on complexity? The increasing complexity calls on CEOs and their teams to lead with creativity, connecting with their customers in imaginative ways and designing their operations for speed and flexibility to position their organizations for success. Previously, CEOs only had to recognize the need for business model innovation, but today, they are struggling to find the requisite creative leadership to produce such innovation. To capitalize on complexity, CEOs embody creative leadership, reinvent customer relationships and build operating dexterity (IBM report 2010).

It is our belief that most multinationals have already accumulated some experience in offshoring and outsourcing. They have learned and developed some basic capabilities. As we move forward, we expect most of them to act proactively and develop innovative, novel business models where they can get the full advantage of offshoring and outsourcing as they locate multiple and diverse activities around the globe.

2.6 Conclusion

Offshoring value-chain activities to organizational sites located in other countries has materialized as a business phenomenon of tremendous social and economic significance (Sidhu and Volverda 2011), and it is expected to continue to grow for at least the next two or three years, according to the 2009 ORN survey results (Lewin et al. 2011). Specifically, 57 % of financial services companies, in spite of the economic downturn, indicate that they plan to expand their offshore operations in the next 18–36 months. This is why understanding the offshoring phenomenon and the factors that contribute to increasing effectiveness can help companies make better decisions in the design and location portfolio of their offshored work (Stringfellow et al. 2008). "Companies will discover that offshoring is not so much

about taking costs as it is about enabling them to experiment with radically new ways of doing business" (Lewin and Peeters 2006).

By analyzing the cases of BBVA and Banco Santander, we are able to find some best practices that we hope will help practitioners in the financial services industry. As companies become more involved in offshoring, complexity increases and leads them to the inefficiency trap because managing complexity decreases the labor cost arbitrage. We think that the limit to this complexity is at the business model level and suggest that companies should make effort to simplify the organization and develop new organizational capabilities and governance systems. The key issue here is the need to define and adapt the business model. Moreover, companies will benefit if they are able to predict this potential complexity and ensure that their business model is aligned and consistent (Larsen et al. 2011) before integrating offshoring. And Banco Santander perfectly illustrates this situation. As a result, we see how complexity will increase at the corporate level, requiring substantially more leadership skills and creativity from CEOs and upper-level managers. But is not that better than facing complexity at the operational level? We definitely think so.

The recommendations given in this chapter have limitations. It will be interesting to do the same analysis for companies in other industries and also from different countries (BBVA and Banco Santander are both originally from Spain).

"Transformational outsourcing", which is the new buzzword of the twenty-first century, aims at creating new radical business models that can generate competitive edge for firms and change the rules of the game in their industries (Engardio 2006 in Hätonen and Eriksson 2009). The essence of transformational outsourcing is that where "traditional outsourcing" focuses on sweating assets harder, "strategic outsourcing" aims at acquiring capabilities that the firm is lacking, and "transformational outsourcing" is about changing the paradigm, that is, targeting a new adaptive enterprise (Linder 2004; Linder et al. 2002 and Mazzawi 2002 in Hätonen and Eriksson 2009). So, could not we also talk about "Transformational offshoring" if, as we have said, we need to change (radically or not) our business model if we wish to remain competitive and avoid the inefficiency trap when incorporating offshoring activities?

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Chapter 3
Entrepreneurial Globalization: Lessons From the Offshoring Experiences of European Firms

U. Srinivasa Rangan and Peter Schumacher

Abstract Emerging economies as destinations for offshoring value activities is now a widely recognized fact. Much of the academic writing on this phenomenon focuses on showing how access to low-cost inputs provides an opportunity for firms to compete more profitably. In this paper, we argue that, with the opportunity set for distributing the value activities across the world expanding, internationally oriented firms also enjoy the opportunity to be more entrepreneurial in their strategies. Such entrepreneurial globalization, however, calls for simultaneous changes in multiple aspects of the firm. Drawing on case studies of European firms of different sizes, we show how firms have sought to rethink their businesses from ground up, reconfigure their value chain activities globally, leverage the resources of other firms, create strategic options for their firms, and have improved their competitive position in the market. Such firms may well be in the vanguard of an industrial renaissance in Europe, a continent that has hitherto been less receptive to the use of offshore opportunities offered by emerging economies. We conclude by identifying some implications for managers, policy makers, and academic researchers.

Keywords Offshoring · Globalization · Entrepreneurship · Entrepreneurial globalization · Globally dispersed value chain

U. Srinivasa Rangan (✉)
Babson College, Babson Park, Wellesley, MA 02457, USA
e-mail: rangan@babson.edu

P. Schumacher
Value Leadership Group, Inc, Kastor Building, 20th Floor, Platz der Einheit 1,
Frankfurt am Main 60327, Germany
e-mail: p.schumacher@value-leadership.com

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3.1 Introduction

A new global economic paradigm is taking shape. Offshoring is triggering a broad and fundamental shift in the underlying competitive dynamics of businesses. As the rules of the global competition change, tactical responses would not suffice. Simply responding by cutting costs will not help. Broad, holistic, and strategic responses are needed. Firms have to rethink their value delivery model from the ground up. Such profound changes to processes and organization call for an entrepreneurial approach. In other words, rethinking the business and developing a global value creation/delivery model is critical. Along with it, organizational processes, systems, designs, and structures as well as individual level skills and capabilities may have to change if firms want to do well in the new milieu of entrepreneurial globalization.

3.2 Background and Research Review

The new global economic paradigm we refer to is easily traceable to the growth of offshoring in recent years. The rise of China as a major manufacturing center and the rise of India as a major services center both suggest that value chain activities could be disaggregated and distributed in such a way as to bestow cost advantages on firms willing to compete with a global view of their activities (Dossani and Kenney 2007). Firms in Europe, North America, and, more recently, in Asia and Latin America have begun to take advantage of offshoring.

Many public policy makers and popular economic observers in the West, however, see a darker side to this offshoring boom. The critics suggest that offshoring blunts the long-term competitiveness of firms as value addition tends to migrate to low-wage nations. Initially, China's manufacturing strength was seen as leading to Western manufacturing firms losing out in the new global division of labor. Recently, as India gained prowess in services, critics have become shriller suggesting that high-quality, high-wage jobs would also migrate to low-wage nations. Many opine that Western firms would simply end up as shell companies with little value added in the West.

Among the critics are the Presidents Obama of the United States and Sarkozy of France who have blamed offshoring for loss of jobs in their nations. Commentators like Dobbs (2004) and analysts like Price Waterhouse Coopers of Canada (2004) have argued that offshoring was leading to loss of jobs as well as loss of competitiveness in the Western world. Finally, Nobel Laureate Samuelson of Massachusetts Institute of Technology (MIT) joined the debate in an academic article (2004) where he seemed to imply that, under certain circumstances, globalization of the kind where offshoring plays a major role may actually be detrimental to developed country economies. This seemed to have emboldened the critics of offshoring further.

The response of mainstream economic writers to this barrage of criticism has been threefold. The first is to simply assert that offshoring is here to stay, and it is futile to rail against it (Friedman 2005). While this may be true, it does not really answer the critics. The second is to fall back on free trade theories to suggest that, in the long run, offshoring will increase welfare in both developed and developing nations (Bhagwati 2004). Again, while this may be true, critics may respond, since in the long run we are all dead anyway, why not take policy measures to reduce the social impact of offshoring. The third approach had been to resort to econometric analysis to show that offshoring does not harm wage levels in developed countries (Haskel and Slaughter 2000). Unfortunately, other researchers using similar econometric approaches seemed to find that increased international trade might have worsened wage structures in developed countries (Feenstra and Hanson 1997). In other words, the debate between critics and defenders of offshoring seems to be ending up more as a draw than an outright win for either.

What is missing in this narrative is the ability to trace how offshoring leads to ground-level changes in the economy. By ground-level changes, we mean the destruction, creation, and recreation of enterprises. Students of entrepreneurship recognize that, as market space expands, opportunities for specialization grow (Stigler 1951). With that comes the opportunity for creation of new firms as well as reconstitution of older firms (Schumpeter 1934; Cohan and Rangan 2010). Such "creative destruction" is the driving force behind economic growth. It will be best if academics could demonstrate that such creative destruction is indeed taking place through offshoring. In other words, we need to move from a macroeconomic assessment to a microeconomic understanding to assess the impact of offshoring.

In this chapter, we start with the Schumpeterian notion of entrepreneurial reconstitution of firms. We argue that the best way to look at offshoring is to understand how firms evolve as they respond to global opportunities. Similar to the transformational impact of national level entrepreneurship (GEM 2010), "entrepreneurial globalization" is at the heart of transformational changes occurring in firms first and then in national economies. After pointing out how entrepreneurs redefine the competitive paradigm, we go on to argue that offshoring facilitates the occurrence of entrepreneurial transformation in firms. We elucidate this point through a series of case studies of European firms.

3.3 Entrepreneurship Defined

What is entrepreneurship? Fundamentally, it relates to how opportunity assessment, resources mobilization, and team building (Timmons and Spinelli 2003) come together to create a new enterprise. Moving down from such abstraction, we argue that entrepreneurship consists of five inter-related steps: rethinking an existing business, reconfiguring its value activities, leveraging other firms' resources, creating new strategic options, and developing organizational innovations to create sustainable long-term value.

Perhaps, the best way to illustrate our entrepreneurship paradigm is through a well-known example. Consider the way Jeff Bezos went about transforming the book retailing industry to create Amazon.com, the world's preeminent internet book retailer. Using the new medium of the internet, Bezos was able to rethink the book retailing business. He reasoned correctly that he could use the internet to disaggregate the chain of value activities in retailing. Next came his insight that the value activities could be reconfigured since some activities could be moved from inside his firm to other firms. He identified book wholesaling and book delivery as activities for other firms. This meant leveraging the resources of other firms who had the expertise as well as the asset investment needed to serve Amazon's requirements. Bezos persuaded book wholesalers and book publishers to hold stocks on his behalf. This reduced Amazon's need to invest in large inventories. Bezos asked express delivery firms such as UPS and FedEx to help Amazon deliver on the promise of quick fulfillment of book orders. Such reconfiguration of value activities and leveraging of other firms' resources allowed Amazon to redirect much of its scarce resources toward software and systems development for internet acceptance of orders to fuel rapid growth. As Amazon grew, heavy investments in software and systems development led to the creation of new strategic options for Amazon; Amazon was able to move into retailing of other products that could use the internet-based channel. Finally, as Amazon went about mastering this entrepreneurial approach, the company also was able to create new organizational innovations such as how to forge, structure, and manage strategic partnerships with firms ranging from book publishers through book wholesalers to toy retailers (Wall Street Journal 2006).

Although we have defined and discussed entrepreneurship in the context of a startup like Amazon, it is obvious that the same process with the five steps we described above could happen in an established firm. More and more, large firms are seeking the development of corporate entrepreneurship within their companies as they recognize that corporate rejuvenation is critical for their firms' long-term survival (Thornberry 2006). Indeed, as we show below, offshoring-based globalization has given a further fillip to both the likelihood of and possibility for corporate entrepreneurship.

3.4 Entrepreneurial Globalization

Globalization has put entrepreneurship at the heart of corporations (Yoshino and Rangan 1995). Globalization opens up vast parts of the world for firms to operate in. With access to new places from where needed resources could be obtained, firms can rethink their businesses, reconfigure value activities, leverage other firms' resources, and come up with new organizational innovations. An early exemplar of such entrepreneurial globalization was Nike, the athletic shoes manufacturer.

Until the early 1970s, like many firms, Nike competed through vertical integration across all value activities like research and development, product design, and manufacturing. Senior managers then began to recognize that low-wage countries offered offshoring options, especially in manufacturing. Contrary to the traditional practice of multinationals, Nike opted not to set up its own factories abroad. Instead, it signed outsourcing contracts with local firms. Thus, like Amazon, Nike also rethought the business, reconfigured its value activities, and leveraged other firms' resources. As Nike gained experience with partnerships abroad, it shifted more resources to value activities—product design and marketing—that it had retained in-house to accelerate design and marketing innovations. It thus solidified its top position in the industry. The entrepreneurial globalization of Nike has led to worldwide growth and profitability.

Offshoring is leading to such a fundamental transformation in many industries. Indeed, offshoring holds the promise of such transformation for firms in most industries. In our research, we sought to test this hypothesis by studying four firms in Europe.

3.5 Four European Technology Firms

Our plan for this study emanated from our assessment that offshoring was slower to take off in Europe since there was a lot of apprehension about it. We wanted to study how some companies in Europe, especially in high technology, have dealt with offshoring. Our focus was on high technology since we wanted to see how European firms were doing in a sunrise sector.

3.5.1 Methodology

Our view was that, if we could demonstrate that a wide range of technology-intensive European firms, with all their differences—nationality, size, legal, and institutional—and attendant constraints, have benefited through offshoring, then it would answer the critics better than mere assertions of the benefits of offshoring. And, of course, if we could also show small- and medium-sized enterprises were able to use offshoring as a strategy for international entrepreneurship in the same way as large firms, our argument for entrepreneurial globalization would be further strengthened. These considerations governed our choice of case study sites.

The four firms were from four different European countries: Belgium, France, Germany, and Sweden. They ranged in size from less than 50 employees to more than 800 employees. To be precise, two companies started off as small firms with less than 50 employees although one of them during the period covered by this study grew to be a medium-sized firm with 200 employees. One was a medium-sized firm with about 225 employees which grew into a large firm with more than

650 by the end of the study period. The last one was already a large firm with more than 800 employees at the time of the study. Two of these companies were publicly traded companies and the other two were privately held. Interestingly, despite the differences in nationality, size, stock ownership, and several other firm-level differences, all four firms, after an initial trial-and-error approach, ended up with substantially similar offshore-based strategies along the lines we had delineated and termed entrepreneurial globalization.[1]

We have given below short, thumbnail sketches of the four firms and their offshore approaches to bolster their global strategies. All of them used India as the key offshore center.

3.5.2 DeDuCo, Belgium

Originally founded in 1986 by brothers Carl and Tom Dujardin, DeDuCo started out by selling "clone" PCs to businesses. As the first laptops emerged in the late 1980s, it shifted focus to offer complete business solutions. This called for a dedicated software development team, which DeDuCo started building in Belgium in 1988, and which eventually numbered about 30.

A shortage of skilled programmers began to emerge around 1994. Within a very short period, 18 people—about 60 % of DeDuCo's total development team—had left for better-paying jobs. Carl pointed out: "We had reached a crisis point. Our efforts to recruit more engineers in Belgium were an expensive failure. It was a dead end—if we did not do something drastic we would go out of business." On the verge of collapse, the Dujardins sought radical solutions. In late 1995, they attended an event sponsored by India's National Association of Software Service Companies (NASSCOM) and were introduced to a number of Indian outsourcing firms. A short time later, they started working with a major Indian information technology (IT) services firm. Although there was little trouble initially in building a team with the right skill set, retaining the workers was difficult.

"The outsourcing firm could not stabilize the team, and, within a year, we had decided to move into India on our own," said Carl. Initially, DeDuCo hired a local manager but oversaw the operations from Belgium. As managerial and cultural challenges mounted, Carl and his wife moved to Bangalore to head the operations.

This initial foray was no cakewalk. Dial-up internet connections (the lifeline for any software firm) were slow and unreliable; international phone service was almost unavailable; and simple cultural differences caused a great deal of friction with the remaining workers in Belgium; even leading some of them to sabotage the fledgling operation in India. Despite the odds, perseverance brought its own

[1] The four case studies below were originally done as part of research work funded by the consulting firm Value Leadership Group (VLG) based in Frankfurt, Germany. They have earlier been published as stand-alone case studies by VLG in 2006. See Value Leadership Group (2006).

rewards. By 2006, the company was on a firm footing with 14 employees in Kortrijk, Belgium, and 30 in Bangalore (in a local affiliate named xsysys).

Carl imputed much of his success to the positive attitude of Indian personnel. He felt this was as important as their skills. "Part of the reason for this is material needs. In Belgium, what is there to strive for if you already have a house, a car, and so on? For many in India the sky is the limit. Indians who work hard can achieve in one year more than their parents ever dreamed of. Belgium is like a freight train on a track—people in India are a lot more flexible," asserted Carl.

Offshoring gave Carl Dujardin the chance to virtually rebuild the firm from scratch. The cost advantages left him not only with bigger profits, but also better cash flow and a more solid balance sheet. More critically, the lower cost of doing business offshore turned a small, stable European software developer into an international growth business. The name change from DeDuCo Software Systems India to xsysys technologies was part of the firm's plan to increase its workforce tenfold to 300 and to begin to offer IT services, as well as expand into the US market. According to Carl, this would not have happened if the firm had simply stayed in Belgium.

DeDuCo also reconfigured the value chain. The early stages of DeDuCo's product development—requirements definition and analysis—remained in Belgium, as the engineers there had direct contact with customers and understood their needs better. But low-level design, coding, and testing were successfully moved to India. Once functional requirements were translated into technical requirements, the coding and testing work was relatively straightforward and self-contained. Only when the new product was deployed at the customer was the Belgian team's involvement required again. DeDuCo's global development model (Fig. 3.1) leveraged the relative strengths of developers in Belgium and India to minimize costs as well as time-to-market. True, the firm's development methodology was standard for the industry. What was different was where each of the steps in the process took place, and how they fitted together.

DeDuCo's disbursed value chain also created innovative process capabilities that xsysys could leverage in IT services. The activities, process steps, and capabilities were performed where they created the most value for DeDuCo and its customers.[2] Its global delivery model became a key enabler of the firm's regained competitiveness and improved financial health.

The picture at xsysys in 2006 was vastly different from that of 1996. The Belgian and Indian offices were seamlessly integrated via a virtual private network (VPN). Inexpensive international phone service was widely available. As a significant number of expatriate Indians began returning after working and studying in the West, it helped increase the overall level of professionalism and reduce

[2] DeDuCo's ways of disaggregating the value chain and dispersing it between Belgium and India according to the level of value creation illustrate well the theoretical arguments made along those lines by other researchers [Yoshino and Rangan (1995); Mudambi (2007, 2008)]. What is interesting is that this approach in a service industry follows a similar strategic pattern seen in manufacturing by firms like Nike (Yoffie 1991) and and Acer (Everatt et al. 1999).

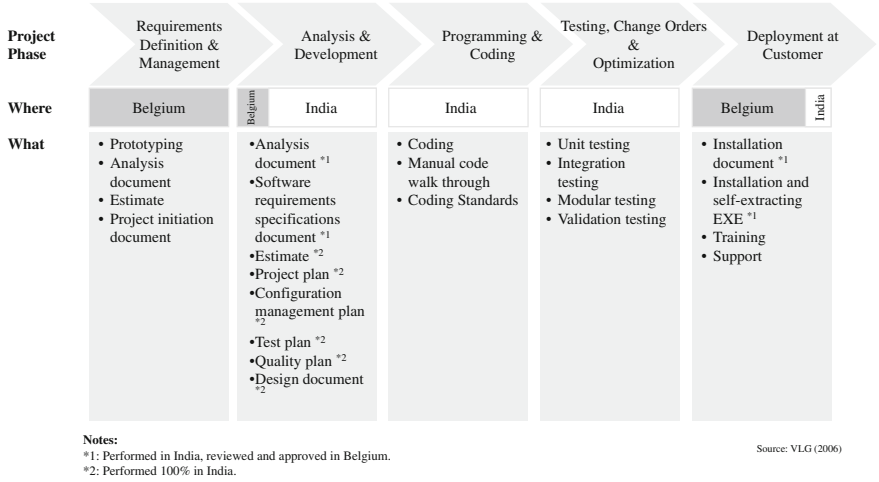

Fig. 3.1 DeDuCo's software development strategy: living the global delivery model (this figure is reproduced with kind permission from Schumacher, VLG © August, 2012)

cultural differences. Carl felt that, in some ways, India in 2006 resembled Belgium in 1996, and "we're losing some people to big companies." But the lower operating costs in India meant that the firm was better prepared to offer competitive salaries, and the xsysys brand also had an impact with the potential workforce in Bangalore that it probably did not have at home.

3.5.3 Telelogic, Sweden

Unlike DeDuCo, which ventured offshore to survive, Telelogic, a provider of tools for advanced system and software development, entered India in April 2001 to sell their products. Based in Malmö, Telelogic originated as a unit of Swedish telecom firm Telia, and had developed tools for analysis, design, and testing of embedded software for telecom switches and other devices. Spun off as an independent firm in 1988, it acquired two firms—QSS (UK) and Continuous (USA)—and began offering solutions, automating the entire process for developing advanced software. It went public in 1999. From a modest beginning with two employees, it grew to a staff strength of 650, divided into three groups: Sales and Marketing, Inside Sales for the US, and the global support center (GSC) in India. At the time of the study, Telelogic had 40 offices in 28 countries with software development laboratories in Malmö, UK, and California.

What started as a product-selling move ended up by giving the firm a different hue! "We came to India simply to tap the market," explained Sidharth Malik, Managing Director of Telelogic India. "But in the process we found there were other things here we could leverage for our operations in Europe and the US."

Over time, the Sales and Marketing began to provide pre-sales support, mentoring, consulting, and training for the subcontinent, including India, Sri Lanka, and Pakistan. Inside Sales worked the night shift in India and called potential buyers in the US. The group identified prospects and passed the information on to the sales force. Doing it from India optimized the use of office space and was less expensive. The GSC, created in late 2002, provided phone- and e-mail-based support to users worldwide and on-site support for customers in India. In 2004, forty per cent of the firm's capacity worldwide for the GSC was in India and, by the end of 2005, India had 50 % of global capacity for the GSC.

In India, the biggest market segment for Telelogic's tools appeared to be with outsourcing giants like Infosys and Wipro, but, as Malik pointed out, these firms would have to use whatever development tools their clients use. "So they'll sometimes use our tools, but they won't standardize on them." Soon, things began to change. Malik recognized that smaller outsourcing firms, those with less than 500 people, needed differentiators. "They can gain significant competitive advantage by using Telelogic tools, which make it easier for them to implement and manage development processes. Our tools help them deliver significant value to their customer in terms of productivity, quality and time-to-market. As these companies grow rapidly, scalable solutions from Telelogic will help them manage the change better." It seemed that the future of the firm kept getting brighter day by day.

Another activity Telelogic India undertook was the handling of Indian operations of US and European multinationals. Malik cited an example: "One of our US customers with a development center here in India had a problem with a new product release, 3 days before the shipping date. They told us they would lose $2.5 million if the release was delayed by the 2–3 days it would take to fix the problem via one of their support options in the US. But, because of our GSC here, we were able to send people onsite to fix the problem in time."

This experience helped Telelogic move away from seeing India as simply a cheaper source of workers. India gave Telelogic a competitive advantage when serving multinationals with critical operations in India. "As a result of our Indian GSC, we get more satisfied customers—and additional revenue—here in India as well as in Europe and the US," concluded Malik.

3.5.4 Valtech, France

The Valtech story is another example of bold entrepreneurial experimentation. It went offshore mainly to achieve scalability and operational flexibility. Valtech wanted to reach a new growth and profitability trajectory that could not be achieved with its old business model. The specter of European IT services industry entering the consolidation phase, partly due to rising competition from offshore service providers, gave the firm its cue for change. Valtech's offshore strategy—and the potential positive impact it might have on the company's valuation—gave

it an opportunity to benefit from future consolidation instead of becoming an acquisition target.

Based in Paris, Valtech was a $100 million firm that developed and implemented advanced IT solutions for corporate clients in Europe, US, and Asia. Founded in 1993, it had grown primarily by acquisitions. At the time of the study, it had about 800 employees worldwide and its clients included the likes of BMW, JP Morgan Chase, and Vodafone.

With so many clients in the West, why the foray into India? As Valtech CEO Jean-Yves Hardy put it, the initial reason for going to India was to centralize development. "We are an international firm with a flat structure—we wanted to do more implementation and maintenance following new engagements. But, we discovered that none of the locations we already had was as good as setting up something from scratch. Our initial idea was not to go offshore, but to centralize development in a world-class location. It's not the traditional cost-cutting story."

"If we didn't have India we would be niche players. We'd have to be the best at Java integration architecture, have the best programmers with the best CVs—we'd just be time and materials consultants with a high-end profile. There's a market for that, but it's not scalable. We are a small listed company, so we have a growth plan that analysts can cover and understand. Niches get you a profit but you stay small and don't exist anymore for the stock market. India allows us to compete directly with the largest IT consultancies in the world," added Hardy.

The biggest challenge Valtech faced was the change in focus that would be needed to get the most out of the offshore strategy. Valtech would have to move away from the work it had specialized in during the dotcom era, such as content management and portal development, and move toward the "back end" of Internet business. As a result, Valtech could transition from time-and-materials consulting to maintenance and services. Valtech Offshore in Bangalore was set up in 2003 following the creation of a joint venture with Indian offshore provider iVega. The iVega venture followed a 2001 partnership with Hexaware in Chennai (later terminated) and was expected to allow Valtech's presence in India to grow to 300 workers by the end of 2004.

Valtech developed its offshore strategy over more than 2 years. During this time, Hardy made a number of trips to India, which formed the foundation of a strategy exploration and development process. This was a time of active learning and listening and an opportunity to ask basic questions and make some early mistakes. Many questions plagued Valtech CEO Hardy. Can we do this as a French company? What are our options? Will the offshore operation help Valtech solve its strategic issues, especially its need for scalability and operational flexibility? Should we partner or build our operation on our own? Who are the potential partners? Where should we locate? What are the risks? What is the legal process for setting up an export unit to qualify for tax credits? What strategic and operational changes will we need to make to the operating model to fully leverage offshore capabilities for competitive advantage?

As the timeline below (Fig. 3.2) shows, once the fundamental strategic direction was set, launching the offshore operation and getting into a growth trajectory

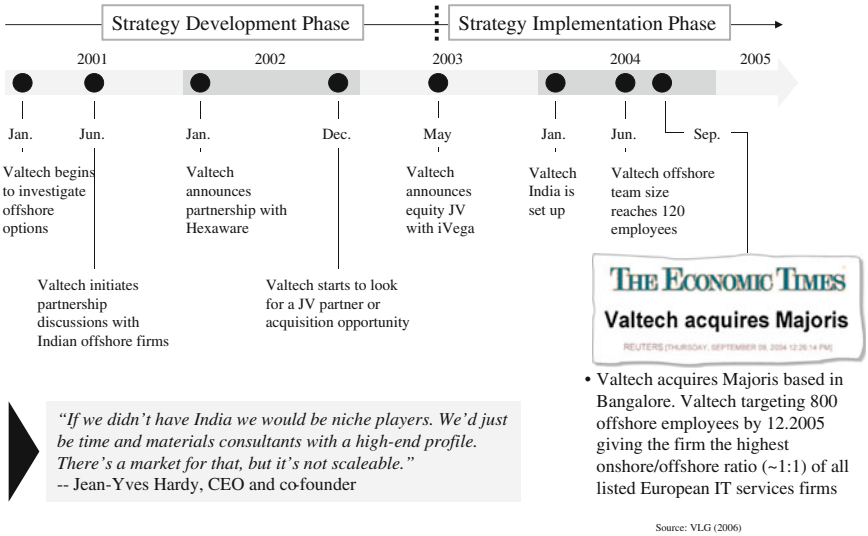

Fig. 3.2 Valtech's timeline: patient strategy development but rapid strategy execution (this figure is reproduced with kind permission from Schumacher, VLG © August, 2012)

quickly was natural and the rapid pace continued thereafter. Hardy understood that the company's offshore strategy needed to achieve more than simply cut labor costs. The global delivery model represents an innovation in process and organization design, and embracing this new way of doing business would require transformational changes to the company's operating and business model.

Hardy also argued that: "The days of consulting with a pen and notebook are gone. In operational consulting you have to come in with a solution or people don't take you seriously anymore." Large multinational IT consulting firms could afford to take this expectation of pre-packaged solutions in stride and dedicate internal development teams to the effort, but smaller firms such as Valtech could not. "We want to leverage offshore for competitive advantage. It's easy to cut costs with administration, business process outsourcing, and so on. The second level is in performing strategic activities at lower cost than the competition," said Hardy.

In Valtech's case, it was by developing pre-packaged solutions offshore. "All our units are still fairly independent due to our inorganic growth," said Rohan Joshi, president of Valtech Offshore in Bangalore, "but there are some obvious opportunities for cross-border co-operation. For example, our biggest customer in Britain is T-Mobile, and in Germany it's Vodafone. Valtech's worldwide delivery center (WDC) in Bangalore will become the glue that holds the firm together—we're getting into global strategies for services we can offer the customer."

Valtech's WDC used what it called an on-site-offshore delivery model to serve customers in all its markets. An on-site team worked with the customer to assess strategy, defined requirements, established project plans, and monitored progress. The bulk of the work thereafter took place offshore—with a single point of contact

between project managers and developers. “We believe that we need to have in front of customers people from the same culture who hide all the differences with India,” said Hardy. “Large Indian IT services firms essentially have Indians everywhere in the world. But we believe that every company has its own type of people, and the way to be global is to add people in different places together.”

While this approach came at a somewhat higher cost than a “pure offshore” delivery model, it minimized the risk to a client, and, at the same time, allowed Valtech to leverage its resources in India worldwide, as shown in Fig. 3.3 below. The opportunities were also apparent for cross-border collaboration between its offices in say, Britain and Germany, because the technical work could be assigned to a single dedicated team in Bangalore, while appropriate local Valtech offices handled client-facing issues.

Interestingly enough, Hardy argued that the greatest competitive advantage Valtech derives from its presence in India was scalability. The relative ease of rapidly finding and hiring large numbers of skilled workers in India compared to Europe gave the company a great degree of credibility when competing for large contracts. Many customers already knew that simply by virtue of having an established presence in India, companies like Valtech could take on far larger projects than would be possible if their operations were restricted to Europe. Underscoring the significance of the offshore location, the Valtech CEO even believed that before long the Indian office would become the company’s de facto headquarters.

With such focus, perseverance, and precision, it was no surprise that Valtech had begun to be short listed for large contracts with European and American multinationals, alongside competitors more than 10 times its size. And many of the new opportunities included maintenance and other activities that provided a smooth revenue stream.

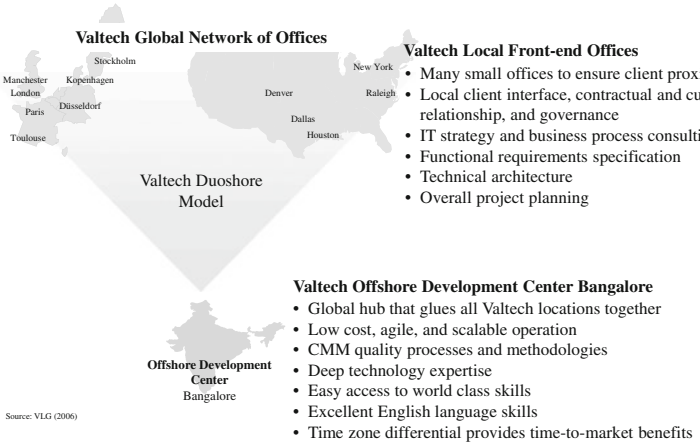

Fig. 3.3 Valtech’s offshore hub in Bangalore: a common global operating platform (this figure is reproduced with kind permission from Schumacher, VLG © August, 2012)

3.5.5 Case Consult, Germany

The twists of fortune are such that, at times, serendipity charts out the course one takes. Case Consult's foray into offshoring is one such instance where the cart came before the horse.

Case Consult was a privately held IT services firm based in Wiesbaden, Germany. It was founded in 1988 and had about 200 workers worldwide; more than half of them were in India. It was the search for scalability that brought Case Consult to India's shores. As a result, the firm was able to take on projects that were unusually large for its size, and counted among its clients a growing number of businesses they would be unable to serve without their offshore presence.

Case Consult's first contact with India came about in 1992 when a German bank contracted it for a major database migration initiative. The bank had already spent several months on the project with a major multinational IT consulting firm, with unsatisfactory results. As a result, the bank was willing to take a chance with a newcomer, even though the project was larger than anything Case Consult had undertaken till then.

Seeking a solution, the Case Consult team visited a firm in Oakland, California, that had successfully undertaken similar database migration. Case Consult found that the global nature of the project was of surprising magnitude: The project leader was Chinese, and much of the heavy lifting was being done by Tata Consultancy Services (TCS) in India. This was at a time when the most efficient way to send data and code to and from India was by courier on a magnetic tape.

Case Consult's initial interest in this early offshore project stemmed from the fact that TCS and its client in Oakland were using the same data conversion tool that it wanted to use on the bank's database. "We'd never heard of India before," recalled Jens Borchers, Case Consult's technical director, "but we asked ourselves if our project could not be done globally as well."

Case Consult decided to subcontract TCS for the assignment. A few months later it established the first direct satellite connection between Germany and India—specifically for the project—which became TCS's largest project in Europe. Remembered Borchers: "At the time, we weren't even aware of the potential cost savings in India. As a result, the project was very profitable—for TCS." The project was a success, and Case Consult, TCS, and the German bank soon started a follow-up project.

The second project did not go smoothly. It fell prey to the drawback common in India: Employee turnover. Said Borchers: "The second project did not go as well as the first because many of the best people at TCS had left as soon as the first project was completed." While Case Consult's initial projects were not all resounding successes, they gave the firm crucial insights into the advantages that India had to offer as well as the potential pitfalls of doing business there.

In January 1995, the company opened its own office in Thiruvananthapuram in Kerala State in South India, with 10 people, making it the first German company to develop software in India. Over the course of the years, it expanded reaching a

staff strength of 120 people in 2005. In Thiruvananthapuram, claimed Borchers, the turnover rate was not as high as in Bangalore. Despite having set shop in India, infrastructure issues continued to plague the company. While India's less-than-dependable power grid meant that backup generators were simply part of everyday life, getting a suitable system installed and working could be a formidable challenge for a small company. But this was just one among the series of unexpected expenses it had to face. One of the first challenges was in getting workers to and from the office. "We ended up setting up our own public transportation system for employees," recalled Borchers, "and today we own three buses for this purpose."

With time, Case Consult's insights and experiences in India translated into significant wins for the firm and its customers. One completed project involved a programming language conversion of several hundred programs for an Austrian financial organization. As Borchers described it: "This project was completed in less than 18 months, a duration that other competitors of significantly larger size—and one which was even already a supplier to the client—had assessed as 'totally impossible'." Despite the fact that it was the first project of that size and the first undertaken using outsourcing, it was successfully completed within budget and within schedule. "This project would never have been possible without the Indian teams," contended Borchers. The client was greatly satisfied.

Said a jubilant Borchers: "We achieve about a 20 % cost savings by being in India, but our clients expect this anyway. But apart from the cost savings the real keys to competing are flexibility and scalability. Even when we were much smaller, we competed directly with large and established IT consultancies. Our presence in India allows us to scale easily for large projects, and makes it affordable for us to maintain a bench to absorb fluctuations in demand."

3.6 The Common Theme: Entrepreneurial Globalization

While the stories of DeDuCo, Telelogic, Valtech, and Case Consult may sound somewhat different, they all have a common theme: entrepreneurial globalization.

In each case, the senior managers had to first rethink the way they were doing business. DeDuCo started off with the need for access to talent but soon recognized the power of the offshore delivery model that allowed the firm to become a global player. Telelogic began with access to local market but soon recognized the power of using India as a global delivery platform. Valtech's journey from an access-for-talent point of view to an integrated worldwide delivery model may have lasted 4 years but what is important to recognize that the company transformed itself into a global player capable of scalability and flexibility. Finally, Case Consult transformed itself from a niche player to one that could routinely play with the big boys in the industry mainly through rethinking the way they do business worldwide using the Indian operations as a lynchpin.

Second, be it DeDuCo, Telelogic, or Valtech, the key lesson each company had learned was one of reconfiguring the value chain activities globally. Witness how

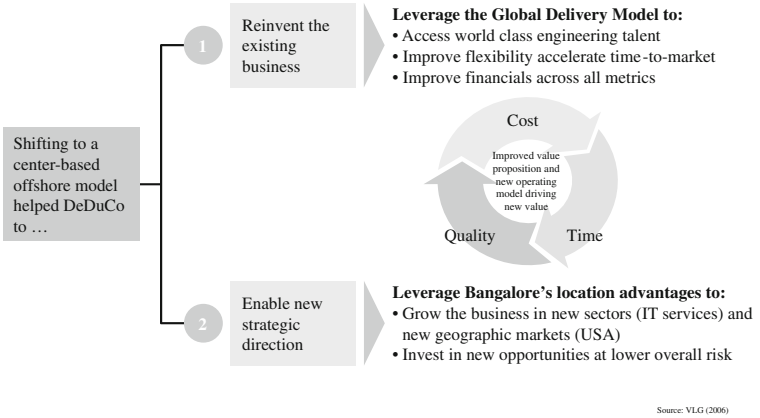

Fig. 3.4 Moving offshore helped DeDuCo reinvent itself and find new growth opportunities (this figure is reproduced with kind permission from Schumacher, VLG © August, 2012)

each of these companies distributed their activities and assets globally to deliver their services seamlessly worldwide.

Third, some of the firms initially relied on other firms' resources to rethink and reconfigure their businesses. DeDuCo started with a local firm doing contract software development for the company. Later, as the firm realized that leveraging others' resources may limit their opportunities, it shifted to locating in-house operations in India. Valtech started off with a joint venture and later shifted to complete ownership.

Fourth, and most important, all these firms did not simply stay strategically the same. Each of them used the opportunity opened up by their Indian operations to create new strategic options for itself. Witness how DeDuCo reinvented itself and found new growth opportunities (Fig. 3.4).

Valtech and Case Consult also moved from being niche players to more aggressive global players thanks to their ability to leverage their operations. In other words, new strategic options were created as well as exercised by these firms.

Finally, each of these firms had to come up with new organizational innovations to make a globally distributed capability model to work effectively. In the case of DeDuCo, one of the founders moved to Bangalore to ensure that the transition to such value activity distribution really worked. Other firms, however, had had to create new organizational processes and systems to make the global delivery model work well.[3]

[3] This need to develop new organizational processes and routines to facilitate better coordination across geographically disbursed value chain activities is a good instance of the important role such conscious development of organizational capabilities play in entrepreneurially reinventing and implementing firm-level strategies. Other researchers have pointed out that such linkage economies (Zollo and Winter 2002; Marrone et al. 2007) permit not only coordination across value activities but also possibly learning and innovation (Mudambi 2008).

Perhaps, the most interesting conclusion to come out of our study of these European firms is how it may make us think differently about the process of globalization itself.

The traditional view of globalization is one of large, established firms seeking to extend their monopolistic advantages to new locations (Caves 1982). Typically, it involved replicating all the value activities in a new country creating completely self-contained units in many countries. It also meant relying largely on one's own resources and not on other firms' resources. Any reliance on other firms is largely through a simple supplier–buyer relationship. As for future growth and strategic evolution, such a view of globalization implies innovations as largely emanating from the center and moving to the periphery. Under such a globalization approach, organizational processes and systems tend to evolve slowly as the multinational firm, given its monopolistic advantages, is under no major pressure to recast itself dramatically to do well in the marketplace.

Contrast this with the entrepreneurial globalization we have outlined in this chapter. Here, the firms do not start off with any monopolistic advantages. Instead, the firms move abroad to create some new advantages. These firms do not create clones of themselves in new countries by doing all value activities in many countries; instead, they distribute activities worldwide as appropriate. Firms globalizing entrepreneurially are not reluctant to rely on other firms' resources as necessary. Indeed, in many such cases, leveraging other firms' resources is perhaps the best way forward for these firms. Moreover, entrepreneurial globalization calls for firms to be open to innovations all over the world. Given the distributed nature of their value activities, these firms develop a willingness to seek, recognize, and exploit new strategic options for growth wherever in the world they find them. Finally, slow-changing, bureaucratic processes and systems are not something that these firms can afford. They need to constantly and frequently adapt their processes and systems to make the global operations work effectively.[4]

We have listed these contrasts in the Table 3.1.

3.7 Managerial, Policy Level, and Research Implications

What are the implications of our research findings? We see them at three levels: managerial, public policy, and academic research.

At the managerial level, the most important insight that this research provides is that the nature of globalization is changing. Slow, bureaucratic way of globalizing

[4] In the authors' assessment, over the last several years, both IBM Global Services and Accenture have transformed themselves into powerhouses in the global IT services industry through an "entrepreneurial globalization" process similar to what we have outlined above. Both firms now have more employees in India than in the United States but their global business reach has grown dramatically during this period. In the global medical systems industry, GE seems to have followed a similar approach (Khanna and Weber 2005).

Table 3.1 Traditional versus entrepreneurial approaches to globalization

	Traditional globalization	Entrepreneurial globalization
View of globalization	Extension of monopolistic advantages to new countries	Rethink the existing business and do it differently globally
Value chain activities	Replication of all or most activities in-house in many countries	Reconfigure value activities and distribute them worldwide partly in-house and partly with other firms
Use of other firms	Maintain control over most activities and use other firms mainly as arm's length suppliers of inputs	Gain leverage through other firms' resources through strategic partnerships
Future growth and strategic evolution	Driven from the center or headquarters and mostly incrementally	Create and exploit strategic options as they occur worldwide because of global configuration of value activities
Organizational processes and systems	Slow to change and the emphasis is mainly on managerial control	Change quickly to suit a more entrepreneurial firm where the emphasis is on customer value

belongs to a bygone era. As prosperity spreads across the world, as human capital accumulates in many countries, as innovations occur in many places in the world (Immelt et al. 2009), and as communications technologies keep improving, more and more firms will follow the path of entrepreneurial globalization we had outlined here. Second, as the center of gravity of global economy inexorably shifts toward Asia, the need respond with a proactive entrepreneurial globalization has acquired urgency in many firms. Third, operating in such a fast-paced and changing global environment may call for a more sophisticated, entrepreneurially oriented, and nimble set of managers than the kind of head office clones that large multinationals have traditionally promoted. In other words, entrepreneurial orientation needs to be imbedded in the managerial culture for firms if they desire to succeed in the new global milieu.

At the public policy level, we find that, contrary to all the hand wringing in the West, the companies that have moved to exploit global sourcing opportunities have not simply been opting for low-cost operations. The companies are more sophisticated than that. They have utilized the opportunity to reinvent themselves strategically, operationally, and organizationally. Global sourcing has led the companies to rejuvenate and grow. This implies that global offshoring/outsourcing may well be the new well spring of entrepreneurial growth and renewal in many developed countries.[5] What is more, such renaissance may well be brought about

[5] This assessment is strongly supported by the success of the Silicon Valley's Apple in recent years. It is now among the most valuable technology companies (WSJ 2012). Much of this success could be attributed to the way it disaggregates the value chain across hundreds of firms across the globe and managing that network flexibly and effectively as narrated in a long and insightful story in the New York Times recently (Duhigg and Bradsher 2012).

by small- and medium-sized firms who are less in the public spotlight and thus may escape the opprobrium that are heaped on large firms. Policy makers in developed countries would do well not to impede this rejuvenation process as it has long-term economy-wide implications. In other words, well-intentioned moves by policy makers to protect jobs in existing industries and firms with carrots and sticks for firms that are seeking to outsource/offshore activities may actually plug the very well-springs of future economic renaissance in Western countries.

As for academic research, we believe that we have only scratched the surface in this new area of globalization. If the entrepreneurial globalization process we have outlined here is more wide-spread and becoming the norm, what are the research implications? We identify here a few research questions.[6] Are some industries more prone to the new globalization process than others? If so, what are the characteristics of such industries? Why are they more susceptible to entrepreneurial globalization than others? If, on the other hand, entrepreneurial globalization is likely to occur in any industry, can we document it? How do established firms in these industries cope with the pressures of entrepreneurial globalization? How do firms find, accept, and adapt to new, globally oriented value activities distribution models? How often do these distributions change? What are the managerial implications of such changes? How do firms change their organizational processes and systems to suit the world of rapid entrepreneurial globalization? What are the implications of these changes in the competitive landscape? How do these changes wrought by entrepreneurial globalization affect customer value migration, speed of adoption of new technologies and processes, business models, and strategies of firms in the West as well in the East?

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[6] The authors of this chapter are working on a long-term research project looking at many of the research questions listed here.

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Chapter 4
Tracking Offshoring and Outsourcing Strategies in Global Supply Chains

Timo Seppälä

Abstract The dynamics in industrial business networks, caused by the disaggregation of firms' value and supply chains, cause product life cycle phases and tasks to be transferred from advanced market economies to emerging market economies. In this chapter, I track the linkages between changes in a lead firm's business environment and changes in the lead firm's strategic offshoring and outsourcing actions; I also track how these changes in the lead firm's behaviour are then translated into a supplier firm's strategy and offshoring decisions. Additionally, I discuss offshoring and outsourcing strategies in global value chains. The increasing level of highly skilled labour in emerging market economies enables industrial business networks to rearrange themselves along with shorter life cycles. Furthermore, I find that different firms typically react to their customers' strategies with the same approach but implement and schedule their implementation in different ways. These differences in the execution and implementation patterns of offshoring and outsourcing also differ among industries.

Keywords Global value chains · Offshoring · Outsourcing · Industrial business networks

Globalisation is much more than simply moving employment and activities from developed nations into nations with lower-cost forces. Such a simple conclusion obscures the complicated skein of cross-border relationships that have evolved out of firm strategies seeking to balance the kaleidoscope of variable including labour and inventory costs, transportation, quality, concentration of valuable knowledge in clusters and temporal proximity to customers. Understanding firm strategies at the single moment in time is complicated enough, but unfortunately, these variables also fluctuate (Kenney and Florida 2004, p 1).

T. Seppälä (✉)
ETLA, The Research Institute of the Finnish Economy, Lönnrotinkatu 4B,
00120 Helsinki, Finland
e-mail: timo.seppala@etla.fi

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4.1 Introduction

The disaggregation of a firm's value and supply chains has accelerated in the past decade, especially among global high-tech firms. Other firms in other industries appear to be following this trend. This disaggregation of firms' value and supply chains has caused different product life cycle phases and tasks to be transferred away from advanced market economies to several different locations around the world and among emerging market economies (Blinder 2007; Mudambi 2008). However, the product life cycle phases and tasks contributing most of the value and the control of global value and supply chains have continued to remain in advanced market economies (Ali-Yrkkö 2010; Ali-Yrkkö et al. 2011). Nevertheless, there is increasing concern that these high-value product life cycle phases and tasks will be offshored as well. Offshoring entails the moving away of not only tangible assets but also intangible assets, especially those related to commoditised technologies (Ali-Yrkkö and Seppälä 2012 forthcoming).

Grossmann and Rossi-Hansberg (2008) approach this same disaggregation of firm value and supply chain from the international trade theory perspective by separating trade in tasks from trade in goods. Baldwin's approach (2006, 2009) moves to a finer resolution level and discusses unbundled value and supply chains. This division of international trade into trade in tasks and trade in goods and the unbundling of global value and supply chains mirrors the current working environments of any multinational enterprise, hereafter referred to as an MNE (Linden et al. 2009; Ali-Yrkkö et al. 2011). These two approaches represent the prevailing perspectives regarding global value and supply chains. However, there are many other perspectives (see Porter 1995; Baldwin and Venables 2011).

Managing offshoring and outsourcing strategies for global value and supply chains has been recognised by several authors (see Dunning 1993, 1998; Pyndt and Pedersen 2006). In this chapter, I extend the existing literature not by tracking a single firm's offshoring and outsourcing strategies and behaviour, a single moment of time; instead, I follow the causes and effects of a lead firm's behaviour in the context of disaggregated global supply chains in a longitudinal study. By tracking the offshoring and outsourcing strategies in high-tech global supply chains and their respective industrial supplier networks between 2000 and 2010, I am able to answer the following research question:

> How have offshoring and outsourcing advanced in global high-tech business networks and supply chains?

I track changes between 2000 and 2010 in the following characteristics of lead firms: (1) business environment; (2) offshoring and outsourcing strategies; (3) operational structures and (4) industrial supplier networks. This approach enables me to analyse the linkages between changes in a lead firm's business environment and the lead firm's strategic offshoring and outsourcing decisions and then to observe how these changes in the lead firm's behaviour are translated into a supplier firm's strategy and corresponding decisions regarding offshoring and

outsourcing contexts. Furthermore, I explain how different technology and service-based firms in industrial supplier networks have executed their offshoring and outsourcing strategies and relocated different product life cycle phases and tasks, such as research & development, production and after-sales services from advanced market economies to emerging market economies.

In this chapter, I use a case study methodology to examine the contemporary phenomenon of offshoring and outsourcing in high-tech business networks and supply chains, and I use the multi-case approach to capture differences in firms' behaviour (Eisenhardt 1989; Yin 1994). Furthermore, the multi-case approach is then supplemented with 14 interviews with industry experts, current and former representatives of mobile telecommunications industry. All interviews were conducted between August 2010 and May 2011.

The reminder of this chapter is structured as follows. The next section introduces the analytical framework, that is, industry dynamics, new emerging markets, global value chains and offshoring versus outsourcing, paying particular attention to ascendant definitions. The research context and the methodology are described in section three. The transformation of the mobile telecommunications industry business networks is then explained in detail in section four. The main results, a comparison to transformations in business networks within the mobile phone industry and conclusions, conclude the chapter.

4.2 Analytical Framework

Each industry, each global supply chain and its respective industry supplier networks evolve at different rates of speed depending on changes in business environments, global operational structures and product life cycles (see Fine 1998; Funk 2004; Doz and Kosonen 2008). High tech, for instance, is one of the fastest evolving industries today. Its products can have technology life cycles measured in tens of years. However, the most striking difference among all of the industries is the timeframe available for making decisions (Fine 1998; Eisenhardt 1989).

Fine (1998) argues that each firm has its own position in terms of industry dynamics; these positions typically vary between firms. In each firm, the status varies between being horizontally integrated and vertically integrated. By analysing its business environment, a firm can define its own and its competitors' positions. Along with the analyses of industry dynamics, a co-evolutionary model towards competitors' sharing of industrial supplier networks has emerged (Sturgeon and Lee 2001; Möller and Rajala 2007). Industrial supplier networks in Asia, especially in China and India, have been the dominant factor behind this change in industrial network structures (Seppälä 2010, 2012). This change among global value and supply chains has shifted from transferring only tangible assets to transferring intangibles as well (Mudambi 2008).

The concept of global value chains is typically used to analyse the value added by a firm in a global industry and in its global value chain from "mines" to

"consumers" (Ali-Yrkkö 2010; Ali-Yrkkö et al. 2011). Furthermore, the concept of global value chains can be used to examine and analyse a firm's global strategy and position compared with others within its industry business network. Kogut and Kulatilaka (1984) and Porter (1995) originally designed the value chain framework to examine organisation-level or firm-level production and supporting value creation processes and the contributions of these towards developing a competitive advantage. Kogut and Kulatilaka (1984) argue the following:

> Global strategies succeed by creating certain economies along and between value added chains i.e., each firm creates its own value added chain, and by designing marketing programs that adapt products to national needs and yet exploit these in upstream economies.

However, both Kogut and Kulatilaka (1984) and Porter (1995) base their value chain frameworks and analyses on the notion that value as such is often created by activities within the firm, which then vary considerably between firms. Pyndt and Pedersen (2006) extend that by considering that the firm's ability to affect other companies in the value chain may constitute a critical source of competitive advantage. This finding confirms the importance of investigating entire value and supply chains rather than focusing on a single firm.

Mudambi (2008) offers a framework that combines several of the above contributions. He identifies three different global value chain management/business models; integrated, semi-integrated and low cost. An integrated global value chain management/business model represents cases in which an MNE controls the value throughout the product life cycle, including the intellectual property and technology (often customised) rights. A semi-integrated global value chain management/business model represents cases in which the MNE controls design and markets for the product, minimising outsourcing and its control of intellectual property and technology rights. The actual production processes are often offshored and outsourced as well, which means that under this global value chain management/business model, the intellectual property and other rights can also be contractually outsourced. The low cost business model is, in this case, regional not global. In many ways, this global value chain management/business model is very similar to an integrated way of thinking. Under this model, the component supplier tends to own the intellectual property and other similar rights. Often, these technologies are also mature technologies from a technology life cycle perspective.

In addition to discussion on industrial dynamics, global value chains and the disaggregation of global value chains, it is important to recognise the systematic knowledge transfer catch-up effect between advanced market economies and emerging market economies (Mudambi 2008). This knowledge transfer—catch-up effect acts to balance inequalities between the economies. This knowledge transfer—catch-up behaviour can be identified from the decisions of Finnish MNEs in the period from early 2000 to 2011 (Ali-Yrkkö and Tahvanainen 2009).

Dunning (1993, 1998) considers that there are four motivational factors behind strategic decisions of the firm while planning for offshoring and outsourcing strategies: is a firm (1) a market-seeking firm, supplying goods to that market;

(2) a resource-seeking firm, looking for cost benefits; (3) an efficiency-seeking firm, looking for cost advantages or (4) exploring these options as a strategic consideration; for example, aiming to follow its customers and/or competitors? As mentioned earlier, these four motivational factors represent the key decision-making criteria of each firm.

Offshoring and outsourcing are typically treated as firms' strategies that need to be simultaneously understood (Contractor et al. 2010). Furthermore, Contractor et al. (2010) consider outsourcing and offshoring to be the two outcomes of the same strategic drivers that force firms to make new strategic decisions in terms of where to relocate research & development, industrialisation, production and after-sales service-related tasks. However, there exist opposing views as well. Therefore, the optimal position of each MNE in its disaggregated global value and supply chain is to be carefully analysed to understand firms' strategic decisions in this context while observing the role of transaction cost economics.

Contractor et al. (2010) consider that each firm has six different options for each value and supply chain task and/or activity. Firms typically operate domestically and/or externally in a foreign country. Simply put, offshoring entails moving jobs, task and/or activities out of a firm's home country (Blinder 2007). In contrast, outsourcing can happen in-house, cooperatively with another firm and/or through a market transaction through a partnership and/or any supplier. Today, in many cases, outsourcing occurs as offshoring. This elaborated view of offshoring and outsourcing builds on several studies such as those by Grossman and Helpman (2002) and Pyndt and Pedersen (2006).

Fill and Visser (2000) discuss about the principal factors and drivers associated with the decisions related to the outsourcing spectrum. The outsourcing spectrum offers a framework of outsourcing tasks from relieving capacity overload to a variety of strategic partnerships supplying predetermined, assembly, products or services. Drivers related to outsourcing occur more in the form of decision-making tools to support actual decision making and enabling the quantitative comparison of firms. Mudambi and Tallman (2010) describe the outsourcing spectrum as a make, buy or ally process occurring between firms that include the transfer of tangible assets, including some knowledge intensiveness related to production and innovations, that is, some degree of specific capabilities of the firm.

In the mobile telecommunications industry, outsourcing goes beyond Mudambi and Tallman's (2010) definition, especially when considering commoditised technologies (Seppälä 2010). In relation to the above, Greenstein (2005) discusses different business models of outsourcing, such as contract manufacturing (CM), contract design and manufacturing (CDM) and original design and manufacturing (ODM), all of which are relevant to mobile infrastructure industry. The developments in mobile telecommunications industry continue to follow the development patterns of the personal computer industry, where a Taiwanese ODMs deliver most of the world's personal computers.

4.3 Research Context

Developments in the mobile telecommunication industry can be divided into four distinct eras. The first-generation (1G) cellular systems, deployed in the 1980s, represented the simplest communication networks. The second-generation (2G) cellular systems were the first to apply digital transmission technologies for voice and data communication. To address the poor data transmission rates of the 2G network, technological enhancements called 2.5G technologies such as general packet radio service (GPRS) and 2.75G Enhanced Data Rates for GSM Evolution (EDGE) were developed. 3G networks are also referred to as universal mobile telecommunications systems (UMTS). However, China has developed its own standard, called time division synchronous code division multiple access (TD-SCDMA). As of today, the wireless networks are evolving from 3G to 4G architectures, which then provide a platform for the all-IP convergence of mobile and fixed networks, which in turn gradually leads to non-IP networks. These continual changes in technology have resulted in the increasing complexity of business environments as well as enhanced business and earning models of individual firms.

The increases in the number of mobile telecommunication infrastructure investments, especially in new market economies, have been another key factor behind recent developments in the mobile telecommunication industry and its technologies. These developments continue today. Figure 4.1 shows how the market focus has been shifting away from advanced economies to new market economies as well as the development in mobile subscriptions from 2000 to 2011. These two major developments have driven many companies to make decisions related to strategies and operations, especially those concerning the disaggregation of their value and supply chains to match market requirements.

4.3.1 Methodology

I use a case study methodology to examine the following question: *How have offshoring and outsourcing advanced in global high-tech business networks and supply chains?* I thus use the multi-case approach to capture differences in firm behaviour supplemented with 14 qualitative interviews (Eisenhardt 1989; Yin 1994). Interviews were conducted between August 2010 and May 2011 with industry experts and current and former representatives of the mobile telecommunications industry. Each interview lasted for two to four hours. The interviews focussed on four major topics: (1) tracking key changes in the business environment; (2) tracking changes in strategies and how they were communicated to the suppliers; (3) tracking changes in supplier networks and (4) tracking how different suppliers reacted to the changes. The interviews were followed by telephone calls and emails to ascertain and confirm case data. Furthermore, a multi-case approach,

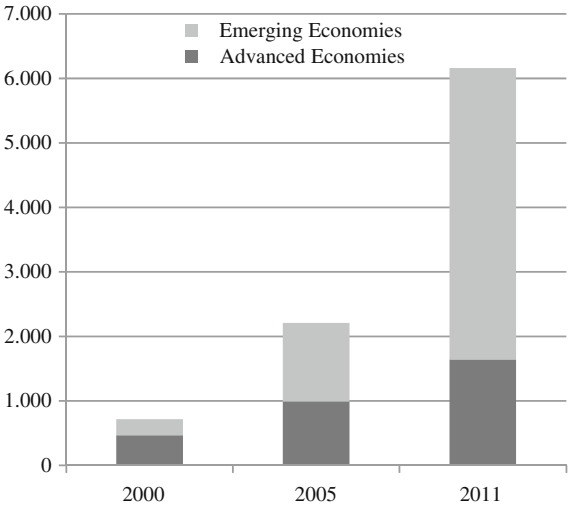

Fig. 4.1 Mobile phone subscriptions—advanced economies versus emerging economies (*Source* ITU statistics)

together with supplemented interviews, including a cross-case analysis, provides a richer and deeper understanding of micro-level processes of offshoring and outsourcing in the context of specific industry networks.

In my multi-case approach, I focus on describing changes in Nokia Networks, later nokia siemens networks (NSN), a Finnish telecommunications infrastructure business network, from 2000 to 2010 in terms of its (1) business environment; (2) offshoring and outsourcing strategies; (3) operational structures and (4) supplier network. The supplier networks perspective includes such firms as Efore, Alteams, Scanfil, Elcoteq and Incap. All of these firms have different and lengthy histories with NSN. The case firms were selected by direct contact with key personnel and requesting their participation. However, I wanted to ensure that there is a reasonable variance between the firms' strategic and operational processes. Therefore, I make reference to earlier studies and to recent changes in the industry networks' setting indicating that the emerging economies will continue to play an important role while considering new offshoring and outsourcing locations for research & development, production and after-sales services-related tasks.

4.4 Empirical Analysis

4.4.1 Increasing Complexity of the Business Environment

The competitive landscape of the mobile telecommunications infrastructure industry has been shifting away from a traditional hardware and software landscape to more of hardware, software and service landscape. This shift, together with technological changes within the mobile infrastructure industry, has rapidly

Table 4.1 The shift in competition in all Nokia Networks/Nokia Siemens Networks among all business areas

2000	2005	2010
Alcatel	Alcatel	Lucent-alcatel
Ericsson	Ericsson	Ericsson, Huawei
Motorola	Motorola	ZTE
Nortel	Nortel	NEC
Siemens	Siemens	Cisco
	Huawei	IBM
	Lucent	HP
	NEC	Accenture
	Cisco	Amdocs
	Juniper networks	Oracle
	IBM	
	HP	
	Accenture	

Source Nokia 20-F reports 2000–2010
Nokia Siemens Networks combines Nokia's Networks Business Group and the carrier-related businesses of Siemens Communications. In 2011, Nokia Siemens Networks completed the acquisition of certain parts of Motorola.

altered the nature of competition and firms' strategies, moving the firms towards new unknown (Bettis and Hitt 1995). Furthermore, new competition has emerged through new incremental technologies. It is meant to represent an increase in new competition for not only traditional hardware and software suppliers but also other players in a value chain, such as telecommunications operators.[1] Table 4.1 demonstrates change in the competitive landscape in the mobile infrastructure industry between 2000 and 2010 from the perspective of Nokia (Nokia Networks and Nokia Siemens Network), which can be considered one of the key players in the industry.

Therefore, the competitive landscape has been changing; for example, countries such as China have been offering incentives, such as tax incentives, for MNEs to continue to transfer operations from advanced economies to emerging economies. These initiatives, in addition to getting new business (i.e. new contracts), have been the main reason for MNEs' leading their supplier networks to move their operations as well.

This trend towards horizontal integration in the mobile infrastructure industry landscape seems to continue until the next disruptive technologies are launched. The next such disruptive technologies that could change the competitive landscape of the existing MNEs could be in the area of photonic switching (see Reiley and Sasian 1997) and/or quantum computing (see Williams 2011) technologies. These technologies will be made publicly available in the next ten to fifty years.

[1] Nokia Capital Markets Day—Simon Beresford-Wiley, 28.11.2006 (Source: www.nokia.com).

4.4.2 Changes in Global Operational Structures

MNEs engage in foreign direct investments (FDI) and own or in some way control value-added activities in more than one country (Dunning and Lundan 2008). These value-added activities refer to value chain frameworks by Kogut and Kulatilaka (1984) and Porter (1995) as well as Baldwin and Venables (2011) created to examine organisation-, firm- and global supply chain-level value-added activities and their contributions towards developing greater value contribution by any advanced and/or emerging economy. Another consideration of value-added activities is made by Baldwin (2006, 2009), who divides international trade into two separate flows of trade: trade in goods and trade in tasks.

In the case of the Nokia Networks Business Group and later Nokia Siemens Networks, the firms' internal value-added activities, that is, different operations of the firm, have been distributed worldwide. Prior to the merger of Nokia Networks Business Group and carrier-related businesses of the Siemens Communications Nokia Networks Business group, research & development (R&D) operated in four countries in several geographical locations. Following the merger, R&D operations expanded to three new countries, Greece, Germany and Poland. Today, Nokia Siemens Networks has R&D operations in nine countries providing value-added services to the rest of the Nokia Siemens Networks operations around the world. The piloting and industrialisation of the products were separated from the main research and development activities.

The number of production facilities has varied significantly. Typically, these types of changes in numbers are related to their proximity to the final customer, to mergers and acquisitions activities and to outsourcing agreements. Table 4.2 presents the changes in numbers and also changes in geographical locations. According to Nokia's 20-F reports from 2006 to 2007, Nokia increased the number of its production facilities in China. This increase occurred because Siemens were forced to reclaim a plant in Shanghai, due to the Siemens earlier agreements with BenQ, a Taiwanese firm. The changes in a need of an additional capacity are visible in Table 4.2, which explains how much additional production capacity has been contracted to EMS. Typically, these same partners also manage after-sales services.

Table 4.2 Nokia Networks, Nokia Siemens Networks production and supply chain management from 2000 to 2010 (*Source* Nokia 20-F reports 2000–2010)

2000	2004	2007	2010
12 plants	*5 plants*	*9 plants*	*8 plants*
5 in Finland	3 in Finland;	2 in Finland;	1 in Finland;
1 in United Kingdom	2 in China	3 in China;	3 in China;
5 in China		1 in India;	2 in India;
1 in Malaysia		3 in Germany	2 in Germany
Outsourced > 60 %	Outsourced > 50 %	Outsourced > 20 %	Outsourced > 29 %

Indeed, strategic and operational agility become a necessity when these changes in the global business environment and respective operational structures are shared and communicated to the global supplier networks. Gaining a strong strategic and operational commitment from the global supplier networks is a must. Gained commitment then enables the whole supply chain to adapt changes in a more agile way as required by the business environment and global operational structures.

4.4.3 Communicating Change to Suppliers

Nokia Networks, currently Nokia Siemens Networks, typically communicated its new goals and respective performance targets related to changes in the business environment and in its global operational structures well in advance, so that the supplier had time to plan and execute these new goals and respective performance targets.

> Typically, Nokia Sourcing Organisation communicated the targets four years in advance. This means that 2004 targets were communicated in 2000; 2005 targets were communicated in 2001 etc. … a good example of such communication is that in 2006 low cost production targets were communicated meaning that 80 % of production needs to be in low cost locations by 2010 (A former Elcoteq employee).

Sometimes, there was sufficient time to effect these requested changes, but sometimes, there was not.

> I remember an occasion in 2002 that they asked us to shift more production towards China in the area of PCBAs, but also provided us a target of localising 80 % of the components value by 2005 … some such transfers were made only because of the target, but no real need. In some cases the production transfers from higher cost production location to lower-cost production location did not cause any cost benefits (A former Aspocomp employee).

According to Doz and Kosonen (2008), this systematic way of planning strategic and operational changed jointly with its supply chain, which began at Nokia during the period from 1993 to 1997. Later on, between 1998 and 2004, the systematic planning process was called strategic sensitivity and enhancing resource fluidity (Doz and Kosonen 2008).

Nokia Networks' acquisition of Siemens brought some problems for Nokia Networks in that communication, as Siemens used different suppliers from those used by Nokia Networks. Unlike Nokia Networks' suppliers, Siemens' suppliers were more independent and owned all rights to their components and technologies.

> As a Siemens supplier we were selling the same components and technology to another customer, but in Nokia Networks' case we could not … also the consolidation of the Nokia Networks and Siemens supplier base caused some additional delays (A former Elcoteq employee).

Because of these differences, the merger between Nokia Networks and Siemens stopped the implementation of such communication of changes in the business

environment and in global operations structures for two years. Two years later, following the merger, a similar communication strategy was employed.

4.4.4 Changes in Supplier Networks

During the period from 2000 to 2010, there have been five major disruptions to Nokia Networks and Nokia Siemens Networks' Finnish supplier network: (1) Global EMS companies, such as Flextronics and SCI-Sanmina, continued acquiring Nokia Networks' Finnish suppliers, such as Kyrel and Ojala; (2) Global technology companies, such as ADC, Remec and Powerwave, continued acquiring Nokia Networks' Finnish suppliers, such as Solitra and Filtronics; (3) the merger between Nokia Networks and Siemens; (4) the merger between Nokia Siemens Networks and Motorola and (5) the introduction of Asian suppliers, such as Fingu and Hon Hai.

> Flextronics and SCI-Sanmina acquired companies to gain access to Nokia Networks business, just as they did with buying ABB's and Ericsson's plants earlier … unfortunately, later on all the works from the Finnish plants were transferred away first to Western Europe and later to Asia (A former Scanfil employee).

The citation above describes the way in which large EMS and technology companies operated during that period. Later, in the mid 2000s, these EMS and technology companies encountered significant difficulties because they could not operationally or financially absorb the volume of assets they had bought. These companies have since made progress in this regard.

> Elcoteq faced a problem with NokiaSiemens Networks because NokiaSiemens Networks discontinued producing products that we were manufacturing. That was the end of that relationship … and at the same time Jabil bought Siemens' old plant with a load guarantee. It was then also disastrous for Flextronics and SCI-Sanmina (A former Elcoteq Employee).

In a business marked by constant, fierce competition, business deals such as mergers or contractual load guarantees can cause problems for suppliers. Furthermore, these changes are often so sudden that companies do not have enough time to adapt.

Similarly, in the mobile phone industry, Asian suppliers began to gain shares as parts of supplier networks. Surprisingly, in the mobile infrastructure industry, this gain began to happen much later, in 2006. Furthermore, during the same period, Nokia Siemens Network's Finnish suppliers began to operate at full speed even though they entered Asia much earlier, until suppliers ran on low loads. Since 2006, the move of operations from Finland to Asia has occurred at a much higher rate.

> Unfortunately, that is now the mode of operation in several Finnish electronics companies (A current Efore employee).

In parallel to these major changes in the business environment and global operational structures, there have been many minor changes, which are discussed in greater detail in the next sections of this chapter.

4.4.5 Tracking Offshoring and Outsourcing Strategies

> The trend is obvious! With the financial support of emerging economy countries and because of the markets being moved to Asia and India we were moving our operations as well (A former Alteams employee).

Alteams, Efore, Elcoteq,[2] Incap and Scanfil are outstanding examples of this ongoing transformation. Initially, these firms' exploration of investing and operating offshore dates back to late 1990s. Efore is a firm that followed outsourced offshoring strategy, which then resulted as investing to own operations.

> Our offshoring strategy was based on a partnership with SCI (currently SCI-Sanmina). The collaboration was started in 2001 … Our outsourcing partner offered us a lower risk entry to China, but also to Brazil as well. Later on 2003 we started to expand our own production and we established our own production unit in China (A current Efore employee).

The others implemented offshoring strategies by investing to own offshoring operations from the start.

> "Markets guide and markets force" Jorma Tenkanen.[3]
> We were forced to follow our customer to be able to keep the business, even that there were no business; otherwise Nokia Networks would have chosen a local supplier … we were there only to gain from the tax benefits that were offered to Nokia Networks (A former Scanfil employee).

Elcoteq was in China and India namely because of other customers

> Elcoteq was a supplier for both Nokia Networks and Siemens in the area of Electronic Manufacturing Services, but approximately one year later after the acquisition of Nokia Networks and Siemens Elcoteq delivered the final product from their manufacturing units (A former Elcoteq employee).
> Incap NokiaSiemens network business was ramped down in 2007 (A current Incap employee).

The new offshoring strategy for all of these firms started to affect the manufacturing jobs in Finland quite rabidly. Already, in early 2000, hundreds of manufacturing jobs were cut. Later on, all the manufacturing jobs were transferred away to locations like China and India. As production started to shift quite rabidly in early 2000, a few years later, the research and development started to follow.

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[2] Elcoteq filed for bankruptcy in 2011.

[3] Jorma Tenkanen's presentation at KISA-MET seminar 19th May, 2005; http://www.sc-research.fi/fi/uutiset/030605.htm (information retrieved 14.11.2011).

> We started to consider offshoring of research and development already in 2002 … in 2005 it actually happened, and we established a research and development unit in Suzhou, China (A former Efore employee).

Efore's transfer of research and development operations to China cannot be considered very successful, as the employee turnover rate was initially high. The turnover rate was eventually normalised, encouraging Efore to establish another research and development unit in Shenzhen in 2010.

> Only platform R&D is left here in Finland; all other work has been transferred away (A current Efore employee).

A complete transformation in research & development and production occurred between the late 1990s and 2010. Table 4.3 explains how the geography of different activities has shifted away from Finland to lower-cost locations, primarily in China, but later in India as well. However, there are variations in strategies between the firms.

This move from Finland to China was also affected by the commoditisation of technologies. Commoditisation led to that the product architectures were shifted from single-product architectures to more modular product architectures. The move towards modularity has also led to additional cost reduction requirements. Because Efore has built its business on commoditised technology, Efore have had no other choice than to transfer its operations to lower-cost locations and to localise their supply network. This change was made to follow not only the industry-wide transformations but also their competitors. Furthermore, in commoditised technology business, product life cycles are typically short and feature many product modifications. It is often such that in Efore type of a business firms do not own significant intellectual property rights. This is the case with Efore, in that they do not own specific intellectual property rights in relation to their products, unlike their major competitors. Having no intellectual property rights can currently be considered a major risk to Efore's business, especially in China. Consequently, China has begun to renew their intellectual property rights strategy.

> Efore is a too small as a company to create IPR and fight back if somebody comes and sues us (A former Efore employee).

The two examples of Efore and Alteams, with their focus on technology, provide evidence of how NSN Finnish suppliers have been transferring their

Table 4.3 Changes in geographic locations

	2000–2004	2004–2008	2008–>2012
Research & development	100 % Finland	50 % Finland 50 % Asia	Majority in Asia
Production	Finland 80 % Asia 20 %	Europe 50 % Asia 50 %	Europe 20 % Asia 70 %
Aftermarket services	Mostly in Finland	Mostly Europe	Europe 80 % Asia 20 %

research and development, production and after-sales service operations from advanced economies towards emerging economies. Furthermore, the other three examples, Scanfil, Elcoteq and Incap, which have an electronic manufacturing service focus, provide evidence on how NSN Finnish suppliers have been transferring their production operations from advanced economies towards emerging economies, but only one out of the three has survived. Today, Scanfil is considered to be vertically integrated from the production perspective, offering different types of services from prototyping to serial production. Closeness to Nokia Siemens Networks design in Oulu has definitely been one of the key assets of Scanfil to continue producing for Nokia Siemens Networks.

4.4.6 Measuring Success

The average employee cost can be treated as one of the key performance indicators to measure the success of firms' offshoring and outsourcing strategies. However, there exist other key performance indicators, for example, costs of employees per operating revenue and working capital per employee.

Table 4.4 presents Efore's and Scanfil's average employee cost figures.

In contrast to Efore, Alteams, another technology firm, has been able to lower its average employee cost from 39.714 to 14.219€ from 2001 to 2010 through its structural transformation. Furthermore, similar trends can be identified among firms in the service sector. Compared with Scanfil Elcoteq, another service firm, the average cost of an employee has continued at the same level over the last 10 years (17.020€ in 2001, 12.481€ in 2004, 11.548€ in 2007 and 13.471€ in 2010). Incap follows the same pattern. Among all firms, Nokia Siemens Networks, Efore, Alteams, Scanfil and Incap, wage inequality continues to be the driver of firms' relocation of their global operational structures. The average cost of an employee has reversed from decreasing to increasing, and China is no longer an attractive location featuring lower average employee costs. It seems that in the future, relocations will be in two directions west from China and south from Europe, if the average employee cost continues to be a performance indicator. The average cost of an employee has reversed from decreasing to increasing, and China is no longer an attractive location featuring lower average employee costs.

Table 4.4 Average cost of employees

	2001 (€)	2004 (€)	2007 (€)	2010 (€)
Efore	32,906	29,366	22,417	23,200
Scanfil	12,482	21,291	14,265	14,219

Source Bureau van Dijk Electronic Publishing (BvDEP), ORBIS database

4.5 Conclusions and Discussion

In this chapter, I have examined the changes and challenges of the high-tech business environment of Nokia Siemens Networks and the firm's supplier networks and supply chain. I have studied the changes in Nokia Siemens Networks: (1) business environment; (2) offshoring and outsourcing strategies; (3) operational structures and (4) supplier network. Furthermore, I have examined the integration and the causality, how these changes are translated into firms' offshoring and outsourcing decisions in global supply chains during the period ranging from 2000 to 2010 to answer my research question: *How have offshoring and outsourcing advanced in global high-tech business networks and supply chains?*

In reference to my earlier studies (Seppälä 2010, 2012), there were six major findings discussed in detail: (1) the changes in the business environment were not properly understood; (2) suppliers did not have a strategy and structure to manage their own strategic thinking; (3) there was no collaboration between suppliers; (4) suppliers were running out of the financial capital needed to further invest to meet customers' technology and service requirements; (5) suppliers lacked global brand recognition and (6) technology commoditisation occurred much more quickly than expected, causing extensive cost reduction requirements that suppliers could not fulfil.

Because changes in the business environment of Nokia Siemens Networks were much slower and the product life cycles longer in comparison with the case of Nokia Mobile Phones, the industrial business network had more time to adjust to any requirements set by the business environment and Nokia Siemens Networks. That said, and due to the dynamics in telecommunications infrastructure business networks, findings one, two, four and six seem to be irrelevant to this discussion. However, findings three and five continue to be relevant here.

Based on this examination, there are two new major findings. Furthermore, two other findings are discussed: (1) structural changes in global supply chains and (2) technology commoditisation; the two are reported in separate sections. First, offshoring research & development, industrialisation and production networks have not always benefitted firms, especially suppliers. However, to be able to continue to operate in global supply chains, suppliers were forced to follow their customers. The current supplier networks from advanced economies were used not only because of their knowledge but also to fulfil the localisation requirements set by authorities for the lead firm. Localisation of a supplier network was not possible with local supplier networks, as local suppliers did not have the technological knowledge required. Furthermore, the lead firm wanted to fulfil their contractual obligations to obtain agreed local tax benefits. Firms' average employee cost can be treated as one of the key measures to explain the success or failure of such changes in operational structures. By lowering their average employee costs, suppliers have been able to survive in a volatile market.

Second, outsourcing research & development, industrialisation and production networks have not dramatically changed. However, to be able to continue to

compete in global supply chains, firms were adapting new business models alongside their customers. In the case of the Asian delivery model to customers, for example, the following characteristic was implemented: no extra premiums were charged for R&D efforts. This offer was partially why firms were investing in new services similar to their original strategies. These new services then enabled firms to continue to compete against their Asian competitors.

4.5.1 Structural Changes in Global Supply Chains

The dynamics in industrial networks that cause the disaggregation of global supply chains continue to be one of the key operational strategies that MNEs implement. This condition implies that the knowledge transfer—catch-up effect is continuing to close the skilled labour gap between advanced market economies and emerging market economies. Furthermore, the cost disparities between advanced market economies and emerging market economies, together with decreasing market unit prices, drive firms to offshore both routine and nonroutine tasks and both tacit and non-tacit knowledge-related tasks.

> It started, our production, as customer service operations only; products were actually manufactured elsewhere in the Americas and Finland and then transported to China … The main reason of doing so was just to fulfil the localisation requirements set by the local authorities (A current Efore employee).

To attract more foreign direct investments and to be able to maintain the current level of foreign investments, countries are setting new requirements for firms to localise parts of their research & development, industrialisation and production capabilities, that is, nonroutine and tacit knowledge-intensive tasks. Typically, these localisation requirements entailed the greater involvement of local firms.

> The average sales price decreased throughout 2000 to 2008 tens of percentages; together with weak Chinese currency it then forced us to transfer all our production to China to be able to compete against the local firms (A former Elcoteq employee).
> The transfer of the production has caused the transfer of R&D because with lower production margins in absolute money, you cannot continue to finance high-cost R&D operations in a higher cost country (A former Efore employee).

To be able to respond to local threats and increasing price competition, the firms continue to offshore routine and nonroutine, tacit and non-tacit knowledge-related tasks. There appears not to be any force that can stop this shift of power from advanced market economies towards emerging market economies.

This finding confirms the observation by Grossmann and Rossi-Hansberg (2008) that a decline in a labour cost of task has effects much like factor-augmenting technological progress. This trend began with an industrial network in advanced economies and has now become an industrial network in emerging economies.

4.5.2 Technology Commoditisation

Labour supply shortages, together with technology commoditisation, seem to be another key driver for firms to relocate their global supply chains from advanced market economies to emerging market economies. Simultaneously, with solving the problems in labour supply, tacit and non-tacit knowledge began to be relocated to emerging market economies.

> It all started with technology commoditisation; that was the reason why production was offshored (A former Elcoteq employee).
> We needed floor space for new products to be produced in our Finnish facilities (A former Scanfil employee).
> It continued as a must; you must offer it from a low cost location, otherwise we do not accept your offer (A former Elcoteq employee).

After transferring the production in relation to commoditised technologies, the firms then realised and remembered the facts in relation to physical contacts and geographic proximity between research & development and production units. Quite often, the transfer of production then caused the transfer of the research and development operations on commoditised technologies from advanced market economies to emerging market economies.

> It further evolved as a model that most of the research and development, industrialisation and production-related tasks and processes are nowadays done by industrial business networks in China and India (A current Efore employee).
> Nowadays we are left with small research units in Finland – let us see when that becomes a commodity! (A former Remec employee).

This confirms Blinder's (2007a, b) observation of a dichotomy between activities that require physical contacts and geographical proximity. This phenomenon began with labour shortage and technology commoditisation, causing the offshoring of production and related industrial supply networks. These events led to a condition 10 years later in which most of the product life cycle phases and tasks are carried out in Asian locations for both commoditised and emerging technologies. The process of transferring activities and tasks appears to evolve increasingly quickly.

4.5.3 Parting Thoughts and Conclusions

> The nature of international trade has changed.[4]

Recent findings have indicated that global supply chains continue to operate even in a finer distribution of labour (Baldwin and Venables 2011). Furthermore,

[4] Grossman and Rossi-Hansberg (2006).

the increasing separation of tasks related to research & development, industrialisation and production-related tasks (i.e. disaggregation of firms' cost centres) from the headquarters activities (i.e. firm profit centres) are causing the separation of trade in tasks from trade in goods (Grossman and Rossi-Hansberg 2006). However, the separation of value capture and value creation must also be considered.

> Offshoring continues (a former employee of Elcoteq).

The disaggregation of global supply chains continues to play an important role in firms' strategic decisions. New industrial networks are being transferred from advanced economies to be rebuilt into emerging economies. The current economic environment in advanced economies is accelerating firms' offshoring of activities. Firms continue to search for an optimal breakeven point and maximum financial returns on investments to be able to manage fluctuations in current and future economic environments.

Furthermore, firms are making strategic decisions in moving from emerging market economies back to advanced market economies. This change is due to increasing transaction costs in coordination and logistics. In doing so, firms are breaking up the Asian dominance and control of industrial business networks and in global value and supply chains, which then means that labour-intensive phases of product life cycle and respective tasks are transferred back to Europe and the US from Asia.

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Part II
Organizational and Process Dynamics in Offshoring Knowledge Work

Chapter 5
Exploring Processes and Capabilities in Offshoring Intermediation

Gabriella Lojacono and Olga Annushkina

Abstract The growing offshoring phenomenon has radically transformed the configuration of many industries: fewer rivals, more powerful retailers, transformation of previous manufacturers into marketing companies and emergence of new players. The main driver of offshoring in commodity markets is still today the possibility to benefit from low labour cost. However, cost savings are not enough: the performance of offshoring strategies is determined by outstanding capabilities in product selection, control of suppliers and logistics. This chapter highlights why and how offshoring intermediaries emerged as new players. Using evidence from a case study in small household appliances industry, we describe how intermediating offshoring roles fit with the global reconfiguration of the value chain.

5.1 Reconfiguration of Global Value Chains and Emergence of Offshoring Intermediaries

The diffusion of offshoring strategies in the majority of industries led to the profound revision of firms' strategies and organizational roles. The relocation of manufacturing facilities to the low-cost locations or to the new emerging markets considerably changed the rules of the game for all industry players.

G. Lojacono (✉)
Department of Management and Technology, Bocconi University, Via Röntgen, 1-4th floor, B2 08 20136 Milan, Italy
e-mail: gabriella.lojacono@unibocconi.it

O. Annushkina
Strategic and Entrepreneurial Management Department, SDA Bocconi School of Management, Via Bocconi, 8 20136 Milan, Italy

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The logics of the international allocation of firms' value chains received a significant consideration by international business (IB) scholars (Stopford and Wells 1972; Johanson and Wiedersheim-Paul 1975; Johanson and Vahlne 1977; Buckley and Casson 1993; Diaz-Alejadro 1977; O'Brien 1980; Levitt 1983; Kogut 1985a; Nigh et al. 1986; Bartlett and Ghoshal 1988; Dunning 1995; Africano and Magalhaes 2005). The scholars studied various aspects of the offshore relocation of value chain activities: the definition of which activities are to be relocated, the evolution of the competitive advantage of firms that decided for partial outsourcing and offshoring of their activities, the selection of offshore locations, the organizational aspects regarding the control and monitoring of the offshored activities and many others.

While significant research dealt with firm-level offshoring decisions, few studies were dedicated to the issue of *allocation of value chain activities among firms* in the international context. The classical assumption about the "black" or "white" allocation of value chain among different actors of the industry value system (Porter 1985), transaction costs logics still dominated the IB literature: the activity was located either within firm's boundaries, performed by the firm or outside of firm's boundaries, performed by suppliers or firm's direct clients or distribution channels (Coase 1937; Williamson 1981; Kogut 1985a; Grossman and Hart 1986; Hart and Moore 1990; Doz and Prahalad 1991; Dyer and Singh 1998; Tadelis 2002).

Porter's industry value system and "five forces" frameworks (1985) accounted only for the momentary overlaps in the value chains of different industry actors related to the downward integration of industry suppliers and upward integration of industry customers. In those cases, the overlaps in the actors' value chains lasted only for the industry reassessment phase. The overlap in the value chains of clients and suppliers was also partly acknowledged by scholars who studied concurrent sourcing occurring when "firms both make and buy some of their requirements for a particular component" (Parmigiani and Mitchell 2009).

In the international context with its strong information asymmetry (Johanson and Wiedersheim-Paul 1975; Johanson and Vahlne 1977; Nigh et al. 1986; Casson 1996; O'Grady and Lane 1996; Ricart et al. 2004; Ghemawat 2007), one may expect the existence of lasting, non-temporally overlaps in the value chain activities of firms located at different stages of the industry value system—we decided to call them "grey areas". The permanent "grey areas" of overlapping value chains appear when suppliers start performing their customers' activities or when customers enter their suppliers' businesses. The relocation of production or other value chain activities to low-cost or emerging countries creates favourable conditions for the emergence of lasting in time value chain overlaps among "onshore" firms and their "offshore" suppliers, in particularly when the relocated activity is strongly related to the product or service sold, such as manufacturing or research and design activity. Our paper considers one of the many industry examples, the European small household appliances industry, illustrating how offshoring strategies implemented by European small household appliances producers reshaped the entire industry value system and led to the creation of "grey

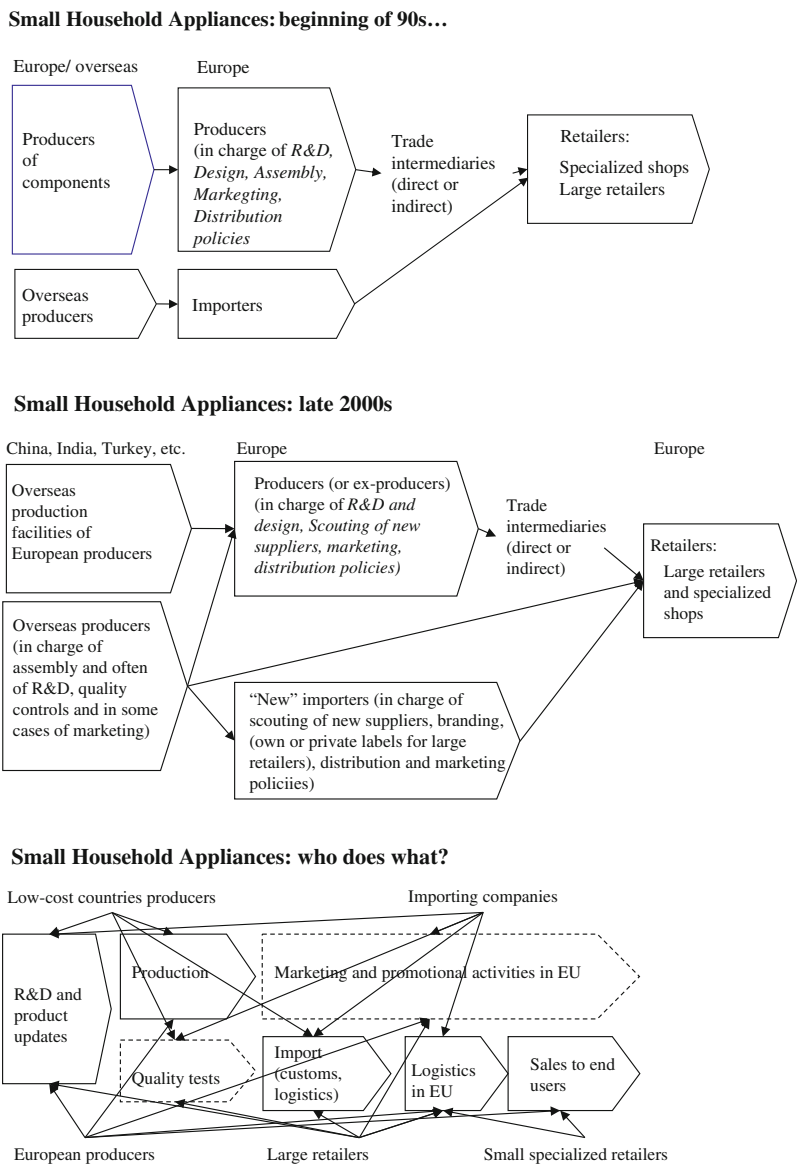

Fig. 5.1 Structural changes in the European small household appliances industry

areas". Figure 5.1 describes the structural changes occurred in the industry in question, comparing industry value systems in early 1990s and in mid-2000s.

Offshoring strategies on the one hand create momentary advantages to the firms in terms of the profit optimization, but on the other hand, in the long run, may call for the revision of the firms' competitive positioning. The evolved industry

structures with overlapping value chains of previously only vertically related industry actors require the new evolved approaches to the business models. The analysis of the sustainability of the firm's business models that traditionally relied upon the assumption that the firm's performance can mainly be challenged by industry trends or potential new entrants or by direct competitors (Porter 1985) with the primary focus on the later, should be completed by the analysis of the potential threat arriving from the vertical integration of value chains of international suppliers or buyers or distribution channels. Firms that happen to operate in the "grey area" of industry value system should evaluate the key factors that create most effective entry barriers and protect the sustainability of their competitive advantage, if there is any. Our exploratory research aims at understanding of the nature of the "grey area" in the international context, but the implications of the research could also be applied to a one-country situation characterized by a vertical integration mobility within an industry.

> Research question 1: In the international context, are there lasting overlaps ("grey areas") in the value chains of previously vertically related firms belonging to the same industry value system?

Our aim is to understand whether the existence of the "grey area" (the assumption was initially confirmed by an exploratory focus group with several industry opinion leaders) is a temporary phenomenon by longitudinal mapping of the value chain activities of offshore intermediaries (OIs) and its main clients and main suppliers.

5.2 The Resource-Based Sustainability of Competitive Advantage in Global Value Chains

The IB research largely employs the resource-based view of the firm for the explanation of the superior performance of internationalized firms. The ownership of superior management, entrepreneurship and technological skills is key for firms' international success (Dunning 1981; Hymer 1960). The accumulation of resources with the effects of scale, scope and learning economies and development of superior resources due to the favourable national context may also be hold responsible for the superior performance of firms on the international markets (Hitt et al. 1997; Kogut 1985b; Porter 1990).

The analysis of sustainability of the business model of offshore intermediaries (OIs), an organizational form connecting domestic manufacturers and foreign buyers, represents a relatively fresh field of study which recently received an increased attention (Peng and Ilinitch 1998; Trabold 2002). The studies of international intermediaries also readily acknowledge the resource-based "view" of the firm. Some of the first scholars studying OIs embraced the manufacturers' perspective and justified the existence of export agents and middlemen as a result of manufacturers' lack of capital and expertise necessary to export their products

directly (Bello and Williamson 1985). Therefore, specialized export companies are there to take on the risks associated with this activity. The "middlemen" (Manke et al. 2008) and "export intermediary" appellations are often intended for export trading companies (ETCs), that is, firms that share the country of origin with the manufacturers they serve (De Noble and Moliver 1989). Global intermediaries are not confined to export agents, but include also local import agents, as well as multinationals that have established distribution facilities in the targeted geographical market (Terpstra and Yu 1990). An examination of the German and British clothing industries pays attention to the existence of mediators between foreign suppliers and domestic retailers, referred to as "co-ordinating firms" and to their coordination capability for their homonymous role in the market's value chain (Lane and Probert 2004). Retailers and merchandisers, in particular, are said to possess "brand name capital" or privileged access to customers that enables them to externalize production to independent suppliers while leveraging their control to obtain lower costs and higher profits (Strange 2006). Peng and York (2001) in their study of the determinants of the performance of OIs expand this approach by integrating transaction costs theory, agency theory and resource-based view of the firm. Their study shifts the focus of the research from the principal to the agent, or OIs, firms that facilitate indirect exporting by foreign manufacturers and importing by domestic distribution (Perry 1990). According to the empirical study conducted on US-based trading companies, (1) the knowledge of foreign markets by OIs, (2) the willingness of OIs to take title to goods and (3) the involvement of OIS in trade of undifferentiated, simple, commodity products with low technological content that do not require complex selling skills—are positively impacting the performance of OIS. In the analysis of the resources on which an OI may relay on, Peng and York (2001) considered mainly the international experience of an OI personnel along with the negotiation abilities of its managers.

A multinational enterprise, including international intermediary, should therefore aim at control of resources that are difficult to acquire, to imitate or substitute in the international context. The competing firms are able, however, in most of cases to acquire resources (skilled and unskilled labour, access to distribution channels, even firm's reputation and brands, client's trust) on the resource markets (Barney 1991). In the international context, the new emerging multinationals are increasingly filling the gaps in their resources mix through mergers, acquisitions, alliances and partnerships (Mathews 2006).

Assuming that a firm's critical resources are not available or are overpriced on the marketplace, the sustainability of its competitive advantage will depend on the degree of imitability of resources and capabilities (or strategic assets) possessed by the firm, namely on the time compression diseconomies, assets mass efficiencies, interconnectedness of asset stocks, asset erosion and casual ambiguity or substitution of asset stocks (Dierickx and Cool 1989). Time compression diseconomies emerge when firm's "crash" interventions on stock creation reveal themselves less efficient (Amit and Shoemaker 1993). If the "internal" organizational learning in some cases can be accelerated, the reaction of other market players (clients, suppliers, competitors and other related firms and individuals) to firm's action (or

"external" learning) is hardly achieved through leapfrog tactics. Some attention was given to the internal organizational learning in the international context (Johanson and Wiedersheim-Paul 1975; Johanson and Vahlne 1977), but few studies were conducted about the importance of "external learning" as one of factors that cause time diseconomies. Brands, clients' and suppliers' trust access to supply and distribution channels and firm's reputation are not only the result of firm's activities, but also the result of third parties' reaction to firm's activities: "it takes two to dance". The asymmetry of information due to cultural, administrative, economic and other distances makes this concept far more important on the international markets than in the one-country context (Casson 1996; Ricart et al. 2004; Ghemawat 2007; Nigh et al. 1986). The internal organizational learning process may allow for acceleration strategies, due to the external acquisition of resources and capabilities. However, such approach limits itself to the assumption that the market's reaction is perfectly rational and can be guided by "intelligent" firms with a "right" set of resources and capabilities. In the real-life situations, managers and entrepreneurs often prefer to deal with domestic or foreign counterparts whom they trust and used to work with, rather than the fellow more efficient competitor of the later. The guided acceleration of the external learning is therefore more difficult and discontinuous, even if still may largely depend on the firm's ability to create favourable perception of its brands, reputation and credibility. We would like therefore to go beyond the country-wise contextualization of the value of firm's resources and capabilities (Miller and Shamsie 1996; Priem and Butler 2001; Wan 2005) and verify the existence of the external *learning* phenomena in the international context which we intuitively assume to be one of the main factors responsible for the survival of OIs working in the "grey" area of global value systems. Other barriers to imitability include assets mass efficiencies and interconnectedness of asset stocks related to the accumulation of a stock of resources and of a "right" mix of resources that facilitate the future resources creation. The value of firm's stock of such resources may also be enhanced through the resources' complementarity (Amit and Shoemaker 1993). Perceived decay rates of assets (assets erosion) may discourage potential imitators. The casual ambiguity in the resources creation exists as is often difficult to determine which kinds of resources will be most relevant for the firm's future. Most of the above-mentioned factors allow us to derive the importance of the time factor, strongly relevant for all above-mentioned imitation deterrents. The time factor becomes most relevant in the fast-evolving international context: in fact, the new emerging "dragon" multinationals is in fact pursuing the accelerated internationalization via external resource-building strategies (Mathews 2006).

Another important factor that protects the industry from the new entrants can be their unwillingness to enter the market. This aspect of sustainability of the business model of OIs was partially addressed by Anderson and Gatignon (1986) in their research that studied the impact of different factors on the efficiency of entry modes.

Research question 2: How OIs, presumably operating in the "grey" area of the industry international value system, manage to maintain their competitive advantage?

Our aim, therefore, will be to investigate on the sources that protect the sustainability of the business model of OIs presumably operating in the "grey area" of the industry value system.

5.3 Research Method

The research questions requiring careful mapping of industry value system activities among key players and understanding of the in-depth reasons of the long-term longevity of OIs, called for a within-case analysis as the basis for building a more focused investigation and for confirming the significance of our research questions (Eisenhardt 1989). When implementing a range of basic choices, the industry players employ certain operative methods that, under our hypothesis, can render their business model more sustainable in the future. To do such an evaluation, we focused on a longitudinal single-case study (Eisenhardt 1991).

First of all, we did a focus group with opinion leaders and market experts to identify the industry major changes. As the main body of the research, we provided a longitudinal quantitative and qualitative assessment of the selected firm and its competitive environment based on various data sources (Yin 1984): (1) over 30 one- to two-hour long interviews with 6 managers responsible for the key activities (purchasing, new product launch, marketing, finance, sales and administration, retailing), three area sales managers, the current CEO and the company founder, the head of the branch office in Hong Kong; (2) mapping of key processes of the selected company; (3) silent observations of three day-long meetings organized by company between its sales representatives and its clients (circa 40 participants); (4) longitudinal firm's statistics analysis; (5) interviews with executives and entrepreneurs in five manufacturing and commercial firms; (6) 8 in-depth face-to-face interviews with large distributors; (7) in-depth financial data analysis for the selected company and its competitors.

5.3.1 Industry Selection

We started our empirical study with the analysis of the international evolution of value system of Italian consumer electronics and small household appliances. According to the exploratory focus group held with 11 industry experts and opinion leaders (coming from distributing companies and industry magazines), the two industries represented common evolution dynamics from the point of view of the product maturity, price-based competition and consecutive production concentration and delocalization of production activities and, in some cases, of such

value-adding activities as design and technology development to low-cost countries. The consumer electronics and small household appliances underwent the "commoditization" process as few service, brand, performance- or quality-improving innovations remain possible. The price competition had an immediate negative effect on the firms' profitability whose possibilities and propensity to invest in technology development and customer service had been constantly diminishing.

Since the end of 1990s, the availability of low-cost suppliers and the incapability or unwillingness of the Italian distribution to source directly in the Far East stimulated the entrance of importing companies, sometimes through an improvised acquisition of containers with a vast range of products at best price in the Far East and consecutive distribution in Italy. Those actors became also the channel through which international producers started obtaining access to more evolved and sophisticated markets which stimulated them to improve their product quality and product range.

Our choice of industry is also justified by heterogeneity of firm strategies in dealing with globalization and increasing price pressures, remained as described by Baden-Fuller and Stopford in (1991).

5.3.2 Company Selection

CAT S.p.A was selected as the most appropriate for the analysis of our research constructs as: (1) its origin dates back to 1983 offering the opportunity to have a sufficiently long time frame for the analysis of strategic factors accumulation (Eisenhardt and Graebner 2007); (2) the firm showed the best performance in 2008 (17 mill. Euro, +25 % respect to 2007; +48 % in 2007/2006), it grew more than the industry on average (+3 % in 2008/2007); (3) the financial holding (i.e. Dmail Group) is listed on Milan Stock Exchange allowing transparent and clear information. The longitudinal case study analysis allowed us to obtain insights on the international allocation of industry value system and to understand the underlying determinants of the inimitability and sustainability of some OIs' competitive advantage.

5.4 International Allocation of Industry Value Chain

The main players of the medium–low segment of analysed industries were low-cost foreign manufacturers, large integrated small domestic (Italian) retailers and large domestic (Italian) retail chains, domestic (Italian) producers that import a part of their product offer, domestic (Italian) wholesalers, OIs (as defined above). The international goods flow was also served by other firms, such as logistics and transportation firms or product quality testing firms.

In 2007, the low-cost manufacturers' value chain included the following activities: logistics, assembly and packaging of final products, sales to OIs and "direct" sales to foreign clients (in our case Italian retailers). Marketing and product promotion activities were limited to product catalogues and participation to trade fairs. Customer service was almost inexistent, mainly due to the low value of the final product. Other activities included product development (often based on imitation of well-known models and brands) and frequent adaptation of product characteristics to the requirements of key foreign clients in terms of quality, product performance and design, procurement, HR and other firm infrastructure activities. The emphasis of the value chain was shifting towards product development activities compared to the standardization and price focus back in the 1980s and 1990s.

CAT S.p.A., as an OI, performed the following activities: definition of the product portfolio in terms of product lines and product categories, scouting of foreign suppliers, product co-development with foreign suppliers, design of product packaging, on-site and pre-shipment product testing, logistics, vertical marketing channel selection and other marketing activities including proprietary brand management.

The domestic (Italian) producers' value chain activities underwent a drastic transformation in the past decade and in 2007 included the same activities performed by OIs and production of some "historical" products (such as grills and barbeques of G3 Ferrari); some of them also maintained or even delocalized in low-cost countries the product development and design functions (e.g. Bimar, Ariete, Imetec).

The small Italian retailers' value chain included the definition of the product range, procurement of products via wholesalers or via "direct" manufacturers' sales representatives and basic store management.

The large Italian retailers' value chain included the definition of the product range, procurement of products via OIs, wholesalers or via "direct" domestic or foreign manufacturers' sales representatives, marketing activating including advertising, promotional campaigns, advanced visual merchandizing, pre-sale and after-sale customer services and, in some cases, online promotions and sales.

The "grey" area of the industry value system contained therefore the following activities: (1) product development performed by OIs and foreign low-cost manufacturers; (2) quality testing performed by OIs and foreign low-cost manufacturers; (3) sell-in activities (transition of products from low-cost foreign producers towards retailers) performed by foreign low-cost manufacturers by direct contacts with domestic retailers, by domestic retailers by scouting and selecting of foreign low-cost manufacturers and also by OIs who act as middlemen between foreign low-cost manufacturers and domestic retailers; (4) brand creation: brands were attributed by some foreign or domestic producers, large retailers (so-called private labels, for example, Kennex by Coop or Watson by Metro) and by OIs.

According to the interviews and to the mapping of value chain activities of CAT S.p.A.'s and of its clients, suppliers and competitors, the overlaps in the

value chain activities of the above-mentioned players existed for at least a decade (starting from early 1990s).

The hypothesis of the persisting existence of the grey area can therefore be confirmed, even if the "grey" area had been continuously evolving: for example, the development of OIs capabilities encouraged large distribution to reduce their involvement in direct purchases from foreign low-cost producers.

5.5 Identification of Key Resources and Capabilities of OIs: CAT

In order to assess CAT's ability to maintain its competitive advantage (RQ2), we identified its main capabilities, identified indicators that allowed us to compare them with CAT's direct competitors and, as suggested by Dierickx and Cool (1989); we then analysed their imitability in terms of time diseconomies, asset interconnectedness and asset stocks, asset erosion and casual ambiguity.

Definition of the product portfolio and product co-development: firm's product selection and development capability relied on the firm's ability to predict market needs on the basis of strong interfunctional links between sales, procurement and product development departments. The three functions jointly analysed market trends (industry trends, firm's own and its potential clients' sales statistics, product offer of large producers and of their direct competitors), defined the tentative product portfolio and then visited most of important trade shows in the Far East and some major low-cost producers compiling the firm's product portfolio. In some cases, CAT directly intervened on product design and performance by suggesting product alterations to producers. The firm's advanced capability to product development was measured by a large number of product categories, significant product renewal (new product categories and articles introduced each year), short product development lead time, share of product modified upon CAT's request in terms of colour, design and technical characteristics).

Procurement: firm's ability to select reliable suppliers (measured with longevity of suppliers) was based on frequent company visits by firm's management, pre-visit analysis of supplier's financial position (where possible). The local personnel of the branch office in Hong Kong was also largely involved in supplier's scouting activities.

Product testing: capability to guarantee the product quality in many cases exceeding clients' expectations was supported by four product quality testing procedures (sample testing along with the technical description of the product technical characteristics, in-line inspection, pre-shipment sample inspection and final inspection in Italy before the delivery to the retailer) which were not compulsory. The product testing activities were performed internally (technical office) and by external international entities employed by CAT.

Vertical marketing channel selection: CAT's capability to work on multiple channels creating important product and activity synergies was the result of careful monitoring of channels' needs and of the firm's related ability to create ad hoc product portfolios and brands in order to avoid conflicts among different channels (e.g. specialized retailing and large distribution).

Domestic logistics: CAT's capability to efficiently manage domestic (Italian) logistics (measured by competitive delivery time to clients) was based on firm's own automated warehouse, long-term contracts with three logistic service providers and firm's own truck for emergent deliveries. CAT's competitive delivery lead time was also the result of immediate order processing procedure (whereas most competitors employed 4–5 days) and of the key product items availability at the warehouse in Italy. Activity and knowledge sharing with the parent company of CAT (a leading direct marketing company in Italy) further enhanced CAT's logistics capabilities.

If some of the firm's resources (such as human resources, financial assets, firm's warehouse) could have been initially acquired on strategic asset markets, the internal process of accumulation and resource interconnectedness allowed for superior firm performance and could serve as a base for the sustainability of the firm's competitive advantage (Table 5.1).

5.6 "Internal" and "External" Time Compression Diseconomies

CAT S.p.A., initially a family-run company, started importing activities in 1983 with a stock of tradable resources (basic human and financial resources and firm's owned warehouse in Italy); at that time, the founder used to go only once a year to the Hong Kong Trade Fair, without a product plan and a list of purchasing criteria, where he would collect manufacturers' catalogues and, coming back to Italy, would order those products to be sold in large quantity, basing his decision mainly on price. The company always tried, however, to comply with its clients' quality expectations by performing random internal quality tests on samples and upon product delivery to CAT's warehouse in Italy, but without involving external quality certification entities and without insisting with suppliers on modifications of their standard products as the product development department was literally inexistent. CAT sold its products (small appliances were not sold until 1992) via a general catalogue (a sort of "bazaar") to the specialized retailers, competing directly with manufacturers at the low end of the market. All contacts between CAT and suppliers were managed by the purchasing office in Italy.

The firm's operations grew, but firm's predominantly intuitive approach to management remained unchanged until the acquisition by Dmail Group, one of the largest direct marketing firms in Italy, in 2000. CAT, therefore, obtained an access to the extensive experience of Dmail on the international supplying markets:

Table 5.1 CAT's capabilities and indicators (2007)

CAT's capability	Indicator	CAT's value	Average competitor's value (as perceived by CAT)
Product selection and development	Product categories (no.)	56	11
	New product categories and articles introduced each year (no.)	243	43
	Product development lead time (months)	3	~4
	Product co-designed with supplier (percentage on total no. of models)	76 %	13 %
Selection of reliable suppliers	Suppliers' rotation rate (percentage of suppliers with at least 10-year long contracts with the firm)	36 %	Close to 30 % for "old" players (who often manage less than 50 suppliers)
Product quality	Percentage of defects	<0.1 %	~3 %
	No. of products sequestered by state quality control entities	0	4
Capability to work on multiple channels	No. of channels served	4 (large retail chains, small retailers, wholesalers, direct sales)	
	Agents (no.)	26	15
	Clients concentration index (top 10 clients on 100 % of sales)	28 %	79 %
	Privately managed brands (no.)	4	1
Domestic logistics	Average delivery time to clients (months)	3	5

Source Company data and interviews

Dmail's sourced its products in low-cost countries through its advanced and well-organized structure and distributed them via Internet, directly owned shops and via mail orders. After the acquisition, CAT restructured its major activities by focusing on quality improvement, delivery time reduction and on the development of new distribution channels (e.g. large retail chains).

In 2006, Dmail appointed a new CEO (an engineer with an MBA title and a 10-year international experience) with the objective to turnaround CAT's operations while maintaining the company's basic values ("historical" attention to the product quality, partner relationships with suppliers) and competencies (e.g. in managing logistic companies). In 12 months, the new management completely restructured the product offer by careful segmentation and renewal of product catalogue and launching of a new brand for the large distribution. The firm restructuring included implementation of interfunctional product development and procurement processes, constitution (in 2006) of a branch office in Hong Kong for the daily supervision of international suppliers, organic growth of the quality testing department, creation of a commercial department with three sales area managers dedicated to each of distribution channels, automation of the firm's warehouse, reorganization of the back office that led to the reduction in order processing time. The evolution of CAT's personnel and external indicators is shown in Table 5.2.

The pre-shipment and on-site quality tests started being routinely managed by international competent bodies (with which, however, CAT had already had long-term relationships). The firm's employees (not only the CEO, as it happened in the past, but also the heads of product development and procurement departments) started to participate to other trade fairs in Asia, USA and Germany and to scout potential producers also outside of China while maintaining long-lasting historical

Table 5.2 CAT's development indicators

	1983	1993	2003	2007
Year of entry in CAT of personnel employed in 2007	3	12	22	27
Quality test department personnel (no. of persons)	0	1	1	3
Purchasing department personnel (no. of persons)	1	1	1	3
Product development department personnel (no. of persons)	0	0	1	2
Marketing and graphics personnel in sale department (no. of persons)	0	0	0	2
Agents (no.)	4	17	22	26
Warehouse (sq. metres)	1,300	3,000	7,000	8,800
Product lines (no.)	15	160	359	637
Suppliers (no.)	7	15	98	138
Clients (no.)	500	1,103	1,710	1,997
Large retail chains				
• No.	0	3	10	19
• Percentage on total revenues	0	10	30	50
Customer care centre personnel (no. of persons)	43	133	247	217

Source Company data and interviews

relationships with the firm's most reliable suppliers. With the time, the suppliers' and product portfolio selection criteria, initially a result of the CEO's intuition, started being developed via a complex mechanism of sales statistics analysis, competitive intelligence, in-store observations, brainstorming with sales area managers and key clients. The selection criteria evolved from price-quality evaluations to a set of variables that included suppliers' reliability, possibility of co-development, possibilities of product or regional exclusivity. The sales department's responsibilities evolved from mere sales activities to a complete product offer management that included definition of graphics, packaging and branding activities.

The firm's "internal" capabilities development received a significant spur after the acquisition by Dmail and the nomination of the new CEO, which, however, would not have been possible without firm's intangible assets being strongly related to the "external market learning" (established relationships and reputation gained with Italian retailers and with some key foreign suppliers) accumulated in 25 years of firm's operations on the market. The long-term relationships with suppliers (more than one-third of suppliers had been working with CAT since mid-1990s) would lead to a preferential track for CAT's orders in terms of suppliers' production planning and would give CAT an advantage of exclusive contracts for product distribution. The long-term relationships with retailers would, on the other hand, lead to an increasing share of CAT in clients' product portfolio who rarely entrusted significant contracts to distributors without having "tested" them for several years.

5.7 Asset Efficiencies: Sustainability of Scale and Scope Advantages

Asset efficiency effects, intended as lower marginal cost of production of further additions to asset stock (Dierickx and Cool 1989), in CAT's case resulted in the possibility for the firm to include large retail chains in its clients' network, initially composed by specialized retailers. The infallible organization of shipments to large retail chains derived from CAT's long-term connections with suppliers network and quality testing entities, logistic companies and CAT's accumulated know-how and financial strength.

The scope advantages of CAT consisted in sharing of CAT's activities and assets (e.g. personnel, customer care centres, warehouse facilities, transport for urgent delivery) among its 1,997 clients (as at 2007): a single, even large, retail chain would incur much higher expenses compared to CAT. In fact, CAT accumulated a significant bargaining power with its suppliers (including 138 producers and dozens of suppliers of services and necessary external consultants, such as logistics and quality testing) whom it also put in competition in order to obtain best possible prices.

CAT also benefited from synergies with its parent company, Dmail, in terms of the knowledge sharing of market trends and negotiation with manufacturers and logistic companies. Dmail's direct marketing activities also provided CAT with an early market feedback on new product categories.

5.8 Asset Erosion and Casual Ambiguity

CAT, in order to avoid the decay of its main capabilities (product selection and development, suppliers' management, product quality, multiple distribution channels management and domestic logistics), had constantly been investing in their maintenance (Table 5.2). CAT invested in the preventive product quality tests in order to fuel its image as a reliable partner, whereas its competitors often preferred ad hoc investments in product repairs. CAT also attempted to create entry barriers by offering post-sales customer service (information about CAT's private label products and eventual repairs) directly to the final consumer.

Ambiguous casual relation of CAT's critical capabilities and its performance laid in general erroneous perception of OIs business model as based mainly on competitive pricing, whereas, according to discussions with CAT management, agents and clients, the main determinants of CAT's success were in its customized approach in fitting various distribution channels' requirements with ad hoc product ranges and brands and assured quality standards along with competitive prices.

5.9 Conclusions

The aim of our study was twofold. Firstly, we analysed one of the many industries that experienced important structural changes thanks to the exponential implementation of offshoring strategies by industry incumbents. Our study allowed to confirm, via a within-case analysis of the evolved international configuration of consumer electronics and small household appliances value system, the existence of the lasting overlaps ("grey areas") in the value chains of previously non-competing firms belonging to the same industry. Secondly, we investigated how firms, operating in the "grey area" emerged thanks to the proliferation of offshoring strategies within the industry's global value system, manage to maintain and defend their competitive advantage.

The case of CAT S.p.A (a firm operating in consumer electronics and small household appliances industry as an offshore intermediary between Italian retailers and Far Eastern low-cost manufacturers), analysed in 2007, confirmed the first hypothesis about the existence, since mid-1990s, of overlaps in product development, quality testing, branding and selling activities among low-cost manufacturers, OIs and Italian retailers. The morphological analysis of CAT's resources and capabilities revealed the importance of "external" time compression

diseconomies that regarded lasting in time acquisition of trust from the part of CAT's suppliers and clients. Asset mass efficiencies allowed CAT to overcome its initial limitations as a supplier of specialized retailers and to start working with large retail chains, which led to further asset accumulation. Asset accumulation in terms of number of suppliers and product lines, maintained by CAT by continuous investments, allowed it to partially transfer its cost, quality and timely delivery advantages to the growing, as a consequence, number of its clients. CAT's asset interconnectedness existed also in terms of the complete service offer to the retailers in terms of product portfolio selection, product testing, branding, logistic services and customer after-sale services. CAT's competitive advantage was also protected by existing casual ambiguity between the firm's performance and the underlying factors as CAT was perceived by its competitors mainly as asset accumulator and scale economies seeker. The capabilities developed by CAT served not only in its direct competition with other OIs, but also as a prevention of complete potential vertical integration of CAT's clients (dissuaded by excellent performance of CAT in terms of service level and pricing, but also by the completeness of CAT's offer) and of CAT's suppliers (discouraged by CAT's development of brands and its strong lock-in relationships with the most important distribution channels for their industry in Italy).

Our exploratory study limits itself to a singular industry case analysis; our findings and our attempts to find indicators characterizing firms' resources and capabilities would allow other researchers to further explore the allocation of industry value systems and to apply resource-based view of the firm in its analysis of 360° sustainability of firm's business model in other international contexts, industries or in a single-country environment.

Our study opens several theoretical implications for future research.

In the first place, the acknowledged via an in-depth longitudinal case study the new phenomenon—"grey areas"—as a consequence of the implemented offshoring strategies should be further explored by quantitative research in other industries that experienced the diffusion of offshoring strategies.

Secondly, our study focused on the sustainability of the competitive advantage for an international offshore intermediary, leaving unexplored the challenges created by the appearance of "grey areas" on the industry competitive landscapes to the industry "main" competing incumbents, former final products producers. The implementation of offshoring strategies certainly allowed those firms to access low-cost resources, to focus on their "core" competences, to slim their corporate structures. But would they be able to defend their competitive positions in case of the intensification of the competitions, with new competitors that enter their "core" businesses and easily develop or access their "core" competences.

Thirdly, the acknowledgment of the "grey areas" in the industries value systems that faced the growing importance of offshoring calls for a deeper analysis of the industry structure and for a new theoretical model able to better explain the evolved industry value systems. According to Porter (1985) and other "classical" approaches to the industry structures, the value chains of the vertically related within-industry firms rarely overlapped: the end of a supplier value chain related to the

beginning of its customer value chain, with rare cases of overlaps. Figure 5.1 described in our chapter showed a whole different picture for one industry that increasingly experience the offshoring of the production facilities to the low-cost locations. The future research should account for the new spatial allocation of the industry value systems and propose a new framework that would account for the "grey areas" in the industry value systems and their implication for the firms' competitive positioning.

Our study also has important implications for the practitioners that evaluate the offshoring opportunities and that attempt to build scenarios for industry evolution. Since the 1970s, the growing specialization in most of manufacturing and service industries brought significant consequences for the firms' competitive strategies. Firms increasingly focused on their "core" competences and "core" businesses, presuming that those competences and businesses were surrounded by everlasting walls able to protect firms from competitors attacks. The source of the competitive advantage was perceived to be in the activity or asset itself rather than in the links among various activities. The latter definitely disappear if a firm decided to implement offshoring strategies, making its competitive position extremely vulnerable to the downward or upward integration of former suppliers or former customers that often managed to relatively easily learn to perform firms' core activities and to acquire the necessary set of competences. Our paper also creates a warning to a practitioner who perceives parallels in the dynamics in its firm's industry evolution with what occurred in the European small household appliances industry and calls for an important consideration about the future of the firm and or its "core business".

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Chapter 6
Offshoring and Outsourcing of Customer-Oriented Business Processes: An International Transaction Value Model

Stephen Tallman and Susan M. Mudambi

Abstract Business processes that involve information processing and human interaction raise unique issues of geography and governance. To explain outsourcing and offshoring decisions by firms, we develop a model of international transaction value that integrates resource-based theory, location economics, and transaction costs theory. This firm-level model provides a strong theoretical foundation for understanding and testing the conditions for effective outsourcing and offshoring of customer-oriented business processes (COBP). In addition to establishing static conditions that should favor greater or lesser degrees of outsourcing and offshoring, the model also provides pathways to suggest how preferences will change under alternative circumstances.

Keywords Offshoring · Outsourcing · Transaction value · Business processes · Resource-based view · Transaction costs theory · Geography and governance

6.1 Introduction

Firms have sought competitive advantage by offshoring and/or outsourcing parts of their operations for years. Offshore production often is tied to comparative advantage on the part of foreign sites of production due to relative factor

S. Tallman (✉)
Robins School of Business, University of Richmond, 1 Gateway Rd,
Richmond, VA 23187, USA
e-mail: stallman@richmond.edu

S. M. Mudambi
Department of Marketing, Temple University, 524 Alter Hall,
1801 Liacouras Walk, Philadelphia, PA 19122, USA
e-mail: susan.mudambi@temple.edu

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endowments, competitive advantage on the part of firms in one location (Porter 1990), or product life-cycle conditions (Vernon 1966). Internalization theory (Buckley and Casson 1976; Dunning 1988) ties the choice of external or internal control of offshore production to transactional conditions that either support or do not support efficient markets for components made in foreign locations. Venkatesan (1992) describes the advantages of outsourcing manufacturing as permitting the firm to focus on making critical components at which it is distinctively skilled, offering lower costs by using suppliers with distinct advantages in making other components and providing incentives to in-house production employees. However, these models have all focused on manufacturing activities. In today's information-intensive global markets, the focus is shifting to business processes, and the service activities provided to customers both inside and outside the firm by companies in many sectors. This situation motivates the development of a geography and governance model to better understand firm sourcing of customer-oriented business processes (COBP).

Business process outsourcing and offshoring (BPO/O) have become increasingly widespread—and have had profound effects on how companies and their customers interact.[1] There is a long history, in both manufacturing and services, of outsourcing noncore activities to suppliers, in the ongoing search for a competitive edge (Quinn and Hilmer 1994). Service firms have long contracted with overseas firms to provide some part of the overall service value-added process (Erramilli 1990; Kotabe et al. 1998; Richardson and Marshall 1999). Services are now the largest component of both developed and developing country economies. They account for more than one-quarter of total world trade and are increasing in importance (World Bank 2005). Both service and non-service firms offshore and outsource business processes, especially those involving information technology (Barclay and Gray 2001). Information management through technology and standardized systems has made outsourcing of business processes much more feasible. These systems and the increasing sophistication of relatively low-cost workers in emerging markets have vastly increased the potential for also offshoring a wide range of business processes. As a consequence, BPO/O is a rapidly growing phenomenon attracting increasing attention from business, policy makers, and scholars.

A large part of the business process story relates to back-office business services such as audit, payroll, personnel, and processes that serve internal customers. These technical services are largely cost centers and have no direct impact on company outputs, revenues, or customers, even if they are sometimes disconcerting to public policy makers. However, according to the research firm IDC, customer service, sales, and marketing comprised 45 % of the total worldwide BPO/O market of $382.5 billion, as far back as 2004. The bulk of some firms'

[1] In this context, outsourcing refers to the contracting of a previously internal business process to unaffiliated parties outside the firm, while offshoring, often of the same knowledge-based activities, refers to locating activities in a foreign country, whether through an affiliated (captive) supplier or through an unaffiliated supplier or outsourcer (Murtha 2004).

customer-oriented operations in sales and service became managed offshore by outsourced suppliers (Gibson 2006).

COBP can be defined as firm activities that involve direct interaction between the firm and its customers and that provide the basis for customer relationships. The rise in the outsourcing and/or offshoring of these processes challenges notions of how customer relationships are formed and maintained and of the value proposition inherent in them. Marketing and strategic management scholars have emphasized the importance of customer focus and customer relationships, suggesting that customer-focused activities are critical to firm-specific advantage (e.g., Kohli and Jaworski 1990; Jaworski and Kohli 1993; Sheth and Parvatiyar 1995). However, in many cases, COBP are not unique firm-specific capabilities, and outside suppliers or offshore facilities, or both, might be of value. We provide a conceptual geography and governance model that clarifies the governance decision of whether and when to manage COBP in-house or through outsourcing, the location decision of whether to provide COBP activities onshore or offshore, the effect choices have on competitive advantage, and how factors may change in predictable patterns in a dynamic context.

Make/buy or outsourcing decisions are typically modeled by drawing on transaction cost economics (TCE) theory (Geyskens et al. 2006), although scholars also turn to the resource-based view (RBV) of the firm for explanations of outsourcing (Barthelemy and Quelin 2006) and related strategic moves, such as alliance strategies (Madhok and Tallman 1998). A consensus seems to be forming that in order to be fully applicable to complex decisions both TCE and RBV needs further development or evolution, with considerable potential for an integrated theoretical perspective (Madhok 1996; Rindfleisch and Heide 1997; Madhok and Tallman 1998; Foss and Knudsen 2003; Foss and Foss 2005; Jacobides and Winter 2005). The benefit of integrating TCE and RBV into an explanatory model has been persuasively argued, with the term "transactional value" used to describe models that integrate transaction costs and resource value perspectives to address alliance strategies (Zajac and Olsen 1993; Madhok 1997).

We integrate TCE and RBV considerations to explain firms' governance choices for service activities. Further, we add explicit consideration of location factors in taking an "international transaction value" approach to the examination of the offshoring and outsourcing of COBP. By simultaneously applying theories of location-based advantage, transaction cost minimization and organizational capabilities as a system of interacting explanatory constructs, we offer a dynamic and integrative strategic management approach to finding competitive advantage through business services. This model is in some ways the application of Dunning's Eclectic Model (1988) to services, providing a coherent analysis of the interaction of firm-specific assets, location issues, and internalization decisions in the service sector. A strategic management interpretation of the eclectic paradigm is well established in the international business strategy literature (Tallman 2004). However, where the Eclectic Model provides a sequential decision process, an international transaction value perspective recognizes that any decision on one

dimension may change the potential value proposition for the multinational enterprise (MNE) along with all dimensions and model this interaction explicitly.

In the next section, we provide an overview of relevant past research in the context of the international trade in services. Next, we introduce an international transaction value model of the COBP sourcing decision, with suggestions about when and why offshoring and outsourcing would be most likely. The final section discusses the managerial and research implications of our geography and governance model.

6.2 COBP Sourcing: Geography and Governance

We focus on COBP because their explicit tie to business customers and consumers creates a need for both superior information transmission and superior customer interaction, as compared to information-focused back-office business processes. While back-office BPO/O can be seen as primarily a technical challenge with important cost control benefits, COBP outsourcing and offshoring raise broader interpersonal and revenue issues (Whitaker et al. 2007). COBP, encompassing marketing, sales, and consulting, have direct value-adding implications, suggesting that decisions about outsourcing and/or offshoring these activities have broad implications for the firm and its economic performance.

A key question is whether firms have the capabilities to leverage technological possibilities in the management of information, while retaining and enhancing the human interaction aspects of COBP that are so important to customer satisfaction (Aron and Singh 2005). All BPO/O involves some inherent "tech versus touch tradeoffs" (Graf and Mudambi 2005), but COBP emphasize these tradeoffs and dilemmas due to the customer contact involved. Firms can reduce overall costs by cutting labor costs through offshoring to lower cost locations, by substituting technology for labor or by outsourcing to specialists, but service quality and customer satisfaction may suffer as a consequence. The challenge for the firm is minimizing overall costs while providing superior customer value and maintaining high levels of customer retention.

The dynamics of COBP outsourcing and offshoring are complex, with actual business practice filled with changes in direction and apparent contradictions. For example, General Electric moved early to set up a captive call center in India, only to later spin off its various business process support activities into Genpact. In November 2003, Hewlett-Packard announced it would set up a customer contact center in India for its North American consumer market (Tata Telecom 10 Dec. 2003b). At about the same time, Dell announced it would stop routing corporate customer calls to a contact center in India, due to customer complaints (Frauenheim 2003). As the size of the BPO/O market grows, firms simultaneously use onshore and offshore providers, spin off or snap up offshore facilities, and sometimes bring processes back in-house at the home location. Given this turbulent environment, it

is instructive to turn to theory and to past research to better understand and explain COBP outsourcing and offshoring decisions as critical strategic decisions.

The following brief literature review begins by introducing customer-oriented business processes as a particular and important category of business processes and then focuses on relevant firm-level research on the international trade in services. To understand the outsourcing and offshoring of customer-oriented business processes, it is important to identify the unique nature of COBP as a set of business processes and to place them into the context of previous research on international trade in business services and sourcing decisions. COBP involve direct interpersonal or indirect technology-enabled interaction between the firm and its customers. Other administrative and technical business processes may involve both interpersonal interaction and interaction with technology, but not within the primary value-adding process. In "back office" business processes, employees largely interact with other employees or service providers, or rely on technology for information transfer between employees. For example, employees may hold face-to-face, telephone-based, or instant messaging discussions regarding expense reports, database maintenance, payroll changes, or accounts receivable. Employees may also obtain data directly from a proprietary website or an online database without any direct interpersonal contact.

Managing the flow of information and communication remains problematic within most firms and supply chains, yet it is the management of the customer experience (Meyer and Schwager 2007) that has been shown to pose special challenges and opportunities for a firm's competitive strategy (Day 2003) and is the focus of our attention here. Direct customer contact, either with employees or through electronic interfaces, distinguishes COBP.

Customer relationship management coordinates and integrates what are commonly known as customer "touch points," defined as the instances and locations of direct contact between the firm and the customer.[2] Although customers do not demand interpersonal interaction from the firm at every touch point, the interpersonal aspect (even via electronic means) is an important determinant of customer satisfaction. Offshoring the human touch aspects can create new management headaches. Firms increasingly recognize the importance of accent training and customer rapport skills to avoid "cross-cultural flashpoints" (Huff 2005), service failures that lead to customer dissatisfaction and negative word-of-mouth. With ever-improving information technology, customers increasingly expect technological interfaces with highly developed interactivity. Interactive multimedia, or rich media, can create knowledge and customer satisfaction, but are relatively more expensive than more static media forms.

The varied nature of COBP emphasizes relevant conceptual distinctions that have been made about service businesses. One key distinction is between core and

[2] The term "touch points" may be somewhat misleading, as touch points can involve a human touch (a telephone call from or to a sales representative), a technology-based touch (a mass-produced email or a customer visit to a website), or a media-based touch (exposure to an advertisement or direct mail piece).

supplementary services. Core services are the main activities that customers seek from a particular service firm, while supplementary services facilitate or complement core activities for any firm (Kotabe et al. 1998). While core services provide competitive advantage to the service firms that provide them, supplementary services also can be important sources of or supports for differentiation and competitive advantage (Anderson and Narus 1995; Kotabe et al. 1998). The further from the firm's core are supplemental COBP such as ordering or customer service operations, the more likely they are to be outsourced or offshored. However, specific processes can and do vary in their strategic centrality depending on the firm. Services that are supplementary to many manufacturers and service providers are core businesses to outsourcing specialists, for instance. By disaggregating the many activities involved in building competitive advantage, to include business processes in general and COBP specifically, firms can identify varying levels of internal competence and strategic importance among their many activities and may adjust over time their perception of what should be outsourced or offshored and what should not be (Venkatesan 1992).

Another conceptual issue is the separability of production and consumption of business services. According to Erramilli (1990), a hard service permits separation of production and consumption (in time and/or space), whereas a soft service requires physical proximity between the service provider and the service consumer and is both produced and consumed simultaneously. Offshoring has been assumed to be feasible in the case of hard services, while colocation has been assumed to be necessary for a soft service provider and customer. Affordable information and communication technology (ICT) has expanded the scope of services that do not require direct contact, by enabling interpersonal interaction without physical proximity through the use of the telephone, voice over internet protocol (VoIP), video conferencing, instant messaging, and other methods. These methods vary in degree of interpersonal interaction, yet each facilitates the separation of production and consumption and the potential for international trade in business processes. At the same time, this separation creates new governance problems to maintain the quality and consistency of customer experiences when a soft service is delivered electronically, possibly limiting the potential for outsourcing soft services.

The expanding scope of services calls into question some assumptions of past research on the differences between services and tangible goods (Zeithaml et al. 1985; Lovelock 1996) and the implications for international services trade (Ekeledo and Sivakumar 1998). Just as manufacturing processes have been de-integrated and contracted out or moved offshore (Kedia and Mukherjee 2009), as firms apply ICT processes and analyze the content of services more closely the information-processing aspects of services are separated more easily from the physical aspects of COBP and from each other. Reducing the scope of direct interpersonal, interactive services enhances the potential of outsourcing and offshoring aspects of COPB. The "hard" versus "soft" designation is less critical than the differences between information or technology-intensive processes and

interaction or touch-intensive processes. Information-intensive processes are primarily focused on providing explicit knowledge to the customer, who must then absorb the information. Interaction-intensiveness implies the development of understanding, of tacit knowledge, through mutual interactions in which knowledge absorption is assisted by the provider, whether face-to-face or at a distance. ICT developments mean that information is more easily delivered across separations in time and space, but meaningful human interactions can take place (depending on the exact nature of the business process) via electronic means as well, though tacit knowledge is more easily transmitted directly (Brown and Duguid 2001).

Past research reveals a need for further conceptual development in how and where to source services and business processes (Kotabe and Murray 2004; Doh 2005). This is especially true for COBP involving direct interaction between the customer and the firm. As a result, past research provides limited guidelines on COBP outsourcing or offshoring. In the next section, we develop a theoretical framework to provide a systematic analysis of the factors affecting the COBP outsourcing/offshoring decisions. The emphasis is on the firm and its strategy, rather than macroeconomic exogenous factors that constrain or drive the firm.

6.3 Application of International Transaction Value to COBP

A starting point for theory building about any business process management is examining the concurrent decisions that firm managers make about the governance (in-house or outsourced) of the process and about the location (onshore or offshore) of the process provider. Nearly all outsourced services, including COBP, are performed off-site from the perspective of the focal firm, whether in the same country or in a foreign location. Although any off-site activity entails some external transactional governance costs to minimize any drop in service quality, we assume that legal and customary demands and expectations will limit difficulties with the service itself if it is provided in the home market by a domestic outsourcer. However, the various geographical and institutional aspects of distance provide a qualitatively different service experience for customers when provided from a foreign site, particularly for interaction-intensive aspects of COBP, and even if the offshore provider is a wholly owned subsidiary (Ghemawat 2001). COBP offshoring is qualitatively different from COBP outsourcing.

At the same time, the transactional or governance risks entailed by outsourcing are likely to be enhanced by distance and boundaries. Offshoring and outsourcing decisions are interactive processes. In parallel with both the governance and the location decisions, the relative importance of COBP-related activities to the firm

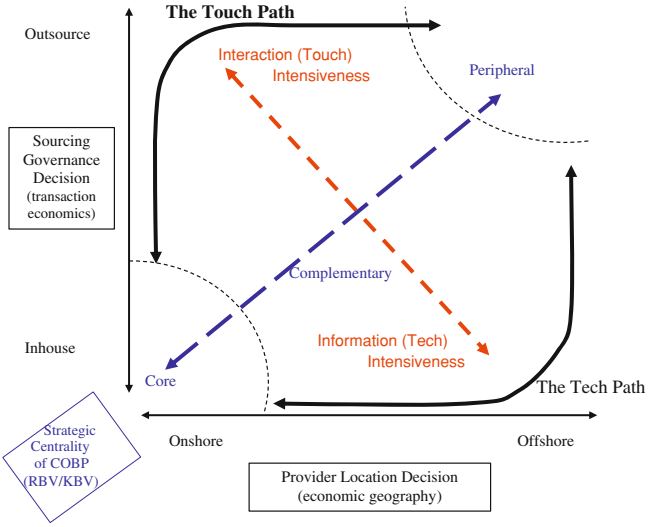

Fig. 6.1 International transactional value model of customer-oriented business process geography and governance

must also impact the "where/how" decision of COBP provision.[3] All three aspects of the international transaction value construct—strategic centrality, transactional governance, and location effects—come to play with both direct and integrated effects on the outsourcing/offshoring decision.

Figure 6.1 provides an illustration of considerations and trade-offs in international transactional value considerations for COBP sourcing. The COBP provision decision is shown on the two primary dimensions: sourcing governance and provider location. Governance can be either internal (in-house) or external (outsourced), and providers can be located either in the home country (onshore) or in a foreign country (offshore). Note that this two-dimensional formulation has become widely accepted among scholars of offshoring, whether of manufacturing or of services (Kedia and Mukherjee 2009). The strategic centrality of a COBP process is equally important to the sourcing decision process (Quinn and Hilmer 1994), moderating the effects of location and transactional conditions on offshoring and outsourcing decisions, and is indicated along the main diagonal, running from core, nearest the origin, through complementary, to peripheral.

[3] We use the terms capabilities and competencies as defined in Tallman (2003). A capability is an intangible firm-specific resource composed of a complex set of interacting assets and processes. These may be more or less central to the competitive advantage of a firm. A core competency is an unique organizational capability that can be shared across units of a corporation to generate competitive advantage in a variety of settings, and that tends to characterize the firm. The range of COBP in an industry may involve a variety of capabilities, some core, others less so for any particular firm. However, COBP are likely to be core competencies only for firms actually involved in providing these services as their primary business.

The dashed curves in Fig 6.1 approximate the conceptual boundaries of the centrality levels. These suggest that at the extremes of strategic centrality, firms will tend either to provide COBP in-house and onshore, for maximum control of core processes, or to contract for the service in an offshore market, in order to minimize related costs of peripheral processes. In intermediate cases, when COBP are shown as complementary activities, important but not core to the firm, another factor comes into strong consideration. The off-diagonal capabilities dimension suggests that the sourcing location and governance decisions will depend on the relative importance of informational (tech) capabilities and interpersonal (touch) capabilities to the firm and its customers when a COBP directly supports the competitive advantage of the firm, but is not at the core of its strategic success. Finally, the two "paths" indicated by heavy curved arrows suggest dynamic aspects of the model to be discussed below.

Figure 6.1 suggests that every solution involves a decision about both governance and location, conditioned by strategic centrality and the perceived importance of tech and touch capabilities. These are dynamic considerations, in that changes in strategic centrality of an activity will impact both location and governance decisions. Although Fig. 6.1 may imply mutually exclusive corner solutions, in the next section we will develop the likelihoods of each outcome in any given sourcing decision.

6.3.1 Theory and the COBP Outsourcing and Offshoring Decisions

Most models of BPO/O have been built around the ideas of TCE as they relate to the make or buy decision (Williamson 1975; Murray and Kotabe 1999). As we consider the concurrent decisions of process sourcing governance, whether internal or external, and location, whether domestic or international, we develop an international transaction value perspective to consider the endogenous effects of resource-based strategy, transaction governance characteristics, and location economics on the locational and governance decisions of COBP sourcing and on each other.

This integrated approach is necessary to understand and explain decisions about outsourcing and offshoring of firm activities that involve direct interaction between the firm and its customers and that provide the basis for customer relationships. However, this complex integrated model requires step-by-step development. The following sections will specifically discuss the costs of transactional uncertainty and the role of location-based advantage in governance and locational decisions about sourcing. Then, we consider the moderating influence of strategic centrality of assets and capabilities on these decisions. Finally, we consider how the specific concerns for information-intensive COBP and interaction-intensive COBP will influence the transactional value of a specific outsourcing/offshoring decision and how these effects may develop over time.

6.3.1.1 Uncertainty Costs, Governance, and the Location Decision

As previously established, the make or buy decision is at the heart of any outsourcing discussion. Transaction cost and internalization models (Coase 1937; Williamson 1975; Buckley and Casson 1976) assume that under efficient market conditions, firms should normally contract for any needed assets or activities in a market transaction. However, under certain conditions—uncertainty, bounded rationality, small numbers bargaining, and asset specificity—market failure in transactions is probable, and the transaction will be internalized (Williamson 1975). COBP were long seen as unique to the firm and internalized, but developing technologies, specialization of practices, and the rise of emerging markets have resulted in increased outsourcing of business processes, primarily relying on alliances (extended contracts or joint ventures) rather than arm's length market transactions.

As these processes have been constantly more finely divided, first into information and interaction-intensive services and then into ever-finer segments of information-intensiveness, the real transaction costs of providing information-intensive services are being consistently more sharply defined on a disaggregated basis. Their information-intensive nature has been greatly affected by improvements in ICT that have made the creation, storage, and transmission of high volumes of information faster, more accurate, and less expensive. This increased bandwidth in ICT and improvements in education and skill levels in emerging economies allow increasingly effective interaction-intensive services to be delivered at a distance. Real transaction costs for outsourced business processes fall with improvements in ICT. Actually, moving customer-related information from one place to another or one organization to another is becoming much more feasible and much less expensive, so that questions of internalization of COBP transactions are dependent on the uncertainties of these transactions.

Transaction costs are higher under conditions of greater uncertainty, and sufficiently high costs may offset any production or skill advantages held by external sources of business services. Transactional uncertainty takes two major forms—environmental uncertainty and behavioral uncertainty, and the costs of making, monitoring, and enforcing market transactions are higher in both cases. While transaction cost models focus on sourcing governance or the make or buy decision, these same costs are critical to the internalization of foreign markets in the eclectic paradigm, so that they are affected by offshoring. Environmental uncertainty costs result from unfamiliar international business environmental issues such as differences in political, economic, legal, social, and technological institutions and are reflected in search and negotiation costs, and the dynamism of ICT and labor markets. Uncertainty is relevant to both onshore and offshore outsourcing, but is likely to be exacerbated in unfamiliar contexts, as explained by the liabilities of foreignness (Zaheer 1995). At the same time, firms are building their levels of international experience, more reliable information on locations is available, and experienced agents and intermediaries can provide investment advice, suggesting that overall levels of environmental uncertainty are falling.

Behavioral uncertainty costs also affect the outsourcing decision. The higher the behavioral uncertainty of potential partners, the higher the expected transaction costs, and the less outsourcing is expected. Any partner can be opportunistic, but the added geographical, cultural, developmental, legal, or regulatory distances of international outsourcing exacerbate any uncertainties about the possibility for opportunistic behavior. Unfamiliarity reduces trust, and distance blunts the effects of reputation, suggesting that behavioral uncertainty is likely to be higher when dealing with potential foreign outsourcers than with domestic providers, at least until the focal firm gains considerable international experience. However, as in the case of environmental uncertainty, exposure to international markets is growing, and reliable information is more available, for specific partners as well as nations. Executives interview prospective partners, intermediaries exist to offer introductions to suppliers, and the increasing concentration of offshore operations make the reputations of suppliers more transparent and more important to maintain. Of course, as quality problems in the manufacture of toys, pet foods, and pharmaceutical precursors in China have shown, supply systems are still often less than transparent. Thus, we expect that in general, uncertainty-related transaction costs are higher for offshore COBP production, but are falling over time.

6.3.1.2 Production Costs, Governance, and the Location Decision

As the real transactional costs decline due to enhanced ICT and as uncertainty about foreign locations declines due to experience (both direct and vicarious), the cost of service provision comes into focus (Walker and Weber 1984). Labor mobility and better information and communication technologies have improved the tradability of services. Several studies have examined the complexity of the location decision of where to site business services (Graf and Mudambi 2005; Bunyaratavej et al. 2007; Doh et al. 2008), with offshoring case studies revealing a diversity of management practices (Pyndt and Pedersen 2006). Where the traditional TCE model assumes production processes and costs to be identical and focuses its arguments on the costs of transactional governance, our international transaction value perspective explicitly incorporates the costs of providing services. A meta-analysis by Geyskens et al. (2006) found that only a few studies in the transaction cost literature have compared in-house and supplier production costs, despite calls by Rindfleisch and Heide (1997) and others for explicit consideration of differential production costs in transaction cost models. Ignoring this is no longer realistic—a firm must compare its internal service provision costs to the equivalent costs of alternative providers and alternative locations. If the cost differential of providing business processes is much lower offsite, home country outsourcing may be a way to lower costs with little added uncertainty about quality.

However, with the rapid development of emerging market economies, home country-based, or onshore, operations may be replaced by offshore providers because of perceived location-based production advantages, even in the face of

some continuing transactional uncertainties (Mudambi 2007). Research suggests that low costs alone are not as important to foreign services provision as is net productivity. Jensen and Pedersen (2008) and Doh et al. (2008) show that when business processes are offshored, the most favored locations are not the least expensive, but those with evidence of more skilled labor and infrastructural development—superior quality as well as lower costs.

Our international transaction value approach explicitly considers the relative costs and quality of service provision. Offshoring traditionally has been seen as a way to reduce costs, but productivity also requires adequate quality of service. ICT-enabled business processes are very dependent on the quality and availability of telecommunication infrastructure and the cost of telecommunications. For example, Calliano and Carpano (2000) concluded that Ireland's telecommunication infrastructure contributed much to its success in attracting investment, and others point to the importance of a well-educated, English-speaking population in Ireland. Technology-intensive services were in the past considered to be in the natural sphere of industrialized economies due to better infrastructure and superior labor skills. However, the trend toward offshoring business processes, plus an overwhelming literature, demonstrates that ICT infrastructure and workers are available in many locations that are both less expensive and appropriately high quality for virtually any information-intensive task (Doh 2005). This explains IBM's India-based staff increase from 9,000 to 43,000 in less than 3 years, its China-based staff growth from 4,200 to 7,200 and the doubling of its staff in Brazil and Eastern Europe (Hamm 2006). At the same time, Indian providers of business process services grew, consolidated, and invested in market countries (Couto and Divakaran 2006). From an international transaction value perspective, we find that the greater the relative increase in ICT and labor productivity of offshore COBP provision sites, the more likely a firm is to offshore its COBP provision.

6.3.2 *Offshore and Outsourced: The Importance of Moderating Factors*

We have suggested that location productivity may favor offshore production of COBP, while lingering transactional uncertainties may favor either home-based, onshore providers or internal control of offshore provision. Yet, we see the use of outsourcers in foreign locations as the most rapidly growing means of providing COBP. Two fundamental aspects of COBP explain why provision of these services is shifting in this radical, even counter-intuitive direction. One relates to the relative strategic importance of COBP to a particular focal firm to the technology of COBP and the other to the relative importance of information- and interaction-intensiveness of a particular service.

6.3.2.1 COBP Strategic Centrality as a Moderating Factor

The RBV of the firm (Barney 1991; Peteraf 1993) emphasizes the importance to the firm of protecting, exploiting, and enhancing the core strategic assets and capabilities of the firm through its choices of strategies and governance mechanisms. Value is tied to the potential for maximizing economic quasi-rents to the firm's unique assets and capabilities through the transaction (Peteraf 1993). Thus, the decision to make or buy inputs to a transaction depends on whether these inputs are key sources of competitive advantage to the firm and, if not, on whether the greatest value enhancement comes from outsourcing to a more competent (and possibly foreign) supplier or from developing these skills in-house. Similarly, the locational choice of offshore or not also should be aligned with the nature of the firm's management resources. In short, according to RBV tenets, the outsourcing and offshoring decisions should be based on the strategic centrality of these capabilities to the focal firm and its competency in comparison with potential suppliers.

Previous research has shown that COBP-oriented resources and capabilities may or may not be central to the firm's competitive advantage. We categorize the possible strategic roles of COBP-oriented capabilities as core, complementary, or peripheral by extending the Kotabe and Murray (2004) typology of core and supplemental. If supplemental, COBP may be relatively important, playing a complementary role (Kotabe et al. 1998), or they may be peripheral—necessary to the business without a direct impact on strategic, rent-generating activities. If COBP are core strategic competencies of the firm, they are likely to stay in-house and under close supervision, no matter the marginal transactional or locational effects, while if COBP are complementary or peripheral aspects of the firm's strategy, they are increasingly likely to be considered ripe for outsourcing and/or offshoring. Consideration of the three specific situations of core, complementary, and peripheral CRM resource centrality merit further explication.

COBP at the strategic core. Not all customers are equally important, and not all customer processes are equally important. For customized luxury goods and for corporate key accounts, the direct relationship between employee and customer is critical to overall strategy. For example, the sophisticated help desk of Rolls-Royce's commercial jet engine division was credited with increasing Rolls-Royce's competitive edge over rival GE (Reed et al. 2005). Some firms in consumer markets also seek to differentiate themselves from competitors on the basis of their relationship strategy. For example, Commerce Bank in the U.S. promised that its phones would be answered by "a real person" not a machine and kept its incoming call center function in-house and onshore. Commerce's customer-centric approach captured market share and positive attention (Bernstel 2006). The niche website www.gethuman.com rated Commerce Bank as an "A" on its "humans first" standard, where several key rivals rated an "F." When COBP are highly central to the firm's strategy, they should be closely controlled by the firm to maximize economic rents to these firm-specific assets. High strategic centrality suggests that firms are unlikely to weight either transactional or

locational factors heavily in deciding to keep these activities in-house and at home. The more a particular COBP is seen as core to the firm's strategy, the more likely it will be sourced in-house from home country locations, no matter the production cost consequences.

COBP on the strategic periphery. On the other extreme, supplemental COBP may be perceived as peripheral to a firm's strategy. Few firms are willing or able to bear the costs, both financial and managerial, of internalizing peripheral activities. Peripheral business processes can be described as those with low operational and structural risk (Aron and Singh 2005). From a resource-based perspective, the focal firm would be expected to have no unique skills and little investment in these activities. Managing a peripheral activity in-house takes managerial time and effort and generally involves opportunity costs of not managing core processes more closely. At the same time, the likely transactional risk of contracting for peripheral activities is minimal—even if a provider is opportunistic, the resulting costs are low. If COBP are seen as peripheral, they will be located wherever they can be provided at the lowest cost, even if this may degrade the capability—the loss of customer value is minimal. In firms with a low degree of firm-specific knowledge or where customer inputs are less immediate to the value-adding process, capabilities in COBP will remain peripheral to the firm's strategy. In addition, other firms that do see COBP as at least part of their core business are likely to be more efficient at delivering COBP. In a globally interconnected world, when COBP are seen as peripheral to the firm's strategy, they are more likely to be provided from offshore locations and to be outsourced to specialists, no matter the risk of uncertainty-related transaction costs.

COBP as a strategic complement. Having addressed the extremes of strategic centrality for COBP, we now turn to the intermediate and likely most common case: that of COBP as a complementary capability, that is, one which does not generate economic rents but is directly tied to other capabilities that do. Customer service, call centers, help desks, complaints, returns, and inquiries are relevant to the mission of satisfying customer needs, but are generally seen as outside the firm's core activities. For example, in 2004, SprintNextel outsourced its call center customer support to IBM. This resulted in a transfer of 4,500 call center positions to IBM as part of larger deal involving the outsourcing of a range of IT services (Datamonitor 2006). In this situation, the firm is likely to consider outsourcing based on the expected transactional value of managing COBP through market or alliance relationships as opposed to handling COBP in-house. Likewise, the cost differences of providing COBP from foreign locations versus from the home market will be important, but the quality of service will still be relevant.

For many companies using COBP, customers interact with company websites and with company employees during the ordering and delivery process and for after-sales service. A technical customer service representative needs to have both general knowledge of computing hardware and software, specific knowledge of the firm's products, operating systems, and business practices, and be able to build trust and rapport with novice and expert customers. Unlike situations when COBP are core competencies, complementary COBP do not generate rents, but unlike

peripheral services, they may well be critical to retaining customers and perceived value. Such services may need to be finely sliced to determine value. For computer help desk support, routine and basic informational questions from consumers are routinely offshored, while highly complex inquiries and questions from key corporate clients may be better handled onshore, even in person. Thus, by the end of 2007, IBM was estimated to have more than 70,000 service employees in India, and Accenture India is expected to employ more than 15,000 professionals (SiliconIndia 2007).

Overall, the net value of the location and governance of transactions will be critical—and interactive. Firms calculate net transactional value when they estimate the rents less costs of the COBP sourcing decision, taking into account the transactional costs of the governance decision of outsource or not, and the locational costs or advantages of the local market or lower cost foreign market. Thus, when COBP are seen as complementary to the firm's strategy, COBP will be governed and located in order to maximize net transaction value for the focal firm.

6.3.2.2 Process Characteristics, Location, and Governance: The Tech versus Touch Tradeoff

We have described COBP as involving both information processing and human interaction, both of which are affected by environmental and behavioral uncertainties in COBP. This distinction is particularly relevant to governance and location choices in the case of complementary COBP. As we have seen, the information-intensive aspects can more easily be delivered via technology at a distance in time or space from the customer, while the human interaction-intensive aspects are more likely to be successful if delivered directly and concurrently to the customer (Mithas and Whitaker 2007). The rapid development of ICT and increases in available bandwidth have improved the speed, quality, and capacity of technology-intensive services greatly, thereby reducing the costs of transmitting information relating to business processes. As a result, firms constantly reanalyze their service activities to isolate informational aspects that can be transferred to technological media from interactional aspects that continue to require the human touch, separating hard from soft aspects and emphasizing the time/space separability of hard services. As the service value chain is de-integrated, and new ICT is applied to information processing, the information creation and analysis portion of the service often can be performed at a distance, both in time and space, while the interaction aspect of the service, the actual delivery, can continue to be delivered directly (Johnson et al. 2005).

More information-intensive processes tend primarily to require superior data transmission and technically skilled workers. We anticipate that in the case of information-intensive COBP, environmental uncertainties can be resolved by understanding macro-conditions—thus, Bangalore, Singapore, or Shanghai can be observed to have a relatively developed ICT infrastructure and technically skilled ICT workers. In addition, the quality of information-intensive services can be

observed, compared to standards, and corrected relatively easily and with fewer time constraints than can human interactions. However, behavioral uncertainty on the part of potential COBP suppliers may be made riskier by their skills. Technology-intensive COBP can involve highly customized ICT systems, which must be exposed to outsourcing partners if they are to be used effectively. The absorptive capacities of such outsourcing specialists for knowledge overflows from a client are relatively high, and the potential to combine such learning with internal skills to benefit the competitors of the original client, or to become competitors with that client, as has happened in the case of manufacturing outsourcing, is apparent. While onshore COBP suppliers can also be opportunistic, closer observation and a common legal and regulatory system should reduce risks, while working in multiple legal jurisdictions internationally reduces protection from such opportunism. Thus, we would expect that in the case of information-intensive COBP, environmental uncertainties are relatively easily resolved, shifting the location choice focus toward production costs, while behavioral uncertainties are exacerbated, encouraging the use of in-house, or captive, suppliers in international markets.

Despite the focus on the face-to-face aspect of human interaction in COBP, increasing bandwidth for ICT allows highly interactive processes to take place indirectly (that is, not face-to-face, as in the case of a help desk with a live operator), typically using telephone or other live voice and/or image transmission technology. While simultaneity of production and consumption is still necessary for interactive services, distance is becoming less of an issue—in some cases. Firms that have strong and unique organizational cultures with specific norms for customer service and a specified approach to customer interaction can provide "that human touch," even indirectly. Their customers may expect to reach a customer service representative who goes the extra mile to serve them and may be dissatisfied with service from a firm that does not have a similar culture, and whose employees go strictly by the book. Customer service may be delivered via electronic communication media and can be highly scripted, but the human interaction aspect of the transaction remains critical. For business processes involving telephone or email contact, language skills are critical (Read 2001), as are quality voice transmission and interpersonal skills. The sales or service representative must be able to "give good phone" (Cool 1988) and develop rapport and trust with customers (Davis and Landaker 2000). Employee attitudes toward technology, interpersonal contact, and their perception of empowerment also play a role.

In the case of interaction-intensive COBP, the costs of uncertainties and consequences of location and governance effects are reversed from the information-intensive context. The quality of the human interaction has been found to be more important to service encounter satisfaction and future business than the quality of the technology interaction or the quality of the information, even among young, tech-savvy customers who had a simple information request (Makarem et al. 2009). Quality and directness of human interaction are tied to location—specifically to cultural and psychic distance from the customer's location. High-interaction services require physical colocation, discounting foreign (or any offsite) production

completely. However, many seemingly informational COBP encounters have relatively high interaction needs—even such an apparently information-focused activity as a computer help desk can become an intensely interpersonal encounter for a novice user with some fear of technology. Thus, environmental uncertainty becomes a greater concern for interaction-intensive COBP.

The importance of identification between the customer and worker is apparent in practice. Up to 50 % of the training in India of business process center employees—who already speak English—is spent on accent neutralization, listening comprehension, and other communication skills. Outsourcers are rated on the basis of their call-handling abilities which include empathy, listening skills, voice, accent, and clarity (Tata Telecom 25 July 2003a). Further, we see rising concern about identity deception in offshore call centers. Many firms require service representatives to conceal the calling location and to use pseudonyms common in the customer's home country (Taylor and Bain 2005; Poster 2007). These practices may be reassuring to some customers, but often increase tension in the service encounter by creating extra pressure on employees and potentially generating customer distrust or anger (Taylor and Bain 2005). Yet, it remains difficult to distinguish whether some communication problems are due to customer unfamiliarity with foreign accents or due to the lack of language proficiency of the outsourcer employees (Yeung 2005). While ICT can offer call clarity, it cannot eliminate foreign accents and attitudes completely and may not be able to avoid such technical nuances as satellite delays that "give away" foreign location. The interpersonal interaction between employee and customer is intended to build rapport and trust and encourage future business, so a tense service encounter can be counterproductive to firm objectives, especially since some disgruntled customers are likely to switch service providers.

Uncertainty about these areas of concern in interaction-intensive COBP is exacerbated for foreign locations, as a priori knowledge of both technical and human capabilities in the host environment is likely to be lower than in the home environment, and potential individual providers will be more difficult to evaluate. Since the monitoring of services providers may require visits of managers from the home country to an offshore location, distances associated with foreign locations also play a potentially important role (Ghemawat 2001). For these reasons, provision of interaction-intensive COBP from the same national culture as the likely customers may be preferred but more costly, particularly if the market in question is in an industrial nation.

We expect that firms are likely to consider reducing costs by outsourcing to specialist providers in the target market or nearby countries with similar attributes—so-called near-shoring. The employees of such firms can be expected to have native cultural attributes, and specific technical training can be provided. To prevent cultural and communication problems, European firms can afford to take a more hands-on approach to training and monitoring the labor force if the service provider is in Hungary than if the service provider is in the Philippines (Beasty 2006). Such specialist suppliers, even in a more expensive location, at least offer economies of scale and scope and superior quality due to their specialized focus,

plus a common legal and regulatory regime offers greater protection from the potential consequences of behavioral uncertainty. Therefore, we suggest that in the case of interaction-intensive COBP, environmental uncertainties are relatively difficult to resolve, shifting the location choice to focus on quality of service and onshore (or perhaps near-shore) locations, where behavioral uncertainties involved in outsourcing are lower, and sourcing can focus on direct cost minimization.

6.3.2.3 The Dynamics of Outsourcing and Offshoring COBP

Finally, the strategic centrality and associated relative pressures toward specific location and governance choices for COBP are dynamic processes, changing with time, competition, and innovation. Specific COBP activities may transition from being core resources, sources of economic rents and sustained competitive advantage, to complementary or peripheral roles as they are finely subdivided and competitors begin to apply similar processes. Help desks were a real advantage to consumer-oriented personal computer companies such as Dell and Gateway at a time when larger firms focused on business customers and could provide on-site support and so saw little value in phone support. Over time, though, help desks became ubiquitous and are now more necessity for participation in the industry than a source of competitive advantage. Similarly, a firm may decide to take a more "customer-friendly" approach, moving its COBP into more strategically relevant locations.

In other cases, what were seen as monolithic services have become separable with improvements in ICT and innovative approaches to service provision. Tax consultants based on the United States can now visit key clients armed with analyses developed in India—the high-priced consultant can see more clients in a given amount of time, and the cost of the data analysis is lowered through offshoring. Of course, the consultant herself may be contracted to the nominal service provider, not an employee, and the India data-cruncher may also be contractor. Such developments in providing COBP seem to be increasing as economic pressures motivate more firms to consider experimenting with different combinations of outsourcing and offshoring and to also reconsider just exactly *what* their firm-specific sources of competitive advantage really are.

Outsourcing and offshoring decisions also are dynamic. Investments in some in-house offshore locations have increased the range of customer services that can be competently handled offshore, capabilities increase with time, and suppliers (particularly foreign suppliers) of services build reputations as they perform. As we have seen, firms have spun off offshore activities, while others have internalized previously contracted services. In the mortgage banking industry, some mortgage lenders have reversed earlier offshoring practices, especially those involving customer-facing processes, due to customer concerns, but have increased the offshoring of back-office and technology-based processes (Masood 2007). When COBP are perceived as supplemental, either marginally complementary or peripheral, firms

sometimes take a trial-and-error approach to offshoring decisions, with considerable learning by doing.

We illustrate the possibilities of changing assessments of international transaction value with the "Tech Path" and "Touch Path" arrows in Fig. 6.1. Each of these is intended to suggest that location and governance decisions can migrate as strategic, transactional, and locational benefits and costs are assessed and reassessed over time. Two paths are selected, as we expect that the relative information-intensiveness or interaction-intensiveness of any particular service will have a significant impact on the choices made, in keeping with the previous section. Consider the dynamics of an information-intensive process, the "Tech Path." As a particular process is seen as less than core to the firm's competitive advantage—possibly due to reassessment of some customer-oriented service, possibly because new technologies have developed, possibly due to a new separation of previously integrated processes—and slips into the range of complementary capabilities, it becomes first more likely to be offshored and only to be outsourced to a partner in the foreign location as its centrality falls further. Upgrading the strategic status of a peripheral information-intensive service would reverse this path by first bringing it in-house then possibly bringing it to the home market only if it is eventually seen as a major source of competitive advantage. This path suggests that retaining control of important complementary assets to avoid behavioral opportunism, even while cutting costs by sending responsibility for providing the service to a foreign location, is the key to managing information-intensive processes.

The "Touch Path" would then be followed in the case of downgraded interaction-intensive processes. We suggest here that, in accordance with the previous section, as an interaction-intensive process moves from core to complementary in its strategic centrality, it is most likely to be outsourced to an onshore provider. This will protect the cultural integrity of the interactions related to the process, while reducing costs by using a specialist provider. As suggested above, behavioral opportunism risks should be minimal in the same jurisdiction and in a relatively small and specialized market. If the process continues to lose importance to the focal firm, we would expect that, as a peripheral capability, it would eventually be moved offshore to a foreign outsourcer, possibly by the focal firm or possibly by the domestic outsourcer via a subcontract. Likewise, a developing realization that an offshored and outsourced interaction-intensive service needed to be upgraded, possibly due to a renewed consumer service emphasis, should lead to first bringing the service closer to the customer, either onshore or at least to a "near-shore" location, and only later to bring it in-house.

Of course, these are projected tendencies, and many COBP mix information and interaction-intensiveness. In addition, firms often do not have a solid perception of just how central a process may be to their strategies, and these strategies may change. Further, COBP that are seen initially as information-intensive may turn out to have greater than expected interaction issues attributed to them by customers and may need to switch from one path to the other (or at least from an inclination in one direction to an inclination in the other). This may be, for

instance, the key to Dell bringing some of its help desk activities back onshore. Dell thought that the help desk existed to provide information to users, while Dell's business customers expected not just information, but customized information and customized interpersonal interaction guided by a deeper understanding of business needs and business culture—a difficult role to send offshore.

6.4 Conclusions and Implications

The growth of COBP outsourcing and offshoring as a key strategic decision reflects the overall rise of the global service economy. The growing occurrence of BPO/O reflects the integration of the powerful forces of the service economy, the increasing role of information technology, and globalization. For competitive reasons, firms want their business processes to be high tech, with low labor costs and high service quality, and are turning to a globally dispersed value chain strategy to make this possible. Customer-oriented, but offshored, business processes remain highly telephone or voice-based while becoming sufficiently sophisticated as to be referred to as "knowledge process outsourcing" or "judgment-based outsourcing" (Anonymous 2006).[4] We have focused on customer-oriented services common to most consumers and firms, yet the next generation of offshoring is likely to encompass a wide range of innovation and knowledge creation activities (Lewin and Couto 2007). Firms are rethinking their strategies and structures in order to cut costs, but also to better serve their customers and seize new opportunities. The conceptual model offered in this chapter is intended to shed light on these decision making challenges.

Overall, our model of COBP outsourcing and offshoring decisions builds on the solid theoretical framework of transactional value theory, as a combination of resource and capability theory and transaction cost theory, and also applies theories of location-based advantage. In doing so, the model takes a strategic management approach to Dunning's (1988) eclectic paradigm and applies it to service activities. This can be considered a geography and governance model. The model incorporates concepts of asset specificity and production costs into the model, and it uses multiple measures of environmental uncertainty and behavioral uncertainty to describe potential transaction-related costs. The model also includes the moderating factors of COBP resource centrality and the relative importance of tech versus touch and is one of the first to incorporate the role of both human touch and information technology. In this way, it reflects much of the complexity of the COBP outsourcing decision in a global business environment characterized by rising utilization of ICT, but also one with rising customer expectations for expert

[4] Note that popular parlance still frequently fails to differentiate outsourcing and offshoring. Popular concerns are primarily with offshore value production, but popular terminology describes the governance decision. As scholars make the distinction found in Fig. 6.1, perhaps this will change in the wider parlance.

and personalized service. Of particular note is that not all "human interaction" transactions require actual face-to-face interaction. The "touch" may be electronic in many cases, so long as a sense of human caring is transmitted.

Our international transaction value model is potentially generalizable to other forms of outsourcing and offshoring. If we focus on customer preferences in goods versus productivity and efficiency, we see many of the same influences—which is of course the driving force behind models of strategic outsourcing (Quinn and Hilmer 1994) and of international production (Dunning 1988) of goods—although the real costs of moving goods long distances make "real transaction costs" much more important to manufacturing than to technology-assisted information flows. Likewise, although many of the insights that we have provided on COBP can be applied to other forms of BPO/O, the lack of customer and revenue focus of back-office processes make the concern for customer satisfaction and quality interactions much less salient. Payroll operations will be offshored to a less expensive provider, even if the home country personnel office might be forced to adapt—paying customers will demand more consideration when they are part of the transaction. Thus, while the international transaction value model can undoubtedly be used more generally, it seems to provide the greatest clarity in the case of customer-oriented business processes.

The international transaction value model and our interacting considerations lend themselves to future empirical testing. Testing will provide additional insights and specific managerial guidance. To test the framework empirically, our model will need further refinement, with measures developed for each construct. Although the empirical research can utilize existing scales to some degree, the areas of new theory development will require new constructs and measures. Empirical testing also raises a number of data questions. Data on business process outsourcing are becoming more available, yet a number of data collection issues remain, especially for cross-country research. Given adequate data, future research could also examine the moderating effects of the firm's network of organizational relationships, as suggested by Geyskens et al. (2006).

The governance question raised at the outset of the paper was when, why, and how are companies shifting COBP to outsourced and/or offshore providers? Part of the answer to this question is that customer relationships are not a key source of competitive advantage to all firms. A greater part of the answer is tied to expected value. McKinsey and Company calculated that every dollar's worth of business offshored from the United States and United Kingdom creates between $1.45 and $1.47 of value, with at least $1.12 being reinvested back to the United States or United Kingdom and the rest going to the recipient country (Yeung 2005). Our international transaction value model provides an in-depth, theoretically grounded answer to this question. Firms calculate net transactional value by estimating the rents less costs of the COBP sourcing decision, taking into account the transactional costs of the governance decision to outsource or not, and the locational costs of the siting decision between a local or lower cost foreign market. In addition, the resulting levels of customer satisfaction, process improvement, capability enhancement, and firm learning should also be considered in the net value calculation.

Companies are rethinking their strategies and crossing international boundaries in order to better serve their customers, seize new opportunities, and cut costs. As firms seek ways to better manage COBP for their continued competitive advantage, firms consider a range of inter-organizational governance structures (Heide 1994). This may mean managing processes in-house or by outsourcing, onshore or offshore. For many firms, outsourcing options are likely to remain attractive, either in offshore or onshore locations. Our research illustrates that the factors underlying outsourcing and offshoring are not the same—but they are related. As long as environmental and behavioral uncertainty costs continue to decrease due to IT advances and globalization, and outsourcer cost advantages remain significant, outsourcing and offshoring COBP will continue to grow. Growth may be limited by firm recognition of the strategic importance of customer relationships in some markets and by customer demands for higher levels of interpersonal competence from their service providers. Even in a high tech, global world, human touch still matters.

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Chapter 7
Offshoring White-Collar Work: An Explorative Investigation of the Processes and Mechanisms in Two Danish Manufacturing Firms

Dmitrij Slepniov, Marcus M. Larsen, Brian Vejrum Wæhrens, Torben Pedersen and John Johansen

Abstract The purpose of this chapter is twofold: to explain why white-collar service work in manufacturing firms is increasingly subject to offshoring and to understand the effects of this process on work integration mechanisms. The empirical part of the study is based on two case studies of Danish manufacturers. First, the chapter finds that drivers of white-collar work offshoring in many respects are parallel to those of the earlier wave of blue-collar work offshoring, that is, cost minimisation and resource seeking. Second, due to the interdependence of white-collar tasks with the rest of the organisation, our results suggest that white-collar offshoring in manufacturing firms poses higher requirements to the organisational configuration and capabilities compared with blue-collar work. We conceptualise the effects of white-collar work offshoring in a framework relating white-collar work to integration mechanisms companies instigate to manage it on a global scale.

Keywords White-collar work · Manufacturing firms · Offshoring · Case studies

D. Slepniov (✉) · B. V. Wæhrens · J. Johansen
Department of Business and Management, Center for Industrial Production, Aalborg University, Fibigerstraede 10, 9220 Aalborg, Denmark
e-mail: ds@production.aau.dk

B. V. Wæhrens
e-mail: bvw@production.aau.dk

J. Johansen
e-mail: jj@production.aau.dk

M. M. Larsen · T. Pedersen
Department of Strategic Management and Globalization, Copenhagen Business School, Kilevej 14, 2000 Frederiksberg, Denmark
e-mail: mml.smg@cbs.dk

T. Pedersen
e-mail: tp.smg@cbs.dk

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7.1 Introduction

The powerful forces of globalisation are pushing the global deployment of work into rapid development (e.g. Ferdows 1997; Farrell 2004; Gereffi 2006; Mudambi 2008). Manufacturing firms from the traditional industrial 'triad' of North America, Western Europe and Japan are organising their operations in global operations networks, replacing the traditional collocated and vertically integrated value chain. The globalisation of standardised manufacturing operations based predominantly on blue-collar work began some decades ago. However, recent developments in offshoring also include the spread of the phenomenon to new occupational areas based on more knowledge-intensive white-collar work (e.g. Lewin and Couto 2007; Kennedy and Sharma 2009). Friedman (2005) argues that the world has been 'flattened' by the convergence of the major political events of the past two decades, innovations and companies. These three factors combined have created new conditions, methods and tools for international and inter-firm collaboration, making geographical divisions increasingly irrelevant. As a result, the mobility of value-chain activities has increased, and current research seems to suggest that work can occur wherever the right technologies, skills and knowledge can be found (Doh 2005).

The purpose of this chapter is to explore and discuss this trend white-collar offshoring from the perspective of manufacturing firms. Such firms have been pioneers with regards to blue-collar offshoring and therefore provide a good starting point for a discussion of the offshoring of white-collar activities. However, while this has been documented in the literature (e.g. Brainard and Collins 2005; Mudambi 2008), this new development of white-collar offshoring leaves us with unanswered questions. First of all, what drives manufacturing companies to offshore white-collar work? White-collar work, characterised by its creative and intellectual nature (Hopp et al. 2009), is argued to be more difficult to dispatch from the home organisation (Yu and Levy 2010), and it is therefore pertaining to understand why firms seek to relocate these activities abroad. Secondly, what are the firm-level implications of white-collar offshoring? The question is important because offshoring is not simply a case about jobs being moved offshore; rather, it is about a fundamental reorganisation of work, in which different tasks are affected. International business literature has investigated the challenges of successfully integrating globally dispersed activities (Birkinshaw et al. 1995; Kim et al. 2003; Kumar et al. 2009). However, whether the same assumptions are equally applicable for white-collar offshoring in manufacturing firms is an underexplored topic. In response to these concerns, this chapter aims to explore why white-collar service work in manufacturing firms is increasingly subject to offshoring and to understand the effects of this process on work integration mechanisms for the firms involved.

The empirical foundation of this chapter consists of two qualitative case studies of Danish manufacturing firms involved in offshoring white-collar work. The context of Denmark offers a good opportunity for offshoring analysis and potential generalisation of its results to other industrialised countries. Denmark is no

exception to the growth in scale and scope of the offshoring phenomenon. The country enjoys high level of industrialisation and economic development and has high labour costs, and the manufacturing sector has traditionally played a very important role in Denmark's economy. Statistics Denmark (2008) reported that 19 % of all Danish companies (with 50 or more employees) sourced internationally. The same study found that the offshoring phenomenon affects most parts of the value-chain activities and is no longer confined to standardised non-core activities.

Based on the case studies employed in this chapter, we argue, first of all, that the antecedents and drivers of white-collar work offshoring in many respects are parallel to those of blue-collar work offshoring, emphasising cost- and resource-driven strategies. Second, we suggest that although the main drivers of offshoring white-collar work are similar to those for blue-collar work, the nature of white-collar work results in different challenges, mainly the integration of offshored white-collar work with domestic activities. This has implications for the effective integration of the globally dispersed activities to which we propose a refined framework of global integration based on the types of offshored white-collar work.

The chapter has three parts. The following section introduces the theoretical background of the study. We then proceed with the methods and the case studies used in the chapter. The third section presents the discussion before we conclude with the major findings and limitations of the study.

7.2 Theoretical Background

Manufacturing companies increasingly participate in highly complex cross-border arrangements involving a wide array of partners (e.g. Gottfredson et al. 2005; Mol et al. 2005; McIvor 2005; Pyndt and Pedersen 2006). A wide amalgam of interchangeable terms is used in the academic and professional literature to describe these practices. These include global sourcing, international outsourcing, subcontracting, offshoring, the globalisation of production, to mention just a few. To reduce the terminological muddle, the variety of terms in this chapter are condensed to one—offshoring. The term 'offshoring' is used here to denote the idea of dispatching work to owned subsidiaries and/or third parties in a foreign country.

The offshoring research to date can be characterised by a sectoral division, that is, analysis of the offshoring phenomenon is often bound by individual sectors of the economy (Brainard and Collins 2005). The literature discussing offshoring of services tends to focus on traditional 'service sector' represented by software services firms, call centres and business process outsourcing (BPO), that is, service providers, while the literature dealing with manufacturing firms is largely preoccupied with production offshoring. In this chapter, we argue that to gain richer insight into the offshoring phenomenon, especially regarding high-value knowledge-intensive activities, it is important to reach beyond this traditional split. Therefore, this chapter focuses on the service-oriented white-collar activities of manufacturing firms and seeks to understand the drivers and mechanisms of

white-collar work offshoring. In defining white-collar work, we draw on Hopp et al.'s (2009) definition classifying work as blue or white collar in relation to two dimensions: (1) Intellectual versus Physical: white-collar tasks involve significant use of knowledge, while blue-collar tasks entail primarily physical transformations and (2) Creative versus Routine: White-collar tasks rely on creativity and novel solutions, while blue-collar tasks involve repetitive application of known methods.

One might rightly argue that the idea of offshoring is not new. Although it has reached unprecedented level in recent years, the first significant waves of production offshoring began in the 1960s as 'soaring wage costs in the industrialised countries raise the prospects of wholesale movements of industrial facilities across national boundaries' (Leontiades 1971, p. 20). According to De Vita and Wang (2006), the 1980s mark the epoch, when the notion of 'small size and high value' rather than 'large size and high volume' was accepted as the key to competitiveness. The idea of 'small size and high value' was encapsulated in the concept of core competence (Hamel and Prahalad 1990), which called for managers to build core competencies; anything other than this should be considered as candidates for outsourcing or, in other words, an external provider should be employed.

Offshoring, in its more traditional understanding, has therefore dominantly concerned blue-collar work, such as production. According to Hutzschenreuter et al. (2011), if compared with the offshoring of production processes, the offshoring of service-oriented white-collar activities is a fairly new phenomenon. The widespread offshoring of white-collar activities might even seem counterintuitive for a number of reasons. First, they are situated locally and often depend on local conditions. Because they have been developed and kept in-house for a long time, these activities are closely interlinked and often are heavily dependent on the organisational systems from which they originate (Blackler 1995). Second, the transferability of these activities is likely to be low. It is hampered by challenges of capturing and transmitting tacit knowledge characterising white-collar work (Grant and Gregory 1997; Szulanski and Jensen 2006). Third, the rate of change of knowledge also affects how it should be transferred (Ferdows 2006). Although specific metrics are lacking for assessing the speed of change of a particular knowledge type, it is reasonable to expect that because of intellectual and creative nature of white-collar work, knowledge related to it is likely to change faster than knowledge related to blue-collar work, characterised by manual and routine nature of tasks.

Yu and Levy (2010) also examine the reasons why we may expect it is more difficult to offshore professional white-collar work than blue-collar manufacturing work. These reasons may be organised into three groups: the staff-related, the process-related and the institution-related. First, the staff-related factors deal with how white-collar staff, due to their ability to control the conditions of and inputs to the work (primarily knowledge), become 'non-substitutable' or otherwise develop capabilities to safeguard their work and to oppose offshoring through political means (Levy and Murnane 2004).

Second, the process-related factors deal with the organisation of work processes and the degree of transferability of work processes. Due to a lack of appropriate supply market opportunities and a low degree of routinised work that can be

specified into discrete rules, white-collar work is less mobile than blue-collar work. This can partly be explained by the above-mentioned staff-related factors, but also by the nature of the work processes. From the world of manufacturing, we know that the development of robust processes improves manufacturing mobility (Gregory and Grant 1997). A robust process can be cloned and transferred to a host site while maintaining network commonality and avoiding adaptation costs. Robust processes can be transferred to any location and will be appropriate for the local conditions as they, by definition, are host independent. White-collar work in general does not lend itself easily to this form of standardisation as it is less repetitive and more reliant on a given set of host characteristics compared with most blue-collar work processes.

Third, the institutional- and location-specific factors supporting work can be found partly in the national institutions and their support structures, rules and norms and in the relational arrangements with suppliers, universities and even competitors; participation in such arrangements often requires a local presence. In other words, the white-collar work requires face-to-face communication and is related to the contextual setting in which the activity is taking place, resulting in its lower 'offshorability' (Kim et al. 2003).

Nevertheless, there is some evidence to suggest that the higher value-adding higher-skill-content activities are also increasingly affected by the offshoring trends (e.g. Lewin and Couto 2007; Statistics Denmark 2008). Lewin et al. (2009), for instance, argue that companies have begun to offshore innovation as a response to a 'global race for talent' explained by a growingly insufficient (Western) home–country supply of qualified labour. As the existing models of offshoring do not necessarily fully predict and explain this development, the first inquiry to the case studies is accordingly to unravel factors explaining this paradoxical development.

For the development of efficient and effective global value chains, it is important to understand the radical fine slicing, or in other words, fragmentation of the value chain and its effect on various job categories as well as their integration in the pursuit of network synergies. Firms today need to create advantages based not only on the efficacy of individual functions or particular sites, but also on the advantages that may derive from the interplay of these two things and from the utilisation of global synergies. In the following, we outline our methodology and discuss the case studies in order to illustrate the process and organisation of dispersed white-collar work and to answer propositions outlined in the previous sections.

7.3 Methodology and Case Studies

The empirical part of the study is based on two case studies of Danish manufacturing companies. They are currently engaged in a number of initiatives that stretch their operations on a global scale. The main focus of the case studies is on the companies' attempts to exploit opportunities from offshoring white-collar work, or, more specifically, procurement and R&D activities. The key criteria for the selection of the

cases were as follows: (1) involvement in global dispersion of activities and (2) implementation of white-collar work offshoring initiatives. In each case, a focal function was chosen at the outset of the study (i.e. procurement and R&D), and an in-depth study of the global configuration, interdependencies of the business function in focus and the ongoing work processes within it was conducted. For each case, we conducted formal semi-structured interviews (Case A is based on 4 interviews and in Case B 6 were conducted) and a number of informal discussions with informants during site visits also served as a source of information (4 site visits were conducted in Case A, and Case B company was visited 3 times). The interviews ranged from one to two hours. The interviews were used to gain an in-depth picture of each company's situation. In addition, documents and records were studied, including annual reports, press releases and presentation material to customers and stakeholders. The offshoring process started prior to our involvement in the cases. Therefore, some events relevant to the study had to be captured in retrospect.

The case study, one of several qualitative research methods, has been chosen for this investigation for several reasons. First, case studies can describe, enlighten and explain real-life phenomena that are too complex for strategies of inquiry requiring tightly structured designs or prespecified data sets. Second, according to Yin (2009), case studies are generally preferred for answering 'how' and 'why' questions about a contemporary phenomenon over events in which the investigator has little or no control. The current study satisfies all three criteria (i.e. the type of questions, phenomenon and controllability) and thus is well suited for the case study strategy. The phenomenon of white-collar work offshoring is still at the understanding and discovery stage. Instrumentally, the case study strategy can further understanding of particular issues or concepts which have not been deeply investigated so far (Eisenhardt 1989; Yin 2009). Furthermore, the case study strategy does not split a phenomenon from its context. This feature of the case study method is consistent with the need to better understand value-chain reconfigurations and their effect and changing demands on types of jobs and their integration within manufacturing firms. It is also very important for studying various aspects of the process of offshoring, which is tightly interlinked with its context. As far as the controllability issue is concerned, case studies again emerge as the preferred method. On the one hand, we had sufficient access to the actual phenomenon through direct observation of the events and interviews with the people involved. On the other hand, the amount of control we had over the events did not allow the application of other methods such as a participatory action research.

7.3.1 Case A: Organising Procurement on a Global Scale

Company A develops and markets a wide range of children's life-enriching products and has grown to become one of the world's best-known brands. Today, the company's core business is built around the production of plastic elements construction toys. It has approximately 7,000 employees worldwide.

Facing serious financial difficulties in 2003–2004, the company embarked upon a widespread production offshoring initiative, which resulted in a significant reduction in jobs at the company's domestic site in Denmark. In 2005–2007, the offshoring initiative was based on collaboration with external manufacturing service providers, with the main capacity groups being relocated to Hungary, the Czech Republic and Mexico. The plans to locate the capacity groups in these countries were determined by the considerations of cost minimisation, market proximity and economies of scale. In 2008, the challenges of coordination and control influenced Company A to phase out the partnership with its major outsourcing partner while maintaining its globally dispersed production set-up by taking control of the overseas sites.

The reconfiguration of the company's production set-up had the most immediate effect on the blue-collar production employees and the organisation of the manufacturing system. However, this process also affected other functions connected to the manufacturing system. For example, the procurement function, which was traditionally centralised and located in Denmark, changed dramatically as a result of the production offshoring initiative. In 2005, as Company A started transferring production to the external manufacturing service providers outside Denmark, the procurement function followed the suit. This meant that the scope of the procurement task was significantly reduced, as the procurement department remaining in Denmark had to support only one production site, which was significantly downsized. Slimming down could be observed in all categories of the procurement function (i.e. raw materials, print and packaging, finished parts, promotional material).

In 2008, as the company 'back-sourced' the sites in Hungary, the Czech Republic and Mexico, the procurement department of approximately 70 employees was again faced with the challenge of acquiring materials for the whole company, that is, the lead site in Denmark and the three sites overseas. Initially, the management of the department consisting of the vice president for procurement, directors responsible for procurement categories as well as global buyers dealing with strategic suppliers was located in Denmark, while local buyers in charge of routine procurement tasks were distributed globally among the four sites.

The geographical dispersion implied the relative independence of the local procurement departments. Nevertheless, these local procurement departments were given mandates to acquire materials and components not only for local sites but also for the sites located in other countries. Explaining the reasons for this, a senior manager in Denmark noted:

> Although we could also service foreign sites from Denmark, today there is a tendency to delegate more procurement tasks to foreign sites. By doing this we empower these sites and often they can also do the tasks cheaper.

It was a big coordination challenge and difficulties were highlighted by procurement staff in all four countries. The overseas production sites were very different from the company's lead site in Denmark. Consequently, the three sites were struggling with the way things were done at the lead site. This was also true

for the procurement departments at each site, as they had different levels of maturity, which were culturally distinct and in some procurement categories had low commonality of purchase. A senior manager stated:

> Coordinating under this circumstances is a huge task for us. It requires not only changing procedures, but also changing the mindset.

Another challenge for the organisation of procurement was that the critical mass of production was increasingly shifting to offshore locations. In 2004, almost 95 % of the company's production capacity was located in Denmark. However, in the end of 2009, this figure dwindled to 60 %. To keep up with this trend, the tasks of more creative and intellectual nature were offshored. For example, the head of the procurement function was located in the Czech Republic, which was emerging as an important central European hub for the company. As part of the attempts to ensure that the procurement function is organised so that it can effectively support the company's global production footprint, a number of global buyer positions, responsibilities of which involved negotiations with strategic suppliers, were also offshored.

A number of integration mechanisms were used to ensure the global integration of routine tasks (e.g. local buyers) and creative/intellectual (e.g. global buyers and management) tasks subjected to offshoring. These included programs stimulating having an aligned approach towards suppliers, bundling procurement across production sites as much as possible to leveraging volume at the supplier markets and developing shared terminology, processes and methodology (tools and templates).

7.3.2 Case B: Managing Offshored Product Development in the Mobile Telephone Industry

The second case focuses on the Danish subsidiary of one of the largest mobile telephone manufacturers in the world. The subsidiary (henceforth Company B) carries out all value-chain activities from the concepting phase of the mobile telephones (i.e. laying out the overarching functions of the phones as well as market segments to target) to the mass production of the phones that will be distributed and sold on a global scale. On average, 50–80 employees (mainly engineers) work on each project. In total, around 1,200 people are employed at Company B.

In 2007, the MNC headquarters of Company B decided to broaden the portfolio of mobile phones on the market. The decision was based on the belief that a diversification strategy would capture further market shares and eventually increase profits. For the Danish subsidiary, the consequence of this was that it needed to triple the number of mobile phones developed each year from approximately four to twelve. Inevitably, this caused a major capacity challenge for the management of Company B as the amount of in-house engineers and resources available was scarce. As a result, the management decided to outsource selected product development projects to a Chinese subsidiary of a large Taiwanese electronic components manufacturer.

More specifically, while the development of lead products (e.g. with breakthrough innovations) was retained in-house in Denmark, the management decided to outsource some 'copy product' projects (products with less complex technologies that have been used in previous models) to the Taiwanese client, resulting in a virtually parallel in-house and outsourced organisational set-up. A senior manager in Denmark explained this:

> It wasn't a top-down, but a bottom-up decision. The individual development sites were told that they should make X number of products, and then it was up to the local management to find out what the heck we should do. We didn't have the capacity to make all these products and our guys couldn't deliver it. We then found out that we should make some joint R&D.

The Chinese partner had been chosen for a number of reasons. For instance, besides the obvious resource-saving rationales from relocating the product development to China, the partner possessed—as one of the largest companies within the field of electronic component manufacturing—much relevant expertise and knowledge that Company B saw the potential of tapping into. Moreover, Company B had used the Chinese manufacturer as an electronics components supplier for some years prior to the full-scale outsourcing decision. The two had thus already an established relationship, which eased the process of relocating entire product development projects.

Predominantly, two types of white-collar work were affected by this offshoring decision. First, it concerned the engineering work related to developing and testing the product. The outsourced projects of 'copy products' used already developed technologies (i.e. existing keyboards, cameras, antennas). Hence, the work processes were relatively easy to dispatch to the Chinese partner while retaining a high degree of integration with the remaining organisation. Second, in order to soothe the transition process of reallocating the offshoring projects, Company B had decided to replicate its own organisational structure with the outsourcing partner and was therefore forced to also offshore the more administrative white-collar work. Due to the nature of the work as being more intellectual and creative, it was not possible to standardise the tasks and processes to the same extent as the engineering work. While the requirements for the engineering work were well documented prior to the transition, the challenge of aligning the Chinese management in charge of the offshored activities with Company B's expectations proved to require substantially more resources for control and overheads and close collaboration through measures including weekly video conferences and extensive travelling between Denmark and China. As one senior manager explained it:

> We ended up reviewing their drawings, controlling the quality, and checking whether the test results were good enough.

A related challenge was the rising concern among Danish employees (in fact, both engineers and the project manager) that the newly established parallel in-house/outsourced product development organisation would eventually undermine their future prospects in the company. As one senior manager put it:

> People in the company see it as if we are selling our core competences. On a design level, people have been very nervous and cautious towards the JRD. In the old days, it was rocket science to make good mobile phones. That's not the case today, however. Everybody can easily buy all the necessary phone components on the market. But if you have made these components internally for the last 20 years, you will think that it is still a core competence for the company.

Interestingly, however, in the years following the decision to offshore, the project management team in Denmark experienced a steep learning curve when it was necessary to optimise the organisation of remaining in-house projects to increase efficiency (e.g. improving operational issues such as time-to-market and, more broadly, improving sourcing and communication strategies). As explained by one senior manager in Denmark:

> What's going on? How can they be so fast? Working together with the supplier has actually been a kind of a wake-up call for us. They have demonstrated that they can make products that are on level with our products, and they can even make it faster than us with the same quality. This was a surprise for many in Denmark.

Thus, although the white-collar offshoring required an unexpected amount of resources regarding knowledge transfer, coordination, control and design, it has arguably not reduced or deterred domestic activities, but has in fact released resources to conduct more value-adding activities such as managing more knowledge-intensive and complex projects.

7.4 Analysis and Discussion

The case descriptions provide empirical illustrations of a process that has become increasingly common among manufacturing firms from the traditional industrial centres of Western Europe, North America and Japan. Table 7.1 summarises the key characteristics of the cases.

7.4.1 Drivers of White-Collar Offshoring

In Company A, cost minimisation and market-seeking drivers triggered the company's decision to offshore a large part of the in-house manufacturing. The initiative momentarily affected the company's procurement function, making it subject to the offshoring trends. In this case, white-collar work (buyers and top management of the procurement function) followed blue-collar work (manufacturing) due to the inherent interdependencies between these sets of value-chain activities. Effectively, the nature of the interdependences not only within but more importantly between functional units across national borders becomes crucial (Kumar et al. 2009). Company B, in response to the need to increase its capacity,

Table 7.1 Key characteristics of the cases

	Company A	Company B
Company	Producer of plastic elements construction toys	Subsidiary of world leading mobile handsets manufacturers
Function in focus	Procurement	R&D
Drivers of white-collar offshoring	Proximity to production cost minimisation	Cost minimisation need to increase capacity
White-collar jobs and tasks affected	*Local buyers* • Routine/manual work • Loose technical coupling *Global buyer/management staff* • Intellectual/creative work • Tight authority coupling	*Engineers* • Routine/manual work • Loose technical coupling *Administrative/management staff* • Intellectual/creative work • Tight authority coupling
Challenges of white-collar offshoring	*Local buyers* • Few problems *Global buyers/management staff* • Aligning domestic and offshore sites (levels of maturity, cultural distinctiveness and low commonality of purchase)	*Engineers* • Few problems *Administrative* • Aligning in-house and offshored set-up • Knowledge transfer
Integration mechanisms	*Local buyers* • Standardisation (manuals and templates) *Global buyers/management staff* • People-based/information-based (frequent personal meetings, video conferences)	*Engineers* • Standardisation (process documentation/codification) *Administrative* • People-based/information-based (frequent personal meetings, video conferences)

decided to outsource all product development (including the project management) for two of its products. On the one hand, this caused much frustration in Denmark as Danish employees (both engineers and project managers) feared this would mean the end of their work. On the other hand, the initiative prompted a steep learning curve for the existing project management team in Denmark and allowed the company to reap the benefits of 'economies of focus' on the higher value-adding activities.

The study supports the finding of some research (e.g. Lewin and Couto 2007; Kennedy and Sharma 2009; Lewin et al. 2009) that white-collar work is being offshored, just as blue-collar work has been. As the cases illustrate, to some degree this can be attributed to the dominant logic of cost reduction through offshoring and outsourcing to low-cost countries, that is, the logic that is currently commanding the attention of so many companies all over the world. Bettis et al. (1992) refer to this logic as the logic potentially leading to industrial decline and argue that outsourcing to low-cost countries is usually triggered by pressures on 'underperforming' businesses to improve cost and profit performance. For the

companies in the case studies, the impact of the prevailing industry trend towards offshoring was significant. However, this only partially explains the global dispersion of white-collar work in the case studies. In case A, the global dispersion of the procurement function was triggered by the production offshoring initiative. Overtime, the initiative escalated further and involved higher-skill-content procurement tasks. Company B increased the scope of the collaboration with the development partner overseas as experience was gained. This suggests that the virtues of white-collar offshoring in manufacturing firms go beyond the mere low-cost-driven strategies often characterising blue-collar work offshoring (Dossani and Kenney 2007). Thus, while the antecedents of white-collar offshoring in manufacturing firms possess several similarities to blue-collar offshoring, the picture is more multifaceted due to the linkages between blue- and white-collar work as well as broader societal trends driving firms to rather search for qualified labour abroad.

7.4.2 Mechanisms of White-Collar Offshoring

Perhaps more interestingly, the case narratives suggest that differences exist in integrating different types of white-collar work (routine/manual work versus intellectual/creative work). The existing literature acknowledges that one of the major consequences of offshoring is the mounting challenge of successfully integrating the globally dispersed activities into the organisational system (Ernst and Kim 2002; Henderson 1994; Kim et al. 2003). For example, Kim et al. (2003) point out that the effective modes of integration are highly dependent on the nature of the globally dispersed activities and conclude that formalisation- and centralisation-based modes of integration are less effective for globally dispersed R&D units than they are for manufacturing. The cases presented in this study advance our understanding further and illuminate how some white-collar tasks subjected to offshoring can be successfully integrated using formalisation-based mode. In both cases, the white-collar work that was characterised as manual and routine work and that was coupled to the technological flows in the organisation could to a high degree be standardised and codified through explicit work manuals, procedures and process. However, the same did not apply to the content of the white-collar work involving management tasks of a relatively high tacit and flux nature (Grant and Gregory 1997; Szulanski and Jensen 2006). For instance, in Company A, it was hardly possible to standardise the relationship between global buyers and strategic raw material suppliers; it often required intense face-to-face negotiations. Likewise, Company B experienced that it needed to closely monitor and control the performance of its offshoring partner to ensure that the work actually being done fulfils defined quality standards. Accordingly, this generic difference between the white-collar offshoring (manual/routine versus intellectual/creative) types was manifested in the challenges of integrating the tasks. For instance, an immediate consequence of offshoring the projects to the Chinese manufacturer was the

unexpected challenge of transferring the necessary knowledge to ensure that the quality of the offshored activities would meet the corporate standards and expectations.

The cases also show how the high environmental context dependency characterising the white-collar work complicates the nature of the task being offshored and its interdependences to remaining activities. In particular, when attempting to integrate the white-collar work with the manufacturing firm's activities, the cases clearly demonstrate ongoing challenges related to knowledge transfer between the geographically dispersed activities, control of the performance and outcome of the offshored activities and coordination of the activities. For instance, Company A experienced a need for continuous efforts in integrating the offshored procurement function. On the one hand, the four departments were geographically distant, and on the other hand, distinctiveness between them also revealed itself through differences in maturity, cultural differences and challenges of aligning all aspects of procurement activities exclusively through standards and templates. Company B gradually realised the appropriate modes of integration through a learning-by-doing approach. This provides interpretive grounds related to the topic of 'invisible costs' (Stringfellow et al. 2008) or 'extra-client costs' (Dibbern et al. 2008) in offshoring research, which points to the post-transitional costs and challenges of offshoring. This post-transitional unit of analysis is interesting as it points to the core of firms' dynamic capability of integrating globally dispersed knowledge-intensive business activities (cf. Eisenhardt and Martin 2000; Teece et al. 1997; Teece 2007). Said in other words, firms with a poor ability to integrate offshoring activities will encounter a higher degree of post-transitional 'hidden' costs. However, due to the relatively higher complexity of more creativity-based white-collar work, the risk of encountering hidden costs is greater.

In sum, the cases show that an impact of the decision to offshore white-collar work is the ongoing challenge of successfully integrating the globally dispersed activities. An impact of offshoring white-collar work in manufacturing firms can thus be argued to be related to the manufacturing firm's overarching system knowledge spanning over all the globally dispersed activities in organisational system. Said in other words, the decision to offshore white-collar work challenges the manufacturing firm's ability to recognise the boundaries of the white-collar work activities in order to devise appropriate interfaces and interdependences between the organisational activities. This way the companies can successfully ensure a coherent organisational reconfiguration with a reduced risk of escalating post-transitional costs relating coordination, control, design and knowledge transfer (Dibbern et al. 2008). Both case companies exemplify that to successfully manage the offshored white-collar work, they needed considerably more knowledge of the entire organisational system, which they, arguably, acquired through learning-by-doing approach. This observation supports the existing literature examining the reasons why we may expect that it is more difficult to offshore professional work than manufacturing work (e.g. Yu and Levy 2010).

7.4.3 A Conceptualisation of the Integration Mechanisms of White-Collar Offshoring

The findings suggest that white-collar work presents firms with different integration requirements. More specifically, white-collar offshoring appears to challenge manufacturing firms' ability to successfully integrate offshored white-collar activities into a concerted organisational system in another way than blue-collar activities. In this regards, it is important to point out that white-collar work is highly diverse in its content and nature; hence, the potential 'offshorability' of white-collar tasks may also be different.

According to Hopp et al. (2009), white-collar tasks can be differentiated according to how intellectual, physical, creative or routine they are. A fruitful way to differentiate between various types of white-collar work may therefore be by assessing their interdependence with the rest of the organisation. The concept of loose coupling (Thompson 1967; Weick 1976, 1982; Orton and Weick 1990) provides a useful outset for such an assessment. Two common types of coupling elements are the technical couplings that emerge between technology, task and role and the authority couplings that are found in positions, rewards and sanctions. The technical and authority couplings hold the organisation together and make up the basic infrastructure that allows firms to produce desired outcomes. Orton and Weick (1990) argue that loose coupling is a dialectical concept combining the contradictory concepts of connection and autonomy. The concept of loose coupling conveys the image of a system consisting of interdependent parts that vary in the number and strength of their interdependences. Such a system is coupled because its parts are linked, but the coupling is loose because the parts preserve a certain degree of independence and are subject to spontaneous changes. Connection and autonomy can therefore be expressed through the constructs of responsiveness and distinctiveness. The level of responsiveness and distinctiveness of white-collar tasks may vary depending on how tightly they are coupled with the 'technical core' of the primary value-chain activities. White-collar work that is tightly coupled to these activities is likely to be more responsive to the processes in the system than white-collar work that is loosely coupled and allows 'the intrusion of the variables penetrations from outside' (Thomson 1967, p. 12).

Examining global integration, that is, coordination and control of business operations across borders, Kim et al. (2003) distinguished between four integrating modes: people-based, information-based, formalisation-based and centralisation-based. First of all, people-based integration characterises coordination and control of activities through the transfer of managers, teams, committees and integrators [cf. a 'personal' type of integration (Child 1972)]. Second, information-based integration describes coordination and control through impersonal communication means such as mail, internet/intranet and electronic data interchanges and coordination through information systems (Galbraith 1973). Third, formalisation-based integration uses standardised work procedures, rules, policies and manuals to ensure integration [cf. coordination by standardisation (Thompson 1967)]. Finally,

centralisation-based integration relies on decision-making authority at the higher levels of command [cf. centralising strategy of control (Child 1972)]. Echoing the research on task interdependence [e.g. Thompson (1967); van de Ven et al. (1976)], Kim et al.(2003)] concluded that people-based and information-based integration modes were generally more effective than formalisation-based and centralisation-based modes in integrating functions globally. However, while this international business integration terminology elucidates central assumptions in the organisation of multinational enterprises—namely which modes of integration are more effective for different business functions—it does not discriminate between the type of employment being offshored.

Based on these findings underpinning the challenge of integration of offshored white-collar work, we propose a reframing of Kim et al.'s (2003) four modes of global integration. This is, on the one hand, based on the type of white-collar work being offshored (Hopp et al. 2009), and, on the other hand, the work's dependency on loose coupling as an organising principle (Orton and Weick 1990) (Fig. 7.1).

As the cases presented in this chapter demonstrate, white-collar work is not a uniform homogenous category. We can differentiate between the types of white-collar tasks based on how intellectual, creative, manual or routine they are. Employing Orton and Weick (1990) constructs of responsiveness and distinctiveness, we also differentiate between tightly coupled and loosely coupled white-collar activities.

In these cases, the management tasks can be defined as tightly coupled to the organisation because of their distinctiveness as well as continuous and relatively higher responsiveness to the realities of the organisation they originate from. As a result, it became more resource demanding and challenging to reallocate this type of white-collar work in terms of the subsequent complexity and integration. On the

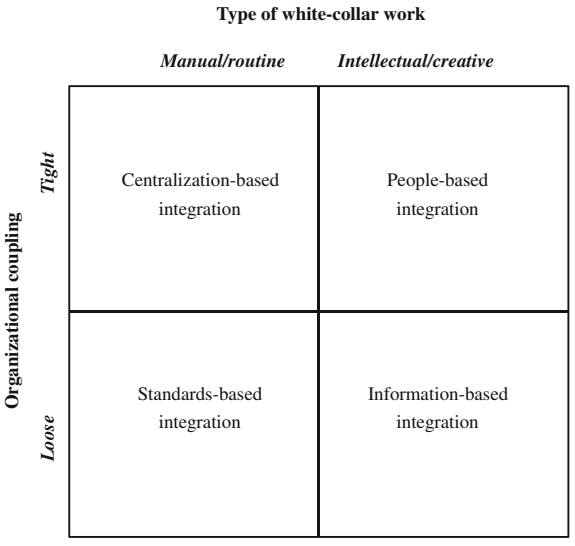

Fig. 7.1 Relating white-collar work, coupling and forms of integration

other hand, the local procurement and engineering work followed in this study can be categorised as loosely coupled to the core of the organisation. These activities are relatively more robust and irresponsive to the organisational system they originate from and can to a large extent be integrated through standardisation- or information-based mechanisms such as explicit process documentation. However, the cases also demonstrate that there may be situations when especially high responsiveness of organisational design is required, and all four forms of integration have to be utilised. On Fig. 7.1, these situations are illustrated through areas of overlap between more than one forms of integration.

This conceptualisation of white-collar work and relating it to the modes of integration creates a more intricate view of the 'offshorability' of white-collar tasks and mechanisms required to successfully integrate these tasks on a global scale. It provides complementary explanations as to why white-collar service work in manufacturing firms is becoming increasingly subject to offshoring and what are the implications of it in terms of integration mechanisms.

7.5 Conclusion

The purpose of this chapter has been to explore and discuss the phenomenon of offshoring white-collar work from the perspective of manufacturing firms. The focus of this chapter was why knowledge-intensive service work in manufacturing firms is becoming increasingly exposed to offshoring and on discovering the effects of this process on integration mechanisms in the firms involved in it.

Our findings show that the drivers of white-collar work offshoring in many respects are parallel to those of the earlier wave of blue-collar work offshoring, that is, cost minimisation and resource seeking. Moreover, this study also discusses causes which the existing offshoring and outsourcing frameworks do not necessarily adequately address. These causes are related to the interdependence of white-collar tasks with the rest of the organisation. Moreover, we find that white-collar offshoring in manufacturing firms requires a responsive organisational design and capabilities to manage it. Key means of dealing with this requirement include identifying and defining task interdependences and coordination.

We conceptualise the effects of white-collar work offshoring in a framework relating white-collar work to integration mechanisms companies instigate to manage it on a global scale. This conceptualisation contributes to the debates about the assessment of potential 'offshorability' of various types of white-collar tasks and how it can be integrated on a global scale. It provides complementary explanations as to why white-collar service work in manufacturing firms is becoming increasingly subject to offshoring and what are the implications of it in terms of integration mechanisms.

The results and conclusions of the study have several limitations. The first obvious limitation of the study is its geographical delineation. Because Denmark has been chosen as the main location of the investigation, generalisable parallels

that may exist have to be tested by replicating the study elsewhere. Second, the scope of the chapter has not allowed us to elaborate on all types of white-collar work offshoring. Because we limited the focus of the chapter to procurement and R&D functions, the basis for generalising the findings from these areas is a subject for further research. Third, the case approach used in the study involves many challenges. One potential bias of this strategy is in the selective memory of respondents. In the current study, these were offset by triangulating the interview data with related documents and records.

Despite these limitations, the complementary explanations revealed in this study for the offshoring process and its underlying mechanisms in manufacturing firms provide a basis for developing a more encompassing framework to better understand and manage the offshoring practices of firms.

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Chapter 8
SMEs De- or Reorganising Knowledge When Offshoring?

Claus Jørgensen and Christian Koch

Abstract A growing number of Danish manufacturing companies feel compelled to offshore greater or smaller parts of their organisation. Drawing on organisational theory and, the concept of knowledge governance, this chapter examines two SMEs in the textile and the furniture sector, highlighting the knowledge-management intersection. The two case studies show one SME reorganising its processes and integrating knowledge through a mainly captive knowledge governance set-up; the other deorganises, disintegrates and, to a certain extent, "compensates" with virtual organisational elements: exercising knowledge governance through IT systems as well as through the establishment of an offshored physical intermediary control element. Furthermore, both case companies work with so-called soft knowledge governance approaches, in one case through the introduction of corporate social responsibility in the new captive set-up and in the other case through the specific selection of new suppliers and their capability/competence building over time. Organisation design approaches would focus on the initial diagnosis, choice and implementation of a "new" organisation. However, the organisations studied experience emergent organisational design elements over time. Furthermore, they are involved in dynamically tackling the learning of the organisational players as well as the dynamics of their relationships with cooperating partners regarding maintaining and developing their innovation capability. To manage these challenges, both case companies choose to revisit the organisational design elements and reconfigure their organisational design set-up, indicating a need to reinstate the classic design components along with a more dynamic perspective.

C. Jørgensen (✉)
Aarhus University, Birk Centerpark 15, 7400 Herning, Denmark
e-mail: clausj@hih.au.dk

C. Koch
Construction Management, Department of Civil and Environmental Engineering, Chalmers University of Technology, Sven Hultinsgata 8, SE-412 96 Gothenburg, Sweden
e-mail: christian.koch@chalmers.se

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8.1 Introduction

The aim of the chapter is to show how the organisational design elements regarding knowledge management and governance emerge and continuously develop over time in a globalised offshore setting. The chapter will discuss this development by examining the organisational challenges regarding knowledge experienced by two SMEs competing in global markets and value chains. Each company has changed its global sourcing set-up due to a process of globalisation of their manufacturing set-up. A slice of the "original" organisation has been identified and relocated during an organisational design process.

As the globalisation of the value chain increases in complexity, the interdependency and the need for coordinating and controlling the organisation, and especially its knowledge components, with respect to the different partners in the value chain increase from the perspective of the focal company. The original design therefore enters into an emergent process, triggering a need for new organisational and managerial approaches (Jørgensen 2010). In the chapter, organisational design studies and knowledge governance approaches (KGA) are applied in the analysis of the managerial challenges of the organisations. Changes in the way the case companies choose to combine formal and informal coordination mechanisms are presented and analysed. The two different approaches taken by the case companies are shown to be viable for solving the dynamic and complex challenges facing many SMEs in today's business environment and for maintaining and developing the innovation capabilities within the new set-up. Advice for SME managers is developed based on the analysis of how the two case companies combine and design knowledge governance mechanisms differently in an increasingly complex, globalised setting of sourcing activities.

The chapter starts with a short introduction to the organisational design and virtual organisation literature and continues with a discussion of the KGA regarding both the formal/hard and the informal/soft coordination mechanisms in the integration of knowledge between relations. We then introduce our methodological approach and describe in detail how we have selected and studied the two case companies. Then follows two in-depth descriptions of the case companies, after which we delve into a discussion of the cases based on the literature review. Finally, concluding on the findings, we sum up the organisational implications found in the discussion part of the chapter and point to areas of interest for further studies.

8.2 Theory

According to traditional organisational design literature, a proper reorganisation should be initiated by a diagnosis of the current organisation followed by design and implementation phases (Cummings and Worley 2005). Typical design parameters would be control, coordination, formal communication channels and division of labour (horizontally) (Mintzberg 1993; Ensign 1998). On the basis of extant classical literature, organisational design studies have moved into more specific and currently prevalent issues. In this context, the management of knowledge in and between organisations and the use of virtual organisations as a way to solve these challenges have become parallel developments.

The notion of virtualisation has been used to both describe internal transformation of organisations and new external forms of collaboration with various partners of the company. This focus can be seen as a response to and an appreciation of the tension between an increasing element of dispersiveness of organisations and the related interdependencies. Dispersiveness could occur as singular nomads or multinational corporations being increasingly globally networked (Castells 2000; Ensign 1998). Barnatt takes a radical approach and defines a virtual organisation as an organisation which relies on cyberspace to function, which has no identifiable physical form, whose employer–employee relationship is transient and whose boundaries are defined by ICT rather than bureaucratic rules and/or contracts (Barnatt 1995) [see also Hinds and Kiesler (2002), Okkonen (2004)]. In such an organisation, intra- and inter-organisational virtualisation is mixed. IT technologies may act as a tool of transformation as well as a constraint for virtualisation. ICTs can be seen as assisting firms in the realisation of virtualisation by speeding access to as well as processing information, facilitating internal/external communication as well as linking and increasing the control over distributed organisational elements (Buser et al. 2000; Koch and Buser 2003).

The issue of handling knowledge in organisations started with the attempt to conceptualise the learning organisation and continued into knowledge creation and knowledge management (Nonaka and Takeuchi 1995; Wenger 1998; Wenger et al. 2002). A number of different organisational designs have been proposed to improve the creation of knowledge-intensive services and products, and there has been an increasing appreciation of the informal nature and tacitness of knowledge, also when attempting to transfer, translate or transform knowledge (Carlile 2004). Even if global and/or virtual organisations were discussed to some extent in this literature, the primary focus was on co-location and singular types of organisations. However, there is an increasing interest in the contemporary, disperse and international type of knowledge organisation and in how the organisational set-up of these emerging internationalised SMEs changes over time. In this chapter, we have chosen to focus on the KGA as a design element to examine closer how the formal/hard and informal/soft coordination activities of the case companies emerge/develop over a longer period of time (5 years) with the aim of involving the actors in the new set-ups of the knowledge integration processes of the “internal” innovation activities.

Foss (2007) describes the knowledge governance problem: "The KGA identifies, grapples with, and solves problems that lie in the intersection of organization and knowledge processes, problems that for various reasons are hard to approach and solve within other knowledge-based approaches or where these approaches give a different solution than the KGA". Michailova and Foss (2009) further explain the KGA: "'Governing knowledge processes' (…) means choosing governance structures (e.g., markets, hybrids, hierarchies) and governance and coordination mechanisms (e.g., contracts, directives, reward schemes, incentives, trust, management styles, organizational culture, etc.), so as to favourably influence processes of transferring, sharing, integrating, using, and creating knowledge" [see Choi et al. (2005) for a somewhat different understanding of the knowledge governance concept].

Michailova and Foss (2009) develop a fairly static approach to knowledge governance. A more dynamic approach is suggested by Scarbrough and Amaeshi (2009) who state that "it might be more important that such structures (knowledge governance) are able to change and adapt to the shifting needs of knowledge integration than pursue a best fit with circumstances prevailing at a single point in time". This interpretation points towards a more dynamic view of knowledge governance as the demands of the sourcing relations change over time due to challenges regarding how to combine formal/hard and informal/soft coordination mechanisms to achieve a knowledge governance system that fits the specific demands towards maintaining and developing the innovation capabilities of the individual organisations and their globalised value chains.

Foss et al. (2003) further divide knowledge governance mechanisms into hard and soft dimensions, where the governance practices are divided into a hard dimension—for example, contracts, directives, incentives and rewards—as well as a soft dimension—for example, communication, trust, management styles and organisational culture [an example of the application of these dimensions can be found in Peltokorpi and Tsuyuki (2006)]. We choose to follow this distinction in our analysis of the emergent developments of the two case companies to see how they, when the companies change their globalised and sliced organisational designs, differ in their combinations [in accordance with Grandori (1997) who moves from ideal-type governance and coordination mechanisms to a variety of governance and coordination mechanisms and their possible combinations] regarding both the soft and hard side of knowledge governance. The approaches chosen by the case companies suggest a more dynamic and intrinsic view on the knowledge governance design setting regarding key suppliers/captive offshore operations in connection with which the companies combine the hard and soft dimensions of knowledge governance to maintain and develop their innovation capabilities in the set-ups.

8.3 Method

The empirical investigation took the form of qualitative case studies with a longitudinal orientation (Pettigrew 1990). The case companies were selected on the basis of being globally operating SMEs in the textile and furniture industry with

considerable experience in offshore sourcing. Field methods were onsite observations, semi- and unstructure interviews and review of secondary materials. Respondents from each company were involved in commenting on case summaries, including revisions. Secondary materials from each company included annual reports, press releases, customer presentation material and stakeholder and media material. The comparative method was based on a few cases and a few events (strategic change) as a process research design (Pettigrew 1990; Van de Ven 2007) where interviews were transcribed and coded in NVivo (software from QSR International, Australia). The codes from the transcripts, the revised summaries of the interviews and the secondary material were all used to build the case descriptions.

After the first visit, the companies were revisited in the next 3 years (the first interviews of key informants used a semi-structured questionnaire, and the follow-up interviews of the last 3 years were unstructured interviews; a total of 16 interviews were conducted during the period). To identify and analyse possible scripts, Barley and Tolbert's (1997) four processes were adopted: (1) Grouping the data by category or unit of observation, (2) identifying behavioural patterns (scripts) within categories, (3) identifying commonalities across scripts and (4) comparing scripts over time.

This study shows how factors and issues change over time by employing a real-time process approach based on narrative descriptions (Van de Ven 2007). The companies appear to share similarities in their progression from offshore outsourcing to a more complex offshore constellation. The cases are seen as single entities (Van de Ven 2007) due to the fact that they are small and medium size companies; they have fairly simple organisational structures constituting a single case category.

8.4 Two SMEs Outsourcing

The cases were selected for the purpose of studying different approaches to offshore sourcing and knowledge governance in two very competitive and globalised industries. Both companies are manufacturers who started outsourcing manufacturing processes offshore for cost-reduction purposes. Furthermore, at the outset of the investigation, both companies fitted into the SME category in terms of size and both companies had survived recent turmoil in the markets, caused by what is named, the financial crisis, and had shown growth tendencies after the financial crisis.

Additionally, the case companies have seen their markets change from fairly slow-moving (working garments and durable furniture) into markets with a greater demand for continuous product innovation, leading to internal demands for process innovation as well. Both companies have made significant downstream moves and chosen to build closer ties with their consumers through the establishment of a shop-in-shop concept in case A and a franchise concept in case B, although a number of the outlets are still owned by company B. Another reason for choosing these specific cases is found in the choices made within the case companies during the period of study. Due to resource constraints before, especially during and after

the financial crisis, the companies chose to reallocate their resources in opposite directions. Case A decided to invest more resources in a captive manufacturing set-up, whereas case B chose to divest the captive manufacturing set-up and instead move its resources to the downstream activities of the company.

8.4.1 Company A

The company outsourced its sewing activities in the late 1980s to Eastern Europe as an early mover in the Central Jutland textile cluster. The organisational design set-up was fairly simple, as it kept all its activities in Denmark except the sewing activities, which were outsourced to suppliers in Eastern Europe and later on India, China and Vietnam. Recently, the organisational design set-up became more complex, as company A began to move its Eastern European activities to its own newly established production facilities in Vietnam, while retaining outsourced sewing activities in China, India and Vietnam. In mid-2009, it employed around 1,100 workers in Europe and Vietnam and had about 2,500 workers in the Far East engaged in outsourced activities. The recent change in the organisation, the establishment of own production facilities in Vietnam, reflects a wish to reduce costs as well as to improve the time-to-market of the manufactured goods. Yet another token of this wish is the physical relocation of the raw material stock from Denmark to Vietnam.

Development and quality control take place in two laboratories located in Denmark (development) and Vietnam (quality), respectively. To manage the flow of tacit and systemic knowledge between Denmark and Vietnam, the company moves key employees back and forth between the two countries for longer periods of time and a few expatriates work at the Vietnamese site. The expats play an important role as knowledge translators between the entities in Denmark and Vietnam, as does the local Vietnamese manager (a Dane who has previously held a diplomatic post in Vietnam) who is responsible for the implementation of corporate social responsibility (CSR) as a managerial tool in the Vietnamese premises. From the perspective of the company, the use of CSR has the dual function of profiling the company in the local context and establishing a lead in the ongoing recruitment battle with other international companies in the area. This focus has resulted in a fairly stable group of workers in the local setting and thus reduced the need to continually train sewing skills of new employees and increased the local knowledge stock within the company. Explicit knowledge is managed through a number of IT tools as well as different knowledge flow channels such as Skype, video conferencing and email.

The level of knowledge transfer between the outsourced, offshore production units and the company is lower, but the control function implemented by the company transfers and translates manufacturing improvements between the different sites on an ongoing basis. Part of this knowledge is also made explicit in the company's own IT systems. Recently, the company has offshored the cutting-out process (drawings) to Vietnam; initially, the process was constantly monitored via

IT by a Danish employee. This control function has now been rendered redundant because of an increase in the knowledge stock and understanding among key employees (Vietnamese, not expats) on the premises in Vietnam.

The knowledge governance structure of the company has changed, most notably with the captive establishment of production, quality control and warehousing in Vietnam. In doing so, the company has increased its capacity to manage both formal/hard and informal/soft coordination mechanisms across its development, sales and marketing activities in Denmark and its other activities in Vietnam (mainly manufacturing, but also quality control and basic marketing tasks). Furthermore, the demands towards the external coordination mechanisms of the company regarding its outsourced production activities have diminished, as the more difficult and complex production activities are now handled by the company's captive Vietnamese activities. During the period of study, the company has reversed its strategic goal of 30 % in-house offshore production and 70 % offshore outsourced to a goal of 70 % in-house and 30 % outsourced offshore sewing activities, indicating a need for further investments in the local captive manufacturing set-up; investments that were initiated in the spring of 2011.

8.4.2 Company B

Company B has recently changed its strategy and organisational design set-up from only producing furniture to include retailing. It has also reduced its ownership of the production units (offshore outsourcing) in the same process. At the beginning of 2009, the company had around 560 employees in Denmark and abroad.

Furniture production involves two product groups: Upholstery and flat-pack furniture. A few years ago, the company decided to change its organisational design set-up and outsource the production of upholstery furniture because the skills required in the upholstery field are less demanding and more labour-intensive compared to those of the flat-pack area. The flat-pack furniture department was not outsourced due to high flexibility and quality demands of the production process, lack of competent suppliers in Eastern Europe and Asia as well as the historical path of the company.

As part of the new organisational design, the upholstery production unit in Denmark was bought by the former management and moved to Lithuania to reduce labour costs. Today, the company cooperates closely with this supplier in terms of innovative activities, since the facility is still run by the old management group from Denmark. This facilitates knowledge integration between the units due to the high level of tacit knowledge still present in the outsourced company. As part of the new and more dispersed organisational design set-up, the company uses an external design company to develop new designs together with the suppliers and the company's own product managers. This entails physical relocation of designers and product managers, since they join the local manufacturing staff in the different production units (both in Lithuania and China) to discuss new designs and how to produce them at the factories.

Physical movement is preferred due to the difficulties of translating tacit knowledge virtually between employees, suppliers and sites.

The company's other main supplier of upholstery furniture is located in China. Because the Chinese suppliers in general lack knowledge and understanding of the company's quality demands due to an initially inadequate level of absorptive and learning capacity as well as cultural differences, the company decided to make additional changes to the organisational design set-up by establishing a control unit in China and hiring local quality employees to function as the case company's quality controllers in each supplier factory. This organisational design set-up has recently been extended by the establishment of a second Chinese control unit geographically dispersed from the other control unit to achieve physical closeness to other key suppliers as well as its newly established warehouse activities.

The company is now sourcing more activities from the control units in China and has outsourced and geographically condensed its warehouse activities, previously managed internally in Denmark and Japan, to a new supplier in China. The company transfers Danish employees to the control units in China for longer periods of time to train and work with local employees. Chinese employees are located to Denmark for short-term training to transfer both tacit and explicit knowledge and attempt to translate the company's organisational culture into a Chinese context. The local expats function as knowledge translators in the interaction between the Chinese suppliers and the Danish entity. To a certain level, the company's product managers also assume the role of knowledge translators with the Chinese suppliers in the development activities, whereas their translation role is somewhat reduced regarding the Baltic supplier due to the higher level of tacit knowledge present at this supplier's Baltic site (Danish expats and managers at the supplier end).

In its search and selection of the key suppliers in China, the company has chosen a more soft governance approach regarding the development of the suppliers' knowledge and skill bases. The company considers building the Chinese suppliers' competences over time its own responsibility, as it strategically prefers to identify suppliers with developmental perspectives and sizes matching its own, thereby putting itself in a position to establish itself as an important customer in the new supplier's perspective.

The company has devised its governance activities differently in the Baltic States compared to Asia due to differences in knowledge stock and understanding. In the Baltic States, the company relies heavily on informal/soft coordination mechanisms due to its prior connections with the management team of its upholstery supplier. In Asia, the company has established its own control units to govern and control especially quality and delivery issues based on more formal/hard coordination mechanisms. It has established some informal/soft coordination mechanisms with its key upholstery supplier as well, but not at a level that equals the relation established with the Baltic opponent. The Danish mother company is continuously working with improving both the more formal/hard coordination mechanisms with its suppliers as well as the internal and partly informal/soft coordination mechanisms with the captive control units in Asia to improve the knowledge transfer, sharing and integration between the entities.

8.5 Discussion

Both case companies have managed to navigate through the recent crises and are once again picking up speed regarding growth in sales and financial results. According to the representatives of the case companies, part of this success is closely connected to the upstream moves they have made during recent years; however, it is not isolated to these moves, as both companies have made significant moves downstream as well. In total, both companies have witnessed significant changes in their value chain over the last 5 years—a period of time during which organisational and managerial demands have become much more complex and globalised. These changing settings intensify the demands towards both the formal/hard as well as the informal/soft coordination activities. This is especially the situation regarding the management of knowledge of both companies' supplier bases to maintain and develop the case companies' innovation capabilities in the new and sliced organisational design set-up. However, the two case companies have taken different and, to some extent, crossing paths to steer clear of the perilous waters of the recent crises (in economic terms, both companies performed very well in the latest financial year).

By establishing its own production facilities to be able to manage the more complex production activities, company A has chosen to depart from a long trajectory of not having any ownership of its production activities. Here, we witness a reorganisation that involves integrating new elements in the virtual organisation. Through this move, the company has gained partial control of its production activities and the possibility to conduct 100 % quality control of its products, those produced in-house as well as those sourced through the established number of suppliers in the region. Furthermore, the demands towards formal/hard coordination with suppliers have diminished due to the sourcing of less complex products from the suppliers, the in-house production of the more complex products and the in-house capability of producing smaller quantities on a shorter-term basis. The informal/soft coordination activities have been improved within the boundaries of the organisation because of the movement of personnel back and forth between Denmark and Vietnam. CSR is introduced in Vietnam to reduce personnel turnover and the continual development of IT solutions and communication tools to improve the dialogue and the type of knowledge being transferred and translated between the premises. Furthermore, the use of knowledge translators between the offshored and domestic activities has been crucial in combination with the above-mentioned developments in maintaining and increasing the product innovation rate in the company.

Company B, on the other hand, has been dissolving its own production activities and increased dramatically the number of products sourced, mainly in Asia and the Baltic States. To manage the increasing complexity, which is triggered by the number of different products being sourced, as well as the number of suppliers dispersed geographically, the company has chosen several paths. In the case of the Baltic connection, company B has mainly relied on informal/soft coordination mechanisms based on the close relationship with the supplier's management team

consisting of former employees of company B. In the Chinese region, the company has chosen to establish a number of control units close to the key suppliers and to position its own local quality personnel at the key suppliers, thus depending on more formal/hard coordination mechanisms to manage the transfer of knowledge. This places demands on the knowledge translators (expats) based at the control units as well as on the product managers who are being flown to the different premises of the suppliers to mainly initiate, together with the external designers, the new product development work.

At the same time, the company is incrementally trying to use informal/soft coordination mechanisms to continuously build competences within the new key suppliers in China. This to further develop and improve the suppliers' ability to receive and translate knowledge from the case company regarding mainly manufacturing skills, quality understanding and, in a single case in China, the process innovation skills of the supplier.

The organisational and knowledge governance changes can be summarised as shown in Table 8.1.

Table 8.1 Changes in organisational and knowledge governance dimensions

	Case A	Case B
Organisational changes	Insourcing of the more complex sewing activities in Vietnam increases the control of both production and quality, which in turn is expected to facilitate offshoring of more complex activities, like construction of designs, at a later stage. Options being considered to facilitate vertical integration to include acquisition of a dye plant. A move from a mainly market-oriented governance set-up towards a hybrid governance set-up	Outsourcing of the less complex upholstery production to the Baltic states and China. Establishment of several control centres in China over time to create a physical link between headquarters and key suppliers that also creates indirect control between headquarters and key suppliers in China. A move from a hierarchical governance set-up towards a hybrid governance set-up
Knowledge governance hard dimensions/formal coordination	Captive production unit in Vietnam taking over more and more complex manufacturing activities. Continuous development of IT tools to support the link between headquarters and the Vietnamese entity regarding mainly formal knowledge	Continuous development of IT tools to support the link between headquarters and the control centre regarding especially formal knowledge

(continued)

Table 8.1 (continued)

	Case A	Case B
Knowledge governance soft dimensions/ informal cooperation	Increasing physical movement of personnel back and forth between Denmark and Vietnam, thus moving less transferable and robust knowledge, such as organisational values and norms. Furthermore, a dye expert is hired to help a key supplier, initially in Vietnam, then in Pakistan. Increasing use of expats as knowledge translators at the Vietnamese entity and application of CSR to reduce personnel overturn and thereby maintain and develop the local knowledge stock	Increasing physical movement of personnel back and forth between Denmark, the Baltic states and China, thus moving less transferable and robust knowledge, initially in the product development process and later within manufacturing, warehousing and logistics (China). Strategic positioning of expats in control centres to act as knowledge translators as well as to continuously help the local suppliers build their manufacturing capabilities and quality understanding

8.6 Conclusion

During the last 5 years, both case companies have been working with changing their organisational and knowledge governance set-up, adjusting both the soft and hard knowledge governance dimensions to improve the capability within their value chain to integrate knowledge and maintain and develop their innovation capability within the offshored set-up. This has been done using traditional, formal/hard organisational coordination mechanisms, virtual coordination and communication mechanisms as well as informal/soft coordination mechanisms. Moreover, the paths chosen by the two case companies are very different and they cross, to some extent, each other in the chosen governance set-up over time, which implies that there is more than one possible path to follow when trying to govern knowledge within dynamic, globalised sourcing set-ups. The cases also demonstrate that combining both formal/hard and informal/soft coordination mechanisms is an ongoing challenge, and both companies demonstrate that it is sensible to include both approaches in the continuous management of the sourcing activities within the value chain to maintain and develop the innovation capability within the emerging set-ups.

The chapter has highlighted the role played by the organisation of the knowledge component in maintaining and developing innovation capabilities. One organisation reorganised its processes and integrated new knowledge, the other deorganised and "compensated" with a moderate, virtual organisational element, both cases emphasising the knowledge governance element over time. Moreover, organisational design approaches tend to overemphasise the initial diagnosis, choice and implementation of a "new" organisation (the design fallacy). As

demonstrated, the organisations are emergent over time and involved in dynamically tackling the learning of the organisational players as well as the dynamics of their cooperation partners, visiting the organisational design elements more frequently to improve their upstream value chain set-up. In the cases, no significant development towards a pure virtual set-up (Barnatt 1995) without physical forms can be detected; on the contrary, both cases seem to need the direct interaction between organisational unit members through physical co-presence: In case A through the reorganisation and establishment of a captive set-up in Vietnam and in case B through the establishment of control units to support the deorganisation of the manufacturing set-up caused by the previous offshore outsourcing moves made by the company.

Furthermore, from the perspective of the focal company, a consequence might be that they should be more aware of how the hard and soft issues of knowledge governance are combined to support and link the actors together in the new organisational offshore set-up in the effort to maintain and develop the innovation capabilities within the emerging set-up. A key development here has been the continuous and growing use of expats as knowledge translators, which, in both cases, initially was seen as a temporary set-up to bridge knowledge between the entities. However, these positions have apparently become permanent part of the set-ups and have even been extended by more expats being positioned in the captive set-up in case A in Vietnam and in the established control centres in China in case B.

Being SMEs, both case companies seem to be continuously challenged by how the allocation of a limited amount of resources in their global value chain set-up is combined appropriately, thus indicating a need for SMEs to be open to changing the set-up of their organisational design elements more frequently. Several areas of interest for further research can be identified based upon this indication. In the chapter, we have chosen to focus on the upstream activities of the case companies; however, a downstream focus would point towards the way the knowledge governance structure evolves in this area concerning both the development of the organisational design set-up and the dynamic or static set-up of the informal/soft and formal/hard coordination activities in the case companies. This and the fact that the two case companies have chosen different trajectories in this area indicate that the connection between the sourcing and distribution set-up and the way the organisational design set-up of the entire global value chain evolves in a knowledge governance perspective would be an interesting area to study in more detail in the future. Yet another interesting area for further studies would be the managerial implications of the changing organisational set-ups and trajectories; more specifically, how the directional control and organisational routines are combined and put into play to integrate knowledge and create close cooperation between the actors.

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Chapter 9
The Dual Role of Subsidiary Autonomy in Intra-MNC Knowledge Transfer

Peder Veng Søberg and Brian Vejrum Wæhrens

Abstract *Purpose* The purpose of this chapter is to explore the effect of subsidiary autonomy on intra-MNC knowledge transfers during captive R&D offshoring to emerging markets. Design/methodology/approach: A framework to this end is outlined and illustrated in relation to four cases of captive R&D offshoring to emerging markets. *Findings* Subsidiary autonomy has a mainly negative effect on primary knowledge transfer and a mainly positive effect on reverse knowledge transfer. Newly established R&D subsidiaries in emerging markets need primary knowledge transfer in order to build up their competence before they can add to the knowledge level of the MNC. Gradual increase in R&D subsidiary autonomy is thereby beneficial for subsidiary innovation performance.

Keywords Captive R&D offshoring · Subsidiary autonomy · Knowledge transfer · Innovation performance

9.1 Introduction

As well as there is a need for further research concerning the whole process of outsourcing, rather than just the preparation and planning stages of the phenomenon (Hätönen and Eriksson 2009), the whole process of offshoring is worthy of further

P. V. Søberg (✉) · B. V. Wæhrens
Aalborg University, Center for Industrial Production, Fibigerstræde 16,
9220 Aalborg Ø, Denmark
e-mail: pvs@production.aau.dk

B. V. Wæhrens
e-mail: bvw@production.aau.dk

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exploration. By means of longitudinal case studies, this chapter can be seen as a reply to the calls for further research concerning subsidiary evolution (Birkinshaw and Hood 1998) including the long-term indirect effects in relation to subsidiary evolution (Dellestrand 2010, p 78); however, in particular, the premises of this chapter is to better understand drivers of captive offshoring performance for R&D activities established in emerging markets with a particular focus on the role of subsidiary autonomy. Recently, a surge of foreign R&D investments have taken place in emerging markets such as China (Harryson and Søberg 2009) and India (Pillania 2005), and many companies are considering to make similar investments.

Different types of R&D offshoring are important to investigate. Although companies today are likely to offshore core activities, they are unlikely to outsource them (Dossani and Kenney 2007). There is some support to the thesis that offshore R&D outsourcing, as well as captive R&D offshoring is beneficial for innovation performance. However, we also find some support for the thesis that captive R&D offshoring is more beneficial for innovation performance than offshore R&D outsourcing (Nieto and Rodriguez 2011). Hence, it may be particularly interesting to look at captive R&D offshoring. These results are, however, still based on rather weak signals, and there is a clear need for further research. This need is particularly clear when we start to look at the drivers for innovation performance. Successful innovation is not secured simply by deciding to carry out captive R&D offshoring, but must be found in the process of establishing innovation capabilities in a global context. In particular offshoring of knowledge-intensive business activities, such as R&D, brings about the necessity to better understand the dynamics of knowledge transfer back and forth between R&D headquarters and R&D subsidiaries.

The level of national development influences the benefit of reverse knowledge flows from subsidiary to headquarter (Ambos et al. 2006). Although this notion may be reasonable, it seems clear that not only the county's level of development is influencing the preconditions for knowledge transfer. For example, subsidiary autonomy is also likely to have important implications for intra-MNC knowledge flows such as primary—and reverse knowledge transfer. Few studies have investigated the implications of subsidiary autonomy on intra-MNC knowledge flows. This topic is important because the innovation performance of MNCs increasingly depends on offshored R&D subsidiaries, and thereby implicitly on efficient knowledge transfer between headquarters and offshored subsidiaries. This chapter therefore sets out to investigate the following research question: what is the role of R&D subsidiary autonomy in relation to intra-MNC R&D knowledge flows during captive offshoring?

A knowledge transfer perspective is applied, since this is particularly relevant in order to understand the role of subsidiary autonomy, and how it relates to knowledge flows within MNCs. The outline of the chapter is to present a framework relevant to this end, followed by brief description of the methodology. The empirical part illustrates the theoretical framework, which is subsequently utilized in the analysis, before relevant conclusions are presented.

9.2 Theoretical Framework

9.2.1 Knowledge Transfer

Knowledge transfer can be defined as "a process in which an organization recreates and maintains a complex, causally ambiguous set of routines in a new setting" (Szulanski 2000, p 10). Argote et al. (2003) argue that knowledge transfer can be organized according to three properties of the knowledge management context: properties of units (e.g., an individual, a group or an organization), properties of the relationships between units and properties of the knowledge itself. Within each of these dimensions, the literature is ripe with discussions of key elements known to facilitate and/or disrupt the performance of the knowledge transfer processes (Grant and Gregory 1997; Easterby-Smith et al. 2008).

In this article, we extend this perspective by discussing knowledge transfer in the context of R&D networks and thus extend the focus from knowledge transfer as discrete occurrences to repeated cycles of knowledge flow. Knowledge flows to and from a subsidiary can be categorized as primary, secondary and reverse knowledge transfer. Primary knowledge transfer is the transfer of knowledge from headquarter to the subsidiary, secondary knowledge transfer is the transfer of knowledge between subsidiaries, and reverse knowledge transfer is the transfer of knowledge from subsidiary back to the headquarter (Buckley et al. 2003). In simple terms, primary knowledge transfer is related to replication, it is about exploiting existing knowledge and it is successful when broadly equivalent outcomes are realized by similar means (Baden-Fuller and Winter 2005). Secondary knowledge transfer takes place between the subsidiaries and between the subsidiary and its partners, for example, in relation to local sourcing or the sharing of best practices. This chapter, however, extends this by also including reverse knowledge transfer and continuously expanding the available knowledge base to the scope of a successful knowledge flow in the MNE. The reverse knowledge transfer process is the key to sustaining the position of the headquarter as the orchestrator of knowledge in the MNE.

Not all reverse knowledge transfer is beneficial. In particular with newly established R&D in emerging markets, this may often be the case. Benefit may be defined as *the overall value of the knowledge transfer as perceived by headquarters* (Ambos et al. 2006, p 297). This has a dimension of perception to it; that is, change requests are rarely received with great enthusiasm at headquarters as they often demand changes in documentation, procedures and routines and maybe more importantly because they may point to deficiencies originating at headquarters. Similarly, not all primary knowledge transfer is beneficial. Beneficial primary knowledge transfer thereby concerns the overall value of the knowledge transfer as it is perceived by the subsidiary; here, we often find factors such as the not-invented-here syndrome, lack of absorptive capacity leading to knowledge spill over or lack of appropriateness of knowledge due to particular contextual factors. Although it is relevant to distinguish between primary knowledge transfer

and reverse knowledge transfer, it is also relevant to pay attention to the interrelationships between the two. For instance, the success of and characteristics of primary knowledge transfer is likely to determine the success of reverse knowledge transfer (Buckley et al. 2003).

9.2.2 Subsidiary Autonomy

The relationship between corporate headquarters and offshore subsidiaries in multinational firms is well established (e.g., Prahalad and Doz 1987; Bartlett and Ghoshal 1989; Nohria and Ghoshal 1994) as is the relationship between corporate headquarters and the strategic business units in diversified firms (Gupta and Govindarajan 1986, 1991). One of the key sentiments of these perspectives is the importance of "fit" between the context of the subsidiary or the business unit and the governance structures and managerial systems used to manage them. This means that different strategic roles of the subsidiaries or business units require different governance structures and management systems. A similar logic can be applied to the relationship between a business unit headquarters and individual plants in a multiplant network (Bartlett and Ghoshal 1993).

From this follows that specialization is a key driver of network performance, but with specialization comes a certain coordination demand, which may be described through different types of interdependencies. Van de Ven et al. (1976) define interdependence as the extent to which units of an organization are dependent upon one another to accomplish their tasks. From this perspective, interdependence depends on the inherent nature of work flow and can be split into: (1) pooled; (2) sequential; (3) reciprocal (Thompson 1967). Van de Ven et al. (1976) extend the classification by adding the team interdependence type, which refers to the case of interdependence when the work is acted jointly and simultaneously without measurable breaks in the flow of work between responsible parties. The four types can be ranked according to increasing levels of interdependence, the pooled type having the lowest level of interdependence, followed by sequential, reciprocal and the team types. Different types of interdependence require different means for achieving coordination (Thompson 1967; King 1999). According to Van de Ven et al. (1976) pooled interdependence, characterized by lower relationship intensity, can be coordinated by standardization, while the sequential type calls for planning, and in the intensive interdependence types, that is, reciprocal and team, coordination is achieved by constant transmission of information, feedback and mutual adjustment.

Taking the outset in these task interdependencies, Kuemmerle (1997) distinguishes between two types of foreign R&D sites each satisfying a different need. On the one hand, the "home-base-augmenting laboratory site," with the objective to absorb knowledge from the local scientific community, creates new knowledge and transfers it to the homebase, thus augmenting the initial competencies of the central R&D site. The other type is referred to as the "home-base-exploiting site,"

which commercializes knowledge that is transferred from the central R&D site at home, to the laboratory site abroad, to local manufacturing and marketing, basically exploiting the central R&D site competencies. The type of R&D site will determine its location decision close to local competence centers or manufacturing and marketing locations. In both configurations, the homebase tends to remain the center of activity as it sets the standards and remains the central node in the network leaving little local autonomy to offshore subsidiaries.

Maturity is an important aspect of establishing offshore subsidiaries. Eppinger and Chitkara (2006) note that companies tend to deploy a global development strategy in stages, allowing them to gain experience gradually by moving more and more development responsibilities to new foreign units. In the process of upgrading, the strategic role of subsidiaries international coordination and process management follows as a means for increasing efficiency and effectiveness in the emerging global network.

9.2.3 Autonomy and Knowledge Transfer

It is clear that interdependence and autonomy are interlinked and that they are important in relation to the effectiveness of knowledge transfer within multinational companies. However, previous studies have largely neglected the dynamic interrelationships between the concepts. Various studies have investigated how subsidiaries can increase their autonomy. These studies have, for example, established that there is an inverted-U-shaped relationship between subsidiary size and subsidiary autonomy (Johnston and Menguc 2007). This means that size and autonomy is only correlated to a certain point, above which increases in subsidiary size result in decreases in autonomy.

Using data from seven developed countries in Europe, Foss and Pedersen (2002) found that interdependence between units is important for the transfer of internally produced subsidiary knowledge, whereas subsidiary autonomy is particularly important for the transfer of knowledge originating from local clusters a subsidiary has tapped into (Foss and Pedersen 2002). However, interdependence and autonomy are interrelated concepts in the sense that it is difficult to imagine a subsidiary which is interdependent with headquarters without having some autonomy of its own. When establishing a new R&D subsidiary in emerging markets, the goal may often be that the subsidiary becomes an interdependent unit; however, for this goal to be attainable, the subsidiary is likely, sooner or later, to need some autonomy in order to become interdependent with headquarters. But the questions of how to develop subsidiary autonomy, how much autonomy to grant and when, in the offshoring process, are not entirely trivial.

The findings of Foss and Pedersen (2002) are likely to be relevant for establishments of R&D subsidiaries in emerging markets in the sense that the autonomy a subsidiary is granted should enable the subsidiary to reap the benefits of its location. In particular, it should enable the subsidiary to tap into local clusters of

knowledge, as these may be unfamiliar and difficult to reach for the R&D homebase. It is, thereby, important that the subsidiary has the autonomy to identify and to carry out collaboration with such knowledge clusters, which may result in beneficial reverse knowledge transfer, as illustrated in Fig. 9.1. In this sense, R&D subsidiary autonomy may have positive effects for reverse knowledge transfer. However, before reverse knowledge transfer can take place, primary knowledge transfer is most often needed, in particular in relation to newly established R&D subsidiaries in emerging markets (Søberg 2010). If too much autonomy is granted to the newly established R&D subsidiary early on, it may instigate too much redundant knowledge creation, rather than building on existing knowledge within the company. In other words, it may hamper primary knowledge transfer and the upgrading of skills, knowledge levels and capabilities, which the R&D subsidiary needs in order to contribute to innovation performance, as outlined in Fig. 9.1.

Figure 9.1 above summarizes the theoretical framework and proposes that R&D subsidiary autonomy has a negative effect on primary knowledge transfer, and a positive effect on reverse knowledge transfer, as illustrated in Fig. 9.1. Newly established R&D subsidiaries in emerging markets need primary knowledge transfer in order to build up their competence before they can add to the knowledge level of the MNC in terms of beneficial knowledge transfer. Gradual increase in R&D subsidiary autonomy is thereby beneficial for subsidiary innovation performance.

In line with the literature presented above the framework outlined here advocates a gradual increase in autonomy for newly established R&D subsidies in emerging markets. The reader may, therefore, assume that the underlying message is to focus exclusively on the knowledge level and maturity level of the subsidiary as a determinant of how much autonomy a subsidiary should have. However, this simple determinism is not likely to be beneficial as none of the determinants are fixed and because of the repeated nature of knowledge flows within the R&D network. As we have leant from the literature above, the role and the type of activities in the subsidiary remain important aspects to consider in this context as well. R&D subsidiaries with largely local mandates such as "local for local" (Bartlett and Ghoshal 1990) R&D subsidiaries focusing on adapting products to

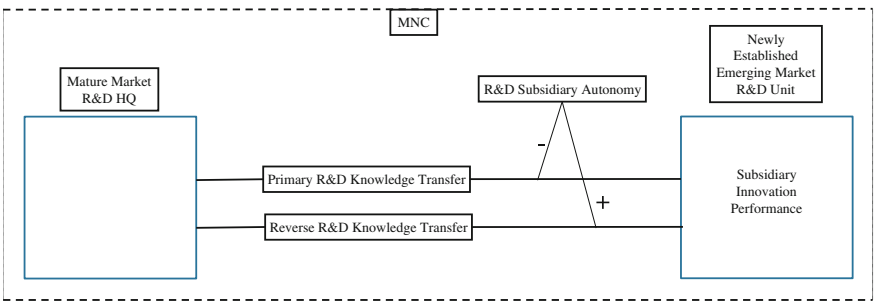

Fig. 9.1 The dual role of R&D subsidiary autonomy in relation to intra-MNC knowledge flows

the local market, or developing new products and services specifically to the local market, may be in need of more autonomy, and interdependence with the R&D homebase may be less important compared with other types of R&D subsidiaries. For example, "locally-leveraged" and "locally-linked" (Bartlett and Ghoshal 1990) R&D subsidiaries in emerging markets that are mainly preoccupied with assisting a R&D homebase in carrying out R&D for the global market could be a contrasting example. If a newly established R&D subsidiary in emerging markets serves as sort of low-cost R&D subsidiary for the world, it may be more important than in the former example to integrate and create interdependencies with the R&D homebase. In other words, an implicit part of defining the autonomy of an R&D subsidiary relates to the characteristics and the clarity of its particular role.

9.3 Methodology

Extensive qualitative empirical material have been collected from four Scandinavian high-tech companies and are reported in four exploratory case studies (Yin 2003) of captive R&D offshoring in China and India. In the case selection, it was emphasized that it was possible to get good access to the cases, that the companies are leading high-tech companies, who have recently established R&D subsidiaries in China or India. It was also emphasized that the case companies come from different industries that are of importance in Scandinavia.

It is believed that rich contextual information is pertinent to facilitating a rich understanding of the phenomenon as we have quite extensive knowledge of drivers of global R&D, but do not fully understand the process related to how it is operationalized. The abductive approach (Alvesson and Sköldberg 1994; Dubois and Gadde 2002) is the methodological strategy for this inquiry where more than 50 in-depth interviews have been made, since 2007. The interviews generally lasted between 45 min and 1.5 h. Empirical data have been collected in both headquarters and subsidiary as recommended by Ambos et al. (2010) as well as Dellestrand (2010) in order to be better able to investigate the interactions between headquarters and subsidiaries and how this evolves over time during the captive R&D offshoring process. Empirical findings triggered a search for theory and theory development through continuous interchange and pattern matching (Yin 2003) between empirical data and theory. This took place in order to secure good empirical support for the theoretical framework. The interviewees are mainly employees within the R&D organizations of the case companies. Interviews have been carried out in person and by telephone, both in Scandinavia and Asia. Employees on different management levels as well as employees without management responsibility have also been interviewed. This has been done in order to get as close as possible to the important problems, as well as in order to enable triangulation of data across managerial levels.

9.4 Empirical Findings

9.4.1 Med Tech

The company started the R&D subsidiary in China in 2001. It was the first R&D subsidiary set up by the company abroad. Subsequently, two other R&D subsidiaries were established in the US. One of these is still running, and seemingly doing very well. However, the other one has been shut down again. In China, the main focus of the R&D subsidiary is to carry out biopharmaceutical research activities together with the R&D homebase. The activities span many different types of diseases; however, they mainly center around treatments where the company can leverage its expertise concerning proteins. Important reasons behind the establishment of the R&D subsidiary in China was to comply with informal request from Chinese authorities to not only sell products, but also develop products in China, as well as Med Tech wishes to be better able to recruit talents from China. This especially concerns Chinese returnees with experience from overseas, who prefer to live in China.

9.4.1.1 Subsidiary Autonomy

As mentioned above, the company established an R&D center in the US, which was subsequently closed down again. A key learning from this experience within the company was that the R&D center was not proper aligned with the rest of the company. The R&D center in the US had become excessively self-organized. The activities were not sufficiently aligned with the activities of the rest of the company.

A vice president located in Scandinavia had the overall responsibility for the establishment of the R&D subsidiary in China. He ensured that, from the very beginning, a local Chinese management team was in place in the R&D subsidiary in China. He also ensured that scientists in the R&D homebase, who were skeptic toward the R&D internationalization, became directly involved in the efforts to integrate the new R&D subsidiary. Initially, employees in the R&D subsidiary found their role a bit unclear. It was difficult to know whether to go ahead in a self-organized manner or whether it would be best to only collaborate closely with the R&D homebase in Scandinavia. For instance, the R&D subsidiary independently took charge in relation to setting up the local quality processes and procedures, only to discover later on, that it would have been better and easier to utilize the already established processes in the R&D homebase. Such experiences clarified the benefit of close collaboration with the R&D homebase. The role of the R&D subsidiary is to contribute to R&D projects in terms of protein expression and purification. This takes place primarily in earlier stages of drug development.

In 2001, the activities in the Chinese R&D subsidiary pertained only to one of the two divisions of the company. In 2008, a group, which is part of the other division of the company, was established in China, as part of the R&D subsidiary. Currently this group contains 25 % of the employees of the R&D subsidiary.

Gradually, the R&D subsidiary is taking a more and more independent role concerning different technologies. The R&D homebase no longer needs to be involved in the decision when research associates in the R&D subsidiary are promoted to scientists.

Still, the R&D homebase has much influence on the activities of the R&D subsidiary. Usually, employees in the R&D subsidiary take part in projects, which are managed in Scandinavia. Currently, employees in the Chinese R&D subsidiary participate in two-thirds of ongoing R&D projects within the biggest division of the company. During the last two years, the R&D center has had the mandate to initiate projects independently. This has so far happened once, which means that one R&D project is now run out of China with a Chinese project manager. Also, the R&D center has now been given the mandate to run a "mini pallet," which maybe will enable the R&D center independently to prepare projects to be taken over by downstream people. The R&D subsidiary is thereby included in a broader spectrum of activities than previously. So far, R&D personnel in the R&D homebase have always been involved to evaluate whether processes developed in the R&D center were mature enough to be handed over to personnel dealing with downstream maturation of manufacturing processes in the R&D homebase. This may change in the future, so that this step may become redundant.

9.4.2 Wind Tech

The company develops and manufactures components for wind turbines. It is particularly blades the company is focusing on. Five years ago, the R&D subsidiary was established in India covering a broad range of activities. Employees in the R&D subsidiary are among other things preoccupied with finite element analysis, construction, structural design, aerodynamics, quality control processes and (six sigma) reliability. The most advanced R&D and testing of concepts takes place in Scandinavia. Most of the resources in the R&D subsidiary are allocated to global projects, which are not specifically targeted at local needs.

9.4.2.1 Subsidiary Autonomy

The role of the R&D subsidiary is to a large extent to support R&D activities ongoing in other locations within the company, especially in Scandinavia. Initially, the often calculation heavy tasks, which were carried out in the subsidiary, were somewhat loosely specified from the Scandinavian side. The resulting calculations carried out by the R&D employees in the Indian R&D subsidiary were initially often not of a good enough quality, according to the Scandinavian R&D employees. The Scandinavian R&D employees felt that often these calculations somewhat disregarded the context in which these calculations should be used. Hence, among engineers in the Scandinavian part of the R&D organization of the

company, it is the experience that the Indian colleagues need clear specifications and subsequent control of their work. The engineers in India, however, find it necessary to educate the Scandinavian engineers concerning how to read out, for example, reliability reports carried out in the Indian R&D subsidiary. As a consequence of these initial problems, the tasks carried out in the Indian R&D subsidiary are now pretty clearly specified, and specialized. The clear specification of tasks complies with the apparent Indian preference "for being told what to do"; however, in the R&D homebase, this is also seen as an inhibiting factor. It leaves fewer opportunities for the Indian R&D subsidiary to train the ability to take on more challenging projects.

The R&D activities in the subsidiary are still tightly controlled from Scandinavia. For instance, all chief engineers are located in Scandinavia. Local engineers in the R&D subsidiary in India interpret this as if it is the goal to keep all the authority in Scandinavia even though the number of employees in the Indian R&D subsidiary is growing rapidly.

Concerning minor projects, the R&D subsidiary in India is starting to have a leading role. Already in 2010, the propensity of the Indian engineers to file patents, was just as high as the Scandinavian engineers, when it is taken into consideration that there are still fewer engineers in the Indian R&D subsidiary, than in the R&D homebase in Scandinavia. Quite a few of these inventions relate to areas beyond the specified tasks of the inventors in India. Some of the employees in the R&D subsidiary work extra hours in order to be able to work with more creative challenges beyond their specified tasks. In 2010, engineers in the Indian R&D subsidiary came up with a new and better way to carry out warranty calculations in relation to the products of the company. In the same year, the responsibility for improvement and validation of repair solutions was appointed to the Indian R&D subsidiary.

Local universities have not been leveraged much yet, even though good opportunities exist for local industry–university collaboration, according to personnel in the R&D subsidiary. It is a goal for the local Indian management group to increase such efforts when possible.

9.4.3 Pack Tech

The company is active within the packaging industry in relation to packaging material as well as packaging equipment. The activities of the R&D subsidiary, which was set up in China five years ago, relate to both of these areas.

9.4.3.1 Subsidiary Autonomy

Within the first year of the R&D subsidiary's existence, it was up to the subsidiary to take initiative and participate in different projects. This had implications for the development of the local engineers and the benefit of the training they received, as illustrated by the following quote:

> I would say in the first year the company did not really know what we were lacking (Interview 09.09.2011, Mechanical designer).

The responsibility for the Chinese R&D subsidiary was initially shared between the whole R&D homebase management. The R&D subsidiary manager proposed to change this to a situation where only four people in the R&D homebase management group would have the responsibility for the R&D subsidiary in China. This proposal was not approved; however, instead, the responsibility was divided between five different areas in the management group, whereby the R&D subsidiary manager obtained the management focus he was missing.

As the role of the R&D subsidiary was clarified, and the R&D employees started to carry out tasks they had been assigned, they started to benefit more from the training they received.

Most of the work carried out by the R&D subsidiary so far has gone into one particular project, which initially was targeted at the local market. However, the design, which was created and decided in the R&D homebase, seems somewhat unfit for the high-cost sensitivity of the local market, and the project has been redirected to target other markets, even though this was not initially the plan.

Gradually, more and more decisions are made in the Chinese R&D subsidiary. Within packaging validation, the engineers in the R&D subsidiary are free to take their own decisions. When they validate a package, they no longer need to get their validation validated by the R&D homebase. However, concerning mechanical engineering in relation to mechanical design, the R&D homebase is still largely in power.

Smaller projects have been more successful in the R&D subsidiary so far. One such project was carried out with a local university and resulted in a quality validation rig. The developed type of rig is now to be utilized worldwide in the company, thereby reducing costs related to these quality validations.

In 2011, the R&D subsidiary was appointed the responsibility for an old product system. It is thereby the responsibility of the R&D subsidiary to improve and update this product system. Increasingly, project management will be carried out more and more within the Chinese R&D subsidiary itself, rather than from Scandinavia. However, all projects are still initiated in Scandinavia.

9.4.4 Mechanic Tech

The company is active within the automation equipment industry and has established an R&D subsidiary in China seven years ago. The establishment of the R&D subsidiary is part of the company's initiatives to increase its global footprint, thereby improving sourcing opportunities globally; however, the ability to adapt products locally and respond fast to local demands in the rapidly growing local market are also important reasons behind the R&D subsidiary establishment. To a lesser extent, access to local competence was a motivating factor behind the R&D subsidiary establishment.

9.4.4.1 Subsidiary Autonomy

Core technology in the company is developed in the Scandinavian part of the R&D organization.

The role of the R&D subsidiary was not clear from the beginning. Initially, the engineers of the R&D subsidiary were very eager to develop ideas, and they were given the autonomy to do so. However, most of these ideas were not very useful and were discontinued. The main problems with these ideas were typically that the ideas were nothing new, it had already been tried out before, or it would not really make a difference in the marketplace. In the beginning, the contribution of the Chinese R&D subsidiary constituted primarily support of local production and local sourcing.

A few years ago, the development of a small robot for electronics industries was initiated in the R&D subsidiary. It is a global product, although it is expected to sell primarily in Asia, since that is where the majority of electronic manufacturing takes place. Later, hardware development was also initiated in the R&D subsidiary in China in order to respond to primarily Asian needs and the local sourcing opportunities. The product may be sold elsewhere, but the focus is on Asia.

Gradually, the R&D employees in the Chinese R&D subsidiary become more knowledgeable concerning automation equipment as well as the internal processes of the company. Compared with earlier, they now develop fewer, but better ideas. The Chinese R&D subsidiary is expected to increasingly take part in more and more advanced R&D activities. However, in the near future, this is likely to be still within different types of application of the technology of the company rather than dealing with new core technology.

9.5 Analysis

A common theme between the cases was the difficulty of the newly established R&D subsidiaries to define roles and tasks vis-à-vis the rest of the R&D network. Setting the strategic mandate and specifying task interdependencies was a key trigger for progress with knowledge transfer both for primary, but especially for reverse knowledge transfer. Within Med Tech, Wind Tech and Pack Tech, the newly established R&D subsidiaries initially found their role to be rather unclear. Employees within the newly established R&D subsidiary of Wind Tech in India also found their tasks not to be sufficiently specified. Their Scandinavian engineering colleagues initially felt the Indian engineers carried out calculations somewhat disregarding the context in which the calculation should be utilized. This may relate to a lower level of industry-specific knowledge, that is, wind turbines within the R&D subsidiary in India. For the engineers in the Indian subsidiary, it proved to be more difficult to contextualize the calculations they do, because they lack industry-specific knowledge. The necessary primary knowledge transfer needed in order to mitigate such problems can be inhibited by a lack of clarity in relation to the role of

newly established R&D subsidiaries in emerging markets. Not knowing your role makes it difficult to focus the absorption of knowledge and activities undertaken in a newly established R&D subsidiary. For example, within Pack Tech, the employees in the newly established R&D subsidiary did not know how to make use of all the training they received, before they knew their mandate, and which projects they should participate in. In this sense, the clarification of the role of the R&D subsidiary improves primary knowledge transfer.

Mechanic Tech experienced that the Chinese engineers came up with ideas, which had already been developed previously in the company, but although this at first was perceived as wasted efforts by the HQ, it met local market demands calling for cheaper and simpler technology. Med Tech experienced that employees in the Chinese R&D subsidiary reinvented, for no reason other than what seemed to be ignorance of the existing well-established knowledge and processes within the company. However, it clearly drove local knowledge of the underlying principles of operations aspired in the company, which facilitated a search ability allowing future identification and absorption of corporate best practice. The employees in the Chinese R&D subsidiary have learned to look and ask more carefully in the R&D homebase whether something is in place, before they go ahead and redo it themselves.

9.5.1 Subsidiary Autonomy

A key enabler of knowledge transfer within the case companies was a clear specification of tasks and roles in the newly established R&D subsidiaries, leaving little autonomy for them initially. If a newly established R&D subsidiary has little autonomy, it is likely to depend on the R&D homebase when it carries out its activities. This may create a propensity to build on the existing knowledge base within the company, rather than developing something entirely new. The more autonomy a R&D subsidiary gets, the more likely it will develop knowledge, which is new to the company, for example, by utilizing the resources differently from how they are used in the R&D homebase and/or by taking advantage of its location, which evidently is different from the location of the R&D homebase. At the same time, the risk may increase that the R&D subsidiary "reinvents the wheel" and develops knowledge which has already been developed in the company, as seen within, for example, Med Tech and Mechanic Tech. This risk is likely to be higher if autonomy is granted, to newly established R&D subsidiaries in emerging markets, before much primary knowledge transfer has successfully taken place. However, if a R&D subsidiary never increases its level of autonomy, it may hamper its development at later stages. For example, Wind Tech experiences how clear specifications of the tasks in the R&D subsidiary produce few opportunities in the R&D subsidiary to train the ability to take on more challenging projects. This may indicate that more autonomy is needed at R&D subsidiary level, if a subsidiary is to make more advanced contributions in terms of reverse knowledge transfer.

9.5.1.1 Local Adaptation

One can speculate whether it would have been beneficial for Pack Tech to give more autonomy to the Chinese R&D subsidiary in relation to the big project, which the R&D subsidiary plays a big part in. The local Chinese target market for the project initially would suggest this to be relevant. In any case, the designers in Scandinavia do not seem to learn as much from the project as they could. A reason behind this is that the local Chinese engineers, lacking knowledge about why the design is as it is, find it difficult to report back to the headquarters concerning the results they get when validating the concepts developed in Scandinavia. This can be seen as an example of poor primary knowledge transfer breeding causal ambiguity (Szulanski 1996) as well as poor reverse knowledge transfer (Buckley et al. 2003). However, we may also imply that local autonomy is relevant for the development of local products. Possibly local engineers would have been better able to grasp the local demands (for low-cost solutions). Hence, when local product development is needed for the local market, newly established R&D subsidiaries may need to obtain more autonomy sooner than otherwise. In this case, the subsidiary was probably not ready to lead the project from the beginning. Smaller projects are easier for newly established R&D subsidiaries to run successfully. One example of this is Pack Tech, which runs projects with local universities. One of these projects results in cost reductions in package quality validation processes in the company across the globe. However, future successes of this kind may be hampered a bit by the fact that the R&D subsidiary always has to apply for budget, for these types of collaborations, in the R&D homebase. This may be a better example of situations where R&D subsidiary autonomy should not be granted too sparingly.

Increases in roles and responsibilities may not correspond with higher autonomy. The need for coordination and alignment with other sites and stakeholders may increase as a function of the role sometimes faster than the level of autonomy. As resources increasingly have to be spent on coordination and alignment with other sites, the level of autonomy may decrease. For example, for R&D subsidiaries that, as they grow increasingly take on projects, focus above and beyond local market needs, this is likely to be the case.

If an R&D subsidiary is unable to translate its autonomy into knowledge creation that is aligned with the rest of the company, it may turn out to be ultimately devastating for the R&D subsidiary. This is illustrated in the case of Med Tech, which shut down a newly established R&D subsidiary in the US, for such reasons. Local R&D subsidiary managers may over time try to negotiate and act in order to increase the autonomy of the R&D subsidiaries they manage. However, early on, they may be better off without too much autonomy too soon.

Apart from the implications of role and mandate of an R&D subsidiary, specification practices may also be worth mentioning in this context. In practical terms, the way in which a R&D homebase specifies the work of a newly established R&D subsidiary has implications for the autonomy level of the subsidiary. However, specifications alone do not determine how much autonomy is in place. It is possible

to imagine a situation where the specification level is high; however, autonomy, that is, the liberty to solve the tasks as one wishes to do so could also at the same time be high. This situation is probably rare. Of course, sometimes certain kinds of specification may limit the options for solving the task in different ways and thereby also limit autonomy. This may make it necessary to change the way in which specifications are done when a change in autonomy levels is intended.

9.6 Managerial Implications

This study to some extend confirms the notion that successful primary knowledge transfer facilitates successful reverse knowledge transfer. However, the study supports an extended understanding of primary knowledge transfer where success is determined not just by the ability to replicate homebase knowledge, but rather that efforts should be made into building an understanding of the underlying principles of operations. With this extension, the primary transfer process facilitates a subsequent uptake of knowledge-augmenting activities, which may benefit the corporate stock of knowledge. To a manager, it may not be so helpful in itself to know that primary knowledge transfer success will determine the benefit of reverse knowledge transfer. It may be more valuable for a manager to know how to influence this equation. In line with previous research, it remains clear that causal ambiguity, that is, an inadequate understanding of the reasons for success or failure of a practice, is a key barrier to transfer across locations (Szulanski 1996). Addressing this, it is important to know that the level of autonomy granted to a subsidiary will influence the knowledge flows back and forth between R&D homebase and R&D subsidiary. In order not to jeopardize successful primary knowledge transfer, a gradual increase of subsidiary autonomy is important; however, if a subsidiary does not develop sufficient autonomy over time, it is likely that the potential for beneficial reverse knowledge transfer is not fully reaped. Likewise, granting a high level of autonomy to a subsidiary from the outset will not facilitate an appropriate infrastructure for knowledge flows between subsidiaries. These considerations are particularly important to pay attention to as R&D activities become increasingly internationalized.

9.7 Conclusion

The framework and empirical research suggest that subsidiary autonomy has a negative effect on primary knowledge transfer, and a positive effect on reverse knowledge transfer, as previously illustrated in Fig. 9.1. Newly established R&D subsidiaries in emerging markets need primary knowledge transfer in order to build up local competence and capabilities, but also a deep understanding of the corporate principles of operations, before they can start to challenge and add to the knowledge

stock of the MNC. Gradual increase in R&D subsidiary autonomy is, thereby, beneficial for subsidiary innovation performance during a knowledge build-up phase. Meanwhile, the autonomy of the subsidiary, in the longer term, is more likely to be determined by the strategic mandate of the subsidiary and the type of inter-dependency between the subsidiary and the remaining R&D network. Furthermore, the need for local adaptation of products is important to pay attention to when deciding levels of R&D subsidiary autonomy, as such local needs may trigger a higher need for R&D subsidiary autonomy than otherwise. In other words, we find the well-described trade-off between local responsiveness and global efficiency, but also find that this trade-off may be mediated by carefully designing and orchestrating knowledge transfer infrastructures and aligning it with structural autonomy.

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Part III
Challenges and Opportunities in Offshoring Research and Development

Chapter 10
The Challenge of R&D Offshoring: Implications for Firm Productivity

María Jesús Nieto and Alicia Rodríguez

Abstract R&D offshoring has been gaining in importance in recent years. Nevertheless, there is as yet a very limited understanding of its implications for firms. This chapter analyzes the potential benefits the offshoring of R&D may have on productivity. We distinguish between two governance modes—captive offshoring and offshore outsourcing, and we analyze their direct and indirect effects through innovation. The empirical analysis is based on an extensive sample of Spanish firms in the manufacturing and services sectors covering the 2004–2007 period. Our results enable us to conclude that offshore outsourcing has a positive impact—both directly and indirectly—on productivity. In turn, captive offshoring has a positive impact on productivity, which is observed insofar as the firm innovates. This research reveals the importance not only of R&D offshoring strategies but also of the choice of one or other governance mode according to a firm's specific goals.

Keywords Offshoring · R&D · Innovation · Captive offshoring · Offshore outsourcing · Productivity

10.1 Introduction

In recent years, offshoring has widened its scope and now also includes knowledge-intensive value-added activities (Lewin et al. 2009). Given that R&D offshoring is becoming ever more commonplace (Contractor et al. 2010a), it is

M. J. Nieto (✉) · A. Rodríguez
Universidad Carlos III de Madrid, Madrid, 126, 28903 Getafe (Madrid), Spain
e-mail: mnieto@emp.uc3m.es

A. Rodríguez
e-mail: alicia.rodriguez@uc3m.es

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essential for firms to be aware of its implications. Despite its growing importance, research in this field remains extremely limited. Indeed, as far as we know, the bulk of today's scholarly contributions focus on the motives for R&D offshoring (Ambos and Ambos 2011) and the choice of location (Jensen and Pedersen 2011; Demirbag and Glaister 2010). Research on the consequences of R&D offshoring, however, remains scarce.

The offshoring of R&D could be beneficial in terms of productivity, as a result of the structural and innovation effects forthcoming from the restructuring of the value chain, learning externalities and technological and knowledge diversity (Amiti and Wei 2009; Tang and Livramento 2010). The potential benefits of obtaining inputs overseas and forging international linkages impel us to discuss the relationship between R&D offshoring and productivity. In particular, we firstly consider the direct relationship between R&D offshoring and productivity, and secondly, we explore a possible indirect effect by analyzing the part played by innovation in that relationship. To this end, we define R&D offshoring as the sourcing of R&D across national borders through activities that are both internal and external to the firm for the purpose of serving the home country or global market. In addition, we identify two governance models: through affiliate firms abroad (captive offshoring) or through arm's length relationships with independent foreign suppliers (offshore outsourcing), and we analyze the potential direct and indirect impact these two modes of offshoring have on firm productivity. This work allows us to cast some light on the potential benefits of developing strategies for offshore knowledge-intensive business services (KIBs). On a theoretical and empirical level, it describes and presents evidence on a little-researched phenomenon such as R&D offshoring, and particularly their effects on productivity. In theoretical terms, we identify and analyze two governance models of offshoring (captive offshoring and offshore outsourcing), as well as discussing their potential implications for firm productivity. The study also considers the direct and indirect effects of R&D offshoring on firm productivity through innovation. In empirical terms, the use of a wide data panel allows performing a rigorous quantitative analysis and providing widely applicable results on a research topic in which the evidence is almost anecdotal. The availability of data for different years allows us to include lagged effects of offshoring on productivity and thereby analyze causality. Moreover, we study small, medium and large firms from very different manufacturing and services sectors.

To the best of our knowledge, the paper by Tang and Livramento (2010) is the only one published that examines R&D offshoring and productivity. These authors analyze the possible impact on the productivity of Canadian manufacturing firms when they opt for the offshore outsourcing of their R&D activities. Although their study finds no evidence of a significant relationship, the authors point out that the work is only able to analyze contemporary correlations as it is based on one-time cross-sectional data. In contrast, the information contained in our database enables us to examine the two types of offshoring, introduce lagged effects and produce results that are generalizable to highly different sectors.

The chapter is organized as follows. Firstly, a theoretical analysis is conducted of the direct and indirect relationships between R&D offshoring and firm productivity, and the research hypotheses are formulated. Secondly, the data, variables and methodology are presented. There follows the disclosure of the results of the empirical analysis. The chapter ends by presenting the discussion and conclusions, limitations and future lines of research.

10.2 R&D Offshoring and Firm Productivity

10.2.1 R&D Offshoring and Productivity: A Direct Effect

Offshoring enables firms to make the most of location-specific, disintegration-related and externalization advantages (Kedia and Mukherjee 2009). These advantages may be extremely beneficial for business productivity. There are currently a growing number of firms that pursue strategies of this nature that involve activities of greater value added such as R&D (Ambos and Ambos 2011; Contractor et al. 2010a). R&D offshoring may be implemented by firms in order to achieve numerous strategic goals (Jensen and Pedersen 2011). Productivity may be one of the goals pursued by the firm.

There are localization advantages because the firm may furnish itself with a wide diversity of knowledge available in geographically dispersed settings. Each setting provides unique knowledge as a result of the interaction between firms in that location (Almeida and Kogut 1999). Technological diversity enables a firm to acquire new expertise and relate it to what it already possesses, thereby permitting it to learn and improve its products and/or processes (Lahiri 2010). Furthermore, a firm engaging in offshoring has access to internationally traded inputs, which may be available with a higher quality than those available domestically (Görg et al. 2008). Accordingly, access to the knowledge and technologies located abroad may provide a firm with better quality knowledge that can pave the way for improved efficiency and productivity. In sum, the incorporation of inputs and expertise imported from abroad may improve productivity through the effects of learning, variety and quality (Amiti and Konings 2007).

The advantages associated with disintegration are related to the improvements brought about by the design and organization of the value chain. Kedia and Mukherjee (2009) single out three distinct sets of advantages that may be attained thanks to the disintegration of the value chain: increased focus on core capabilities and the reallocation of other resources; and modularity-related advantages. In the case of the disintegration implied by R&D offshoring, the cost-related advantages are less important than the other two sets of advantages. It may therefore be that the main benefits stem from the concentration on core activities, grouping certain functions together, and from an increasing modularity form. R&D activities may be core operations for the firm, but it may need to group these functions into

certain locations to be more efficient. Firms can redirect their limited but valuable resources (e.g., human resources) to core areas in different locations, where they can generate value for their customers. On the other hand, a disintegrated, leaner and more modular organizational form allows increased flexibility and a speedier response to changing market needs.

Finally, and assuming the markets perform well for the function to be outsourced, the firm may achieve externalization advantages. In terms of improving productivity, these advantages are associated with both the specialization and scale economies the supplier may have and the organizational learning-related benefits provided by dealings with external providers (Tang and Livramento 2010). R&D activities often require highly specialized know-how and assets and involve major investments. International R&D providers may possess the minimum size required and the innovative talent, which the offshoring firm itself may not have. Offshoring firms benefit from their providers' knowledge, high-end skills sets, global scale and collective domain expertise (Kedia and Mukherjee 2009). Moreover, the benefits arising from offshoring partnerships may be of special significance in the case of R&D activities. The knowledge and experience accumulated by international providers may be conveyed to the offshoring firm, thereby providing it with a potential source of competitive advantage (Kedia and Lahiri 2007). It should be noted, however, that outsourcing activities of such importance that are close to the core competence, as R&D activities, is not exempt from risk. Issues of information leakage and difficulties for specifying contracts and verifying their compliance incur additional costs associated with outsourcing R&D overseas (Ellram et al. 2008). Nevertheless, once an offshoring firm is aware of the risks involved in possible opportunistic behavior by suppliers and has taken suitable measures, it may benefit from the competitive advantage arising from the offshoring of R&D to providers abroad.

In light of the aforementioned advantages, the firm may deem it convenient to offshore R&D in order to boost its productivity. Nevertheless, the firm that decides to engage in offshoring can either embark on offshoring internally by setting up their own centers abroad, or externally by outsourcing activities to independent foreign providers, with this being a very important strategic choice (Kedia and Mukherjee 2009).

The choice between the modes of governance—captive or outsourcing—is affected by, among others, the characteristics of both the operations undertaken abroad and the firm itself (Peeters et al. 2010), and especially by the strategic goal pursued (Metters 2008). If the goal the firm pursues through R&D offshoring is to make gains in terms of productivity, the firm should consider the advantages inherent to each mode of governance in offshoring. This means that of the aforementioned advantages, location, disintegration and externalization can be associated with offshore R&D outsourcing, whereas the company that decides to engage in captive offshoring R&D can benefit only from those of location and disintegration. Therefore, we expect that both governance modes of offshoring provide advantages that deliver productivity gains. In view of all the above, we formulate the first hypothesis as follows:

Hypothesis 1: Both modes of governance of R&D offshoring have a positive impact on firm productivity.

10.2.2 R&D Offshoring, Innovation and Productivity: An Indirect Effect

When analyzing the effects R&D offshoring has on productivity, some scholars suggest that productivity may be affected by the generation of a possible innovation effect (Tang and Livramento 2010). This leads us to consider the existence of two links: (1) offshoring of R&D and innovation and (2) innovation and productivity.

Regarding the first link, the literature indicates that the offshoring of R&D enables firms to obtain inputs from abroad that are of significance to innovation (Couto et al. 2007). Accordingly, those firms that pursue strategies for R&D offshoring have access to key inputs, such as new and diverse knowledge and technology (Maskell et al. 2007) and highly skilled personnel (Lewin et al. 2009), which may contribute to the development of innovations. The results of the research by Nieto and Rodríguez (2011) reveal a positive relationship between R&D offshoring and innovation performance. By differentiating between the two modes of governance of R&D offshoring—captive and outsourcing—they contend that captive offshoring R&D has a greater impact on innovation results than offshore R&D outsourcing. Therefore, if a firm has the necessary capabilities and resources for developing captive centers, it will record better innovation outcomes. Nevertheless, for those firms that are not in a position to implement captive modes, offshoring outsourcing is an attractive alternative, provided they preempt the risks that may arise and take the necessary measures to minimize them.

Regarding the second link, previous research finds evidence to confirm that both manufacturing and services firms may obtain gains in terms of productivity forthcoming from the adoption of new processes and products (Hall et al. 2009; Musolesi and Huiban 2010). The adoption of new processes might lead to enhanced efficiency that allows increasing production and, ultimately, productivity (Parisi et al. 2006). Furthermore, the incorporation of new products enables firms to adapt and reinvent themselves in order to continue being competitive (Brown and Eisenhardt 1995). These possible positive relationships between offshoring and innovation (with a greater impact of captive offshoring) together with the relationship between innovation outputs and productivity lead us to consider the following hypothesis:

Hypothesis 2: R&D offshoring has a positive and indirect impact on firm productivity, with captive offshoring R&D having a greater impact than offshore R&D outsourcing.

Figure 10.1 provides an overview of the relationships considered in the research hypotheses.

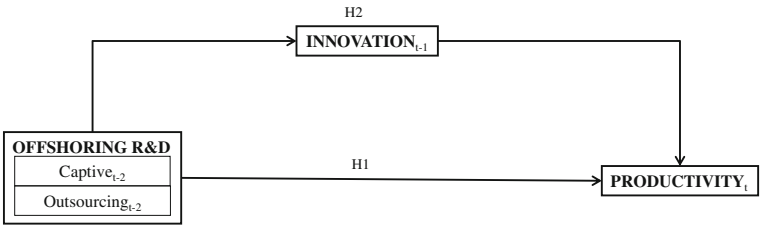

Fig. 10.1 Offshoring R&D and productivity

10.3 Empirical Analysis

10.3.1 Sample

The empirical analysis conducted here uses the technological innovation panel (TIP). This panel is compiled by Spain's National Statistics Institute, Science and Technology Foundation, and Foundation for Technical Innovation. The panel provides information on different aspects of a firm's innovation and internationalization strategies, ownership structures and other general and economic information. The TIP collects data on firms from all sectors of the Statistical Classification of Economic Activities in the European Community (NACE) for different years. The empirical analysis uses an unbalanced panel of around 12,000 Spanish manufacturing and services firms for the period from 2004 to 2007, compiled on a yearly basis.

10.3.2 Variables

The *dependent variable* is *Productivity*, which is measured as the logarithm of sales per employee (Bloom and Van Reenen 2010; Hall et al. 2009; Konrad and Mangel 2000).

The *independent variables* are described as follows: *Captive offshoring R&D* is a dichotomous variable that takes the value 1 when the firm acquires R&D services from an affiliate; and *Offshore R&D outsourcing* is a dichotomous variable that takes the value 1 when the firm buys R&D services from other firms, public administrations, universities or organizations abroad. Both independent variables are included in the analyses with a two-period lag. Finally, we include *Innovation,* which is a dichotomous variable that takes the value 1 whether it develops product or process innovation. It is included in the analyses with a one-period lag, being incorporated here in one model as the dependent variable and in another one as an independent variable to analyze its mediating role by studying the indirect relationship offshoring has on productivity.

Control variables. Following on from previous work, we include variables to capture other firm-specific characteristics that may be related to productivity (Guthrie 2001; Konrad and Mangel 2000; Görg et al. 2008). First, we control for size, using the logarithm of the number of employees as a proxy for firm size (*Size*). Second, we control for whether the company is a new firm using a dichotomous variable that takes the value 1 if the firm has been incorporated in the last 2 years (*New firm*). Third, we control for international activity, using a dichotomous variable that indicates the international presence of the firm. This variable takes the value 1 if the firm has sold its products or services abroad (*International activity*). Fourth, we control for foreign ownership with a dichotomous variable that takes the value 1 if at least 50 % of the firm's capital is in non-domestic hands (*Foreign ownership*). Fifth, we control for industry. Our database contains 55 sector classifications that are grouped in accordance with the Spanish Stock Exchange's January 2005 sector classification (with several modifications, such as identifying certain services as knowledge intensive). The activities are grouped into five categories: *Oil and energy*; *Basic materials*, *industry and construction*; *Consumer goods*; *Consumer services and KIBs*. The exclusion of one of the sectors from the models is necessary to avoid problems of perfect multicollinearity. Thus, the models do not include *Consumer goods*, which is used as a baseline category. Lastly, we control for year with bivariate indicators for each year of analysis.

10.3.3 Methodology

With a view to verifying hypothesis 1, and given that *Productivity* is a continuous variable, we estimate a regression model that analyzes the direct impact of the governance modes of R&D offshoring—captive and outsourcing—on productivity (Model 1). More formally, the empirical model presents the following econometric specification:

$$\begin{aligned}(\text{Productivity})_{it-1} = {} & \alpha_p + \beta_1(\text{Captive offshoring R\&D})_{it-2} + \beta_2(\text{Offshore R\&D outsourcing})_{it-2} \\ & + \beta_3(\text{Size})_{it} + \beta_4(\text{New firm})_{it} + \beta_5(\text{International Activity})_{it} + \beta_6(\text{Foreign Ownership})_{it} \\ & + \beta_7\left(\sum \text{Sector}_n\right)_{it} + \beta_8\left(\sum \text{Year}_t\right)_{it} + \varepsilon_i\end{aligned}$$

where α is the constant, β is the vector of coefficients and ε is the error term.

In order to verify hypothesis 2, which analyzes the indirect effect of both modes of R&D offshoring on productivity, through innovation, we need to test the mediating role of innovation in that relationship. To analyze the mediating role of innovation, we have followed the methodology described by Baron and Kenny (1986). This methodology has been used to analyze the presence of mediator variables in many studies (Boxall et al. 2011; Dou et al. 2010; Reuber and Fischer 1997, among many others).

According to this methodology, there are four steps to determine whether a variable mediates the relationship between an independent variable and a dependent variable:

1. The first step is to analyze the direct relationship (already described in hypothesis 1); that is, confirm there is a significant relationship between the independent variables (*Captive offshoring* and *Offshore outsourcing*) and the dependent variable (*Productivity*)—see Fig. 10.1.
2. The second step is to show that the independent variables (*Captive offshoring* and *Offshore outsourcing*) are related to the mediator variable (*Innovation*).
3. The third step is to show that the mediator variable (*Innovation*) is related to the dependent variable (*Productivity*).
4. The fourth and final step is to check that correlation between the independent variables (*Captive offshoring* and *Offshore outsourcing*) and the dependent variable (*Productivity*) is significantly reduced when the mediator variable (*Innovation*) is included in the model.

If the four steps are fulfilled, we can affirm there is an indirect relationship between the governance modes of offshoring and productivity through innovation. In this case, empirical support would be provided for hypothesis 2. "Perfect mediation" holds if the independent variable has no effect when the mediator is controlled, which would indicate that there is only an indirect relationship between the two variables.

To test for mediation, Baron and Kenny (1986) recommend estimating three regression equations:

1. Regression of the independent variable (X) on the dependent variable (Y); model 1.
2. Regression of the independent variable (X) on the mediator variable (M); model 2.
3. Regression including the independent variable (X) and the mediator (M) on the dependent variable (Y); model 3.

Depending on the dependent variable, two types of econometric models were used as follows: (1) the regression model where the dependent variable is *Productivity*—model 1 (see the specification model described earlier for hypothesis 1) and model 3 (the same specification as model 1 including *Innovation* as independent variable); and (2) the probit model where the dependent variable is *Innovation*—model 2. Formally, this model has the following econometric specification:

$$\begin{aligned}\text{Prob (Innovation)}_{it-1} = {} & \alpha_p + \beta_1(\text{Captive offshoring R\&D})_{it-2} + \beta_2(\text{Offshore R\&D outsourcing})_{it-2} \\ & \beta_3(\text{Size})_{it} + \beta_4(\text{New firm})_{it} + \beta_5(\text{International Activity})_{it} + \beta_6(\text{Foreign Ownership})_{it} \\ & \beta_7\left(\sum \text{Sector}_n\right)_{it} + \beta_8\left(\sum \text{Year}_t\right)_{it} + \varepsilon_i\end{aligned}$$

where α is the constant, β is the vector of coefficients and ε is the error term.

All our models were also analyzed for potential multicollinearity problems by conducting an analysis of the variance inflation factor (VIF). Individual VIF values higher than ten, combined with average VIF values higher than six, indicate a multicollinearity problem (Neter et al. 1989). The values set out in Table 10.1 show there are no problems of multicollinearity in any of the models. All the models include the remaining firm-specific controls and sector and yearly dummies.

10.4 Results

10.4.1 Descriptive Statistics

Figure 10.2 provides a graphic description of the proportion of firms in the sample that undertake captive offshoring and offshore outsourcing R&D, depending on their size and on their business sector. Interesting differences are related to governance models of offshoring and the size of firms. Captive offshoring R&D is preferred mainly by large firms, while offshore R&D outsourcing is chosen by firms regardless of size. This may be because offshore R&D outsourcing is a favored option when resources to invest in captive operations are not available or when dealing with smaller-scale projects. Regarding the sectorial distribution, the highest proportions of firms pursuing offshoring activities are to be found in the sectors of basic materials, industry and construction and consumer goods.

10.4.2 Direct Relationship Between R&D Offshoring and Productivity

The first column in Table 10.2 gathers the results for model 1, which tests hypothesis 1. The coefficients of the variables *Captive offshoring R&D* and *Offshore R&D outsourcing* are positive and significant, with the coefficient for offshore outsourcing being higher. These findings provide empirical support for hypothesis 1. Regarding the control variables, the size variable has a negative coefficient, but it is not significant. Being a newly incorporated firm is negatively and significantly related to productivity. For their part, international activity and foreign ownership have a positive and significant impact on productivity. Finally, the coefficients related to the sectorial categories *Oil and energy* and *Basic materials* are positive and significant, suggesting that belonging to these sectors is associated with greater productivity than when pertaining to *Consumer goods* (which is the category excluded from the analyses). The opposite happens in the case of firms belonging to the sectors of *Consumer services* and *KIBs*, whose coefficients are negative and significant.

Table 10.1 Descriptive statistics, correlations and collinearity diagnostics of the independent and control variables

	Mean	St. Dev.	1	2	3	4	5	6	7	VIF[1]	VIF[2]
1. Captive offshoring $R\&D_{t-2}$	0.01	0.10	1.000							1.06	1.06
2. Offshore R&D outsourcing$_{t-2}$	0.03	0.16	0.096***	1.000						1.02	1.02
3. Innovation$_{t-1}$	0.59	0.49	0.058***	0.086***	1.000					−1.08	1.08
4. Size$_t$	4.19	1.67	0.088***	0.0049***	−0.022***	1.000					1.09
5. New firm$_t$	0.02	0.13	−0.009	−0.008	−0.039***	−0.151***	1.000			1.01	1.01
6. International activity$_t$	0.05	0.50	0.076***	0.094***	0.270***	0.081***	−0.077***	1.000		1.04	1.10
7. Foreign ownership$_t$	0.09	0.29	0.203***	0.031***	0.039***	0.257***	−0.033***	0.201***	1.000	1.13	1.13
							Media VIF			1.06	1.07

***$p < 0.01$, **$p < 0.05$, *$p < 0.10$. $N = 45{,}205$

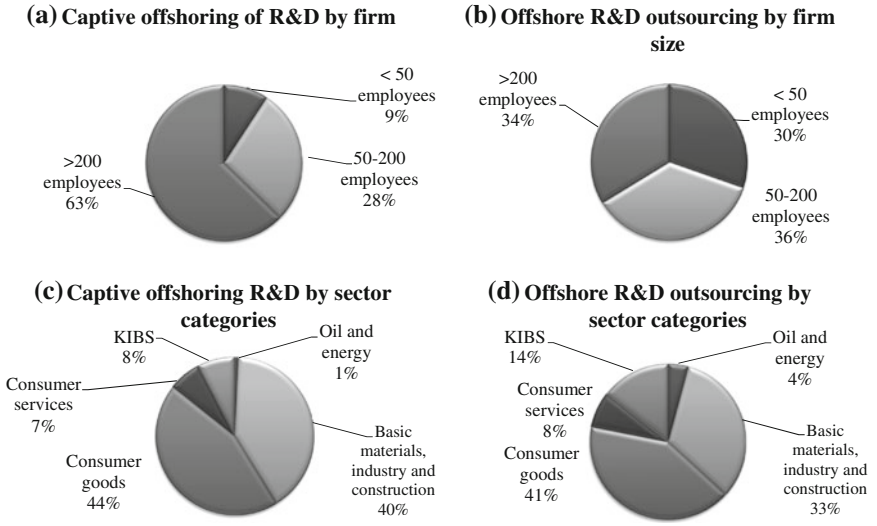

Fig. 10.2 Captive offshoring R&D and offshore R&D outsourcing by size and sector categories

10.4.3 Indirect Relationship Between R&D Offshoring and Productivity

To test hypothesis 2, which postulates the positive and indirect effect of R&D offshoring on productivity, through innovation, it is necessary to analyze the mediating role of *Innovation* in this relationship. This requires verifying that the four conditions mentioned above are met. Condition 1 has already been satisfied, as it has been shown there is a positive and direct effect of captive offshoring R&D and offshore R&D outsourcing on productivity (model 1). Condition 2 involves corroborating the relationship between both modes of R&D offshoring and *Innovation*. To analyze this relationship, we consider the probit model, whose results are presented in the second column of Table 10.2—model 2. The estimated coefficients for both modes of offshoring are positive and significant, indicating that the explanatory variables (*Captive offshoring* and *Offshore outsourcing*) are related to the mediator (*Innovation*), thus satisfying Condition 2. The next step is to include the mediator variable (*Innovation*) in the original regression, together with the independent variables. It can be seen (in column 3 of Table 10.2—model 3) that the coefficient of the mediator variable is positive and significant for the relationship with *Productivity*, and so Condition 3 is also satisfied. Finally, Condition 4 is satisfied, given that the relationship between the independent variables and the dependent variable *Productivity* is significantly reduced when *Innovation* is included in the model. In the case of offshore R&D outsourcing, the mediating relationship is partial, which indicates that the effect of these activities on the firm's productivity is both direct and indirect, through innovation. The significance of *Captive offshoring R&D* is reduced to zero in model 3, indicating perfect

Table 10.2 Offshoring of R&D and firm productivity

	Model 1 productivity_t	Model 2 innovation_{t-1}	Model 3 productivity_t
Captive offshoring of $\text{R\&D}_{t-2}$	0.129** (2.18)	0.913*** (7.11)	0.091 (1.54)
Offshore R&D outsourcing_{t-2}	0.215*** (5.83)	0.679*** (9.71)	0.184*** (4.99)
Innovation_{t-1}	–	–	0.203*** (14.46)
Size_t	−0.003 (−0.86)	−0.043*** (−7.86)	−0.001 (−0.03)
New firm_t	−0.511*** (−6.44)	0.921*** (3.40)	−0.559*** (−7.07)
$\text{International activity}_t$	0.474*** (34.24)	0.540*** (27.97)	0.437*** (31.13)
$\text{Foreign ownership}_t$	0.470*** (21.60)	−0.129*** (−4.17)	0.478*** (22.04)
Oil and energy	0.579*** (10.24)	0.007 (0.09)	0.577*** (10.25)
Basic materials, industry and construction	0.087*** (5.28)	−0.003 (−0.15)	0.088*** (5.35)
Consumer services	0.031* (1.68)	−0.441*** (−16.41)	0.065*** (3.35)
Knowledge-intensive services	−0.816*** (−42.88)	−0.128*** (−4.73)	−0.806*** (−42.56)
Constant	11.549*** (57.80)	0.517*** (16.29)	11.407*** (46.46)
Test of goodness of fit	621.66***	2075.41***	592.51***
R^2	0.227		0.234
Log. Likelihood	–	−13,322.04	–

***$p < 0.01$, **$p < 0.05$, *$p < 0.10$

mediation; that is, the positive effect of captive offshoring on productivity is an indirect effect through innovation (perfect mediation holds). It can thus be contended that captive offshoring R&D makes a positive contribution to firm productivity insofar as the firm innovates.

These results, therefore, offer empirical support for hypothesis 2, given that an indirect relationship has been confirmed between R&D offshoring and firm productivity.

10.5 Discussion and Conclusions

In recent years, and on an ever expanding basis, firms have turned to offshoring no longer for reasons of cost-cutting but in search of creativity and innovation (Contractor et al. 2010b). Offshoring high-value-added activities such as R&D is increasingly gaining in importance (Ambos and Ambos 2011; Contractor et al. 2010a). In spite of the significance of these strategies, the analysis of their implications in terms of business productivity has not received the attention it deserves in scholarly literature. This paper takes a step forward in this direction by analyzing the implications the governance modes of R&D offshoring have for productivity. First, an analysis is made of the potential direct impact on productivity of captive offshoring R&D and offshore R&D outsourcing. Second, an investigation is conducted into the indirect effect that, through innovation, these two modes of offshoring governance may have on productivity.

Regarding the first relationship, the results forthcoming enable us to conclude that offshoring activities have a positive and direct impact on productivity. This positive relationship is consistent with that found in other research conducted for material and services offshoring (Amiti and Wei 2009; Görg et al. 2008). Most previous research focused solely on the analysis of outsourcing modes. This work has gone further, conscious that the development abroad of R&D activities through affiliates or independent third parties has different implications and, therefore, constitutes a highly strategic decision for a firm. Along these lines, the results show us that both modes of governance of offshoring have a positive and direct impact on productivity. It is thus revealed that both captive and outsourcing formulas are relevant for boosting productivity. These results may be explained by different location, disintegration and externationalization advantages associated to each modes of governance of R&D offshoring.

As regards the second relationship, offshoring has a positive and indirect impact on productivity through innovation. In other words, a firm's productivity increases thanks to the improvement in processes or the supply of new products—innovation—which in turn is impacted positively by engaging in the offshoring of R&D activities. This indirect effect is greater in the case of captive offshoring than in that of offshore outsourcing. In line with prior research, the impact captive offshoring has on innovation performance outperforms that of offshore outsourcing (Nieto and Rodríguez 2011). The incorporation of new products and enhanced

processes has a positive bearing on business productivity, as shown by other authors (Hall et al. 2009; Musolesi and Huiban 2010). This greater positive impact on innovation will lead to a better performance in terms of productivity. By analyzing the indirect relationship of offshoring on productivity, it is also found that the mediating effect of innovation is perfect in the case of captive offshoring and partial in the case of offshore outsourcing. The existence of a partial effect means that both the direct and indirect effects of offshore outsourcing on productivity are present. Both when the firm manages to record innovative results and when it does not, offshore outsourcing operations have a positive impact on productivity. As noted earlier, this effect may be due to the various advantages—location, disintegration and externalization—which this mode of offshoring may provide for the company. The perfect mediation effect of captive offshoring indicates that the positive impact on productivity of the offshoring activities undertaken by the firm's own facilities abroad occurs solely insofar as the firm manages to innovate in its processes or products. The advantages related to location-specific resources and the disintegration of firm value chain have potential for improving productivity through innovation.

All things considered, this research reaches interesting conclusions regarding the implications of R&D offshoring for productivity. The identification in the analysis of two modes of governance—captive and outsourcing—enriches the study made by providing further knowledge on the implications for a firm of sourcing R&D overseas. The evidence gathered highlights how important it is for a firm to choose the most suitable mode of governance according to the strategic goals it is pursuing. The empirical results are obtained from an extensive sample of Spanish firms of different sizes belonging to different business sectors (both manufacturing and services). The representativeness of the sample, together with Spain's status—occupying a mid-table position in the technological league of countries—means that the study's findings can be generalizable to different sectors and countries.

This research has certain limitations, which are in part due to the data available. It would therefore be of considerable interest to distinguish between destination countries according to their degree of technological development and analyze whether the impacts on productivity are different depending on that level of development. Another important issue to be considered is the geographic diversity or heterogeneity of the countries in which a firm conducts its R&D operations. In turn, the existence of inter-organizational linkages between R&D units—both when they are the firm's own facilities and when they belong to third parties—increases both the breadth and depth of knowledge in different ways and allows exerting a more reliable control over such activities. The establishment of these linkages may be crucial in terms of the direct and indirect impacts R&D offshoring operations have on productivity. Future research would do well to analyze these and numerous other aspects of the relationship between R&D offshoring and its implications for firms.

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Chapter 11
Industrial R&D Centers in Emerging Markets: Motivations, Barriers, and Success Factors

Anna Dubiel and Holger Ernst

Abstract Due to their strong economic growth as well as increasing local know-how, emerging markets (EMs) have turned into attractive locations for research and development (R&D) activities of Western multinational companies (MNCs) in the last two decades. Especially, full-fledged R&D laboratories focusing on core products of MNCs are mushrooming regardless of industry. On the basis of a recent research study of German and US MNCs, we identify the main motivations and barriers related to establishing R&D sites in EMs as well as demonstrate how these barriers can be overcome in order to reach the aims encapsulated in the internationalization motives. We find that of particular importance for a successful R&D center in EMs are presence of a global R&D strategy, top management support, personality of the R&D site managing director, "ownership" of development tasks, global innovation culture, accurate R&D HR policy, and external as well as internal networking. Finally, we demonstrate that local R&D laboratories increasingly develop products for worldwide markets.

Keywords Emerging markets · Captive R&D center · MNC · Internationalization · Motivations · Barriers · Success factor

A. Dubiel (✉) · H. Ernst
WHU—Otto Beisheim School of Management,
Chair for Technology and Innovation Management,
Burgplatz 2, 56179 Vallendar, Germany
e-mail: anna.dubiel@whu.edu

H. Ernst
e-mail: hernst@whu.edu

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11.1 Introduction

In the last decade, emerging markets (EMs) have gained in importance for Western multinational companies (MNCs) as both attractive sales markets and sources of distinct technological know-how. Although so prominent, the labeling EMs is not explicit. A number of different country groups are called EMs. A very common synonym is "BRIC" (Brazil, Russia, India, and China) (Goldman Sachs 2009). This group has further been extended by the so-called Next-11 economies (Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, South Korea, Turkey, and Vietnam) (Goldman Sachs 2009). Apparently, EMs are far from being a homogenous group of countries in terms of geography, culture, or political systems. Nevertheless, they do have some common characteristics like relatively big and fast-growing domestic markets, a promising human capital, and technological potential as well as basic political stability (Goldman Sachs 2009). Because of this, more and more Western MNCs decide to open local research and development (R&D) facilities. Many of them go beyond outsourcing simple R&D-related back-office operations like IT support, documentation, or testing. A good example is General Electric (GE) that opened a multidisciplinary, full-fledged R&D laboratory in Bangalore as early as in 2000 (Dubiel 2009; Wille 2009). This facility employing about 4,200 researchers and engineers (co)developed such a wide product range like a portable electrocardiogram device, turbines for the new Boeing "Dreamliner," or pedestrian safe car bumpers. Clearly, EMs are changing their image from cost-effective mass production bases to powerhouses in the field of new product development. Albeit all these positive news, there still remain some challenges associated with building R&D sites in EMs. For instance, many companies fear the loss of intellectual property (IP), lack experience with local markets, or have to deal with high local employee turnover rates. Thus, it is always up to the top management to decide whether for a particular MNC, the anticipated benefits will eventually outweigh the associated risks.

Our motivation behind the research project leading to this chapter was providing some evidence on how Western MNCs—both multibillion euro corporations and mid-size businesses—successfully establish captive R&D sites in EMs focusing on the development of innovative products for local and global markets. Our understanding of R&D in this context is very broad ranging from basic research to applied product-oriented development. Based on extensive case analysis in four industries complemented by literature review, we intended to identify the main motivations and barriers related to establishing R&D sites in EMs as well as show how these barriers can be overcome in order to reach the aims encapsulated in the internationalization motives.

The resulting chapter is organized along these contributions preceded by an outline of the general development path of R&D activities in EMs. We conclude with a brief summary of our most important findings for the practice of R&D management in EMs. Although the geographic focus of our research has been on India and China as they attract the lion's share of the Western R&D investment,

most of our observations can be applied to other EMs as well. Thus, in the remainder of the chapter, we will use the term EM with regard to the aforementioned group of countries as a whole.

11.2 R&D Capacities in Emerging Markets

We start with introducing a few basic facts about foreign R&D centers in the two biggest EMs, that is, India and China. Then, we will briefly outline the typical development paths of foreign R&D facilities in EMs.

11.2.1 Some Basic Facts

R&D investment by foreign MNCs in EMs is rapidly increasing. For example, a recent survey result shows that by 2015, about 19 % of Western European and 23 % of North American firms will invest more than a quarter of their R&D budgets in EMs in contrast to 7 and 11 %, respectively, doing it currently (Ernst and Young 2010). With regard to the main beneficiaries China and India, this translates into an impressive amount of local R&D affiliates of foreign MNCs. Estimations with regard to China show that the number of R&D facilities belonging to international companies amounts to 1,200 representing a 9.3 billion euro investment (Moody 2011). Most of them are located in Beijing and Shanghai and are concentrated in technology-intensive fields such as electronic communications, biopharmaceuticals, automobiles, chemicals, and software (Fujitsu Research Institute 2010). US companies are the biggest investor followed by Japan and Europe. Concerning India, different sources reckon from 639 to 871 foreign R&D laboratories[1] in 2010 (Basant and Mani 2012). During 2005–2010,[2] alone foreign FDI in R&D summed up to more than 470 million euro (Basant and Mani 2012). United States is the largest investor followed by Germany and Korea, France, and Japan (TIFAC 2006). In terms of industry, most of these R&D facilities can be identified in high-technology sectors such as telecommunications equipment, IT, pharmaceuticals, and biotech industries (Basant and Mani 2012). The highest density of foreign R&D laboratories can be found in Bangalore and New Delhi (Basant and Mani 2012; TIFAC 2006).

[1] It is not always clear how a foreign R&D laboratory is defined. It seems that a laboratory is counted as foreign on the basis of foreign equity holding in the center, that is, if it exceeds 10 % or more, it is regarded as foreign.

[2] Please note that there are no numbers for 2009 available.

11.2.2 The Evolutionary Perspective

As demonstrated above, the strategic importance of R&D sites in EMs is steadily increasing. However, establishing R&D capacities in such countries is more challenging than opening production or sales subsidiaries with which many firms already have experience. This complexity is first and foremost due to the strategic long-term characteristic of such decisions which cannot be readily revised without high costs. Moreover, the success of an R&D facility is visible only after several years. Also, the already mentioned obstacles like limited IP protection in some host countries pose additional challenges. Thus, a simple transfer of lessons learnt with local production and sales should be carefully deliberated. The main reason is that such subsidiaries have totally different goals like cost reduction in manufacturing or the implementation of local marketing measures.

Most MNCs possess at first, a central R&D department at or near their headquarters (HQ) (left lower quadrant in Fig. 11.1). The extension of the R&D activities can occur along two dimensions.

The first dimension (Y-axis) touches the geographic distribution of R&D activities. On this, in fact, continuous scale, two general categories "central R&D at home" and "decentral R&D abroad" can be identified. The more different overseas R&D locations a firm has and the more independent from HQ they are, the higher its internationalization degree. According to that MNCs like GE, Siemens or SAP with their strong R&D presence in EMs—which will be described

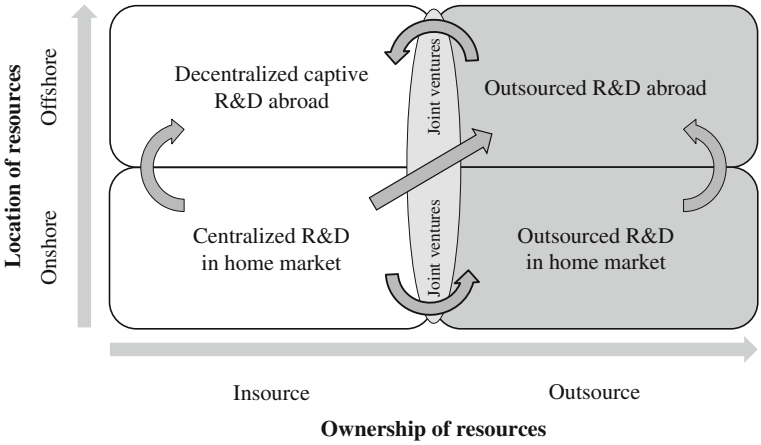


Fig. 11.1 Forms of industrial R&D activities and trend toward decentralized captive R&D abroad (adapted from Eppinger and Chitkara 2006, p. 27). (This figure is reproduced with kind permission of MIT Sloan Management Review/Massachusetts Institute of Technology. All rights reserved. Distributed by Tribune Media Services © September 4, 2012)

in more detail in the following subchapters—exhibit high degrees of R&D internationalization.

The second dimension (X-axis) relates to the question if a given activity—in our case R&D—should be performed within the boundaries of the firm or with the help of third parties. R&D is a very sensitive firm activity directly touching the firm's core competencies. Thus, each company should carefully decide which activities are indispensable for retaining its innovativeness and future competitiveness. We cannot provide a general answer to this question. However, most of the firms we examined in our research project have at least middle term opted for own R&D facilities in EMs (left upper quadrant in Fig. 11.1). These findings are supported by further studies showing a trend toward decentralized, captive R&D laboratories (Boutellier et al. 2008; Eppinger and Chitkara 2006; Ernst and Young 2010). In many cases like GE or SAP, such EMs' R&D sites play an equal role among other worldwide R&D locations. However, there is a long way to go, before a full-fledged R&D center can be established in an EM. On their way, many firms fall back on third parties (both right quadrants in Fig. 11.1) and enter, for instance, joint ventures with local partners like the German agricultural machinery manufacturer CLAAS in India.

Thus, often a captive R&D site in an EM (upper left quadrant in Fig. 11.1) is the most advanced level of a local business engagement. In most cases, Western MNCs start their local activities in EMs with sales offices. They are followed by a gradual establishment of local manufacturing capacities—often due to local governmental regulations. At the latest, at this stage, most MNCs realize that it might be worth to adjust their products to a higher extent to local market needs and start some application development often with external partners (joint ventures or upper right quadrant in Fig. 11.1). These first development activities can be gradually expanded into a captive R&D center, the latter being the main focus of our chapter.

11.3 Research Methodology

In our explorative research, we wanted to uncover the main motivations and barriers behind R&D internationalization into EMs from the perspective of Western MNCs. Moreover, we wanted to study and learn how successful MNCs manage their local R&D, that is, how they overcome the many barriers in order to reach their R&D internationalization aims mirrored by their internationalization motives. We have limited our research to India and China as they are the main beneficiaries of Western R&D-related FDI. Similarly, the United States and Germany are among the leading R&D investors in these countries. We focused on four broad industries, namely machinery, automotive, electronics/IT, and chemistry as they are the backbone of both the US and German economies and very export-oriented. We purposefully selected MNCs of different sizes spanning from

160 million to 124 billion euro revenues (in 2008). Altogether we have studied 14 technology-intensive MNCs and their affiliates[3] and conducted 40 interviews with experienced R&D managers most of whom were personally involved in the establishment of local R&D sites over a longer period of time.

Our research project lasted from 2008 to 2010 and consisted of two parallel research efforts. First, we asked knowledgeable R&D executives from the above-mentioned firms to prepare in-depth case studies of their respective R&D facilities in China and/or India. Each case study was based on specific guidelines to enhance comparison. It described in detail the given R&D site, how it was build up and managed, what role it played in the worldwide R&D network as well as what were the main drivers and barriers behind its establishment. Second, in addition to these case studies, we conducted further semi-structured interviews on the same topics with selected R&D executives—many of them on-site in India. Both the case studies and the interviews were complemented by a wide range of (internal) company materials like presentations and memos. The findings of the case studies and of our interviews were discussed in great detail with the respective company representatives during two workshops held at the WHU—Otto Beisheim School of Management in Vallendar, Germany, in spring 2008 and in autumn 2010. This prevented us from driving erroneous conclusions and interpretations out of the data.

Based on both the company data and a literature review, we identified four motivations and four barriers of Western MNC R&D internationalization into EMs as well as seven key success factors helping to overcome the exiting barriers.

11.4 Motivations and Barriers of R&D Activities in Emerging Markets

In the following, we present the main motivations and barriers of R&D internationalization into EMs from the perspective of Western MNCs (see Fig. 11.2). In the two sub-chapters, we limit ourselves to motivations and barriers internal to the company.

11.4.1 Motivations

There are several reasons why western MNCs start R&D operations in EMs. The most prevailing are proximity to local sales markets, a large pool of skilled

[3] These companies were Bosch, CLAAS, Continental, Dell, Evonik Degussa, GE, MAN Diesel, Nokia Siemens Networks, SAP, Sartorius, SCHOTT, Siemens, SUSPA, and Tyco Electronics. Not all of them have been involved in all parallel research efforts described in this sub-chapter.

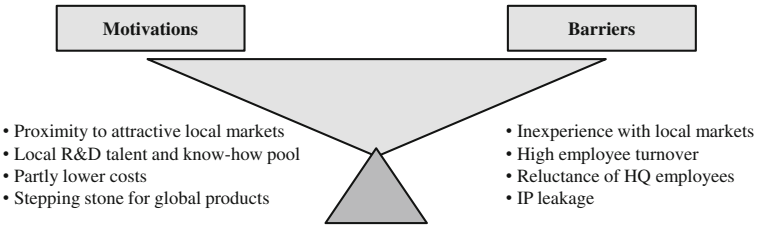
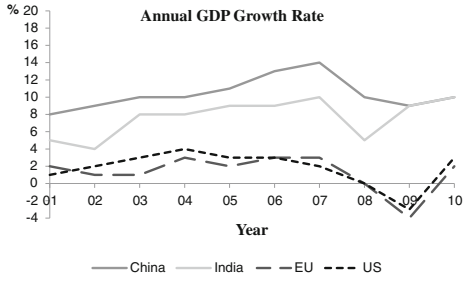


Fig. 11.2 Motivations and barriers of Western MNCs pursuing R&D in EMs. This figure is reproduced with kind permission of Springer-Verlag GmbH © July 27, 2012)

personnel, to some extent lower costs, and the potential to profit from products developed locally also in other markets.

First, local sales markets become increasingly attractive. These developments urge MNCs headquartered in developed countries to respond quickly in order to maintain their competitive positions both in domestic and in international markets. On the country level, many EMs have experienced extraordinary growth of their economies in the last years. For instance, China's average annual GDP increase over the last decade amounts to 10 %, whereas India's is still 7.7 % (see Fig. 11.3). In comparison, the European Union and United States have not surpassed on average the 2 % threshold during this time and even experienced a decline of their economies. Such statistics indicate that many EMs have started to close the gap on more developed countries like Germany or the United States at a fast pace (see Fig. 11.3).

On the individual level apart from the often declining premium market segment traditionally dominated by western MNCs, particularly the fast-growing middle



China and India Move Up USD-demoninated GDP Rankings

	2007	2008	2009	2010	2011*	2012*
1	US	US	US	US	US	US
2	JP	JP	JP	CN	CN	CN
3	CN	CN	CN	JP	JP	JP
4	DE	DE	DE	DE	DE	DE
5	UK	FR	FR	FR	FR	FR
6	FR	UK	UK	UK	UK	UK
7	IT	IT	IT	BR	BR	BR
8	ES	RUS	BR	IT	IT	IT
9	CA	ES	ES	IN	IN	IN
10	BR	BR	IN	CAN	RUS	RUS
11	RUS	CA	CA	RUS	CA	CA
12	IN	IN	RUS	ES	ES	ES

* Forecasts.

Fig. 11.3 Growth of selected EMs in relation to more industrialized countries (*Source* Goldman Sachs 2011, p. 2; World Bank 2011). The right hand part of this figure is reproduced with kind permission of Goldman Sachs AG © August 23, 2012)

market segment deserves special attention (Gadiesh et al. 2007). The World Bank estimates that the global middle class—defined as earners making USD10–20 a day—is likely to grow from 430 million in 2,000 to 1,2 billion in 2030 (Bussolo et al. 2008). These increasingly solvent and technology-savvy new customers ask for tailor-made products that have both a low price and meet their particular needs. Such "good-enough" products—as experience shows—can be best developed on-site by local R&D staff. Firms' central R&D departments located in more developed markets and used to high end, and sometimes even over-engineered products are less successful. In this segment, Western MNCs still have a realistic chance to counter cost-driven local competitors. Moreover, if they refuse entering this segment, they run the risk of being preempted by local rivals in their home markets, too. Local R&D also reduces delivery time—another essential requirement for the presence in dynamic markets. A good example here is Bosch, the leading German automotive parts supplier, who developed components for the low-cost car "Tata Nano" in its Bangalore-based R&D facility.

Second, MNCs can profit from the huge local talent pool of researchers and engineers as local governments increasingly invest in science and technology (S&T) as well as higher education institutions. For instance, China plans to increase its R&D spending from 1.5 % of GDP in 2007 to 2.5 % in 2020 (Deutsche Bank Research 2011), whereas India plans to achieve the target of 21 million students by 2012, compared to 14.8 million in 2007 (UNESCO 2010). Although one has to keep in mind that EMs have started from a relatively low level of S&T development, they gradually make up ground on more developed markets in terms of R&D output-like patents filed or scientific journal publications (World Bank 2011).Without a local R&D laboratory, it would be difficult to attract local top talent and leverage its potential worldwide. Such a human resources (HR) strategy may even help to counteract the stagnating number of graduates in engineering and natural sciences in many of the MNCs' home markets. Additionally, local R&D centers allow direct access to specific local knowledge clusters. A prime example of such a "pocket of innovation" is Bangalore known for its IT expertise. MNCs like GE or Siemens establish their R&D laboratories in this region. For GE, local talent was the main motivation to come to India (Dubiel 2009; Wille 2009), and Siemens explicitly looks for employees with strong "technopreneurial" skills (Monster India 2007).

Third, some MNCs report lower R&D costs, especially lower labor costs, as a driver of local R&D facilities. How far this really holds for a given company should be carefully calculated case by case including a broad range of "hidden" costs like the necessity to spend more time on tasks than R&D teams at home would spend or home-country overhead time for sharing expertise and setting standards. Most of the MNCs we interviewed like, for instance GE, however, underscored that this was not their main long-term reason for a local R&D presence.

Last but not least, pioneering MNCs demonstrate that products primarily developed in EMs for local use can well be exported to other EMs or even—after some adjustments—to more developed markets. Such a "reverse innovation"

strategy of designing basic product platforms in EMs and upgrading them later on for worldwide sales may prove successful in the future (Immelt et al. 2009). CLAAS—an agriculture machinery manufacturer—for example, sells harvesters developed in India in other Asian and African countries (Forkert 2009). Siemens on the other hand successfully launched a computed tomography device developed for the Chinese middle market in its R&D center in Shanghai also in Germany and the United States.

11.4.2 Barriers

Notwithstanding the many benefits MNCs derive from their R&D sites in EMs, there are also some roadblocks they have to circumvent in order to succeed (see again Fig. 11.2). First and foremost, for many firms, EMs are relatively new additions to their business landscapes. This is exacerbated by the fact that many EMs differ to a high extent from the MNCs' home markets (Sheth 2011). In general, they are highly volatile with local competitors used to react quickly to changing buyer preferences as well as have distinct customer patterns. Lacking experience with local specificities makes it particularly difficult to establish R&D sites as they push into the very core of the firm's value chain, involve high investments, and are dependent to a high extent on local scientific and industry ties which are likely to be poorly developed at the beginning.

Second, many companies we studied pointed to the relatively high employee turnover, particularly in the early stages of the R&D center establishment. This was mostly due to the fierce competition among numerous Western MNCs opening R&D sites in attractive locations of EMs like Shanghai or Bangalore. Often, even small remuneration differences motivated employees to switch jobs from one day to another.

Next, in many cases, HQ employees were skeptical regarding the new R&D operations. Many feared losing their jobs to low-wage countries and thus were reluctant to cooperate with the new sites. In case of our interviewed MNCs, the development of R&D capacities in EMs was not conducted at the expense of domestic operations. What is more, EM R&D laboratories were seen as an extension of domestic operations helping to achieve faster innovation cycles and faster time-to-market and enhancing the existing R&D network with new skills like lean product development.

Finally, many MNCs we studied, like the specialty chemicals manufacturer Evonik Degussa or the laboratory and process technology provider Sartorius, pointed to the threat of IP leakage making the establishment of full-fledged local R&D a challenging task. Some of them like Sartorius spread the responsibility for product components over its worldwide global engineering network in order to minimize plagiarism. IP leakage is connected to both the relatively high employee turnover and differences in national culture as well as a relatively weak IP law

enforcement in some EMs. The good news, however, is that IP protection is improving steadily as local firms start fearing imitation themselves.

11.5 Successful Management of R&D in Emerging Markets

Apart from listing motivations and barriers faced by MNCs establishing R&D in EMs, a second goal of our research project was to sketch best practices helping to overcome the mentioned barriers and succeed with local R&D laboratories. In this context, it is however important to notice that successful local R&D depends on a mix of factors. There is no one dominant best practice. Our studied MNCs demonstrate that a bunch of measures attuned to the new R&D site and to the firm's overall strategy should be adopted. Several internal firm stakeholders like HQ and foreign subsidiary employees are responsible for implementing these measures. With regard to R&D laboratory success, the studied MNCs name, for instance, an above-average number of successful R&D projects, an increasing number of patents and scientific publications, and an above-average assessment of the new R&D site in internal employee reviews as well as a low staff turnover rate.

In the following, we introduce the seven key success factors of establishing R&D in EMs and illustrate them with examples. Further, we show how these factors can help to overcome the mentioned R&D internationalization barriers.

11.5.1 Overview of Success Factors

For most MNCs, building up R&D facilities in EMs is very challenging. The following seven factors representing strategic, cultural, and organizational aspects unveiled by successful MNCs participating in our research project might be a helpful guideline (see Table 11.1).

11.5.1.1 The Presence of a Global R&D Strategy

Generally, the establishment of a new R&D site in an EM should follow a long-term global R&D strategy. This implies the existence of such a strategy. It should clearly define how a company aims to internationalize its R&D and who (which unit) is developing what (which product or component), where (which location), and for whom (which market or customer segment). The allocation decision for R&D tasks should be taken from the perspective of the whole company and according to the competencies of each local laboratory. Often, R&D internationalization decisions, especially to low-wage countries, are perceived as a threat by

Table 11.1 Key success factors

Success factor	What matters?
Strategy	
1. Presence of a global R&D strategy	International orientation; assigning clear roles and responsibilities to all R&D laboratories in the company's international network; long-term horizon; convincing company-wide communication
2. Top management support	Support of the new R&D site with adequate resources and management attention; careful selection of the local managing director
3. Personality of the R&D site managing director	Professional, social, and intercultural competence; excellent network within and outside of the company; international experience; host country experience
4. "Ownership" of development tasks	Assigning interesting tasks to local R&D teams; empowering the local R&D site
Culture	
5. Global innovation culture	Company-wide strengthening of the "belonging to one company attitude"; openness toward other national cultures; knowledge exchange between company sites
Organization	
6. Accurate R&D HR policy	Balancing local expectations and global manageability; company-wide reward systems; intercultural training; transparent communication of the company's core values; time-restricted relocation of R&D employees between R&D sites
7. External and internal networking	Personal relations; local-language-speaking R&D employees; careful selection of potential research partners; internships for students; support for doctoral students; deployment of international R&D teams

HQ employees. However, the MNCs in our research project reported even positive employment effects for domestic facilities. Assigning such tasks just by the way, as a result of decision making on lower hierarchy levels and in an uncoordinated manner to maximize short-term goals, is anything but successful. A volatile relocation of single R&D activities from country to country quickly takes revenge on the firm. The experience of the studied MNCs shows that it can take up to 10 years before a new R&D site in an EM unfolds its full potential. Such a long-term project implicating far-reaching changes within the MNC should be carefully planned.

Siemens coordinates its worldwide R&D activities in so-called Global Technology Fields (GTFs) devoted to technologies of strategic importance to several of its business units. Through the GTFs, Siemens can leverage the potential of its worldwide R&D network. Its researchers work on pioneering technologies in innovation clusters worldwide where customer needs and future markets have been identified (Achatz et al. 2009). The R&D sites also serve as regional centers of competence. Special emphasis in EMs is placed on the development of so-called S.M.A.R.T. products (simple, maintenance friendly, affordable, reliable, and

timely to market) which are designed to compete in price-sensitive local markets. For instance, the Shanghai R&D facility of Siemens Medical Solutions bears the global responsibility for middle and low-end medical equipment (Siemens 2010).

11.5.1.2 Top Management Support

After the long-term global R&D strategy has been decided on, it should be communicated within the company and backed by both material and immaterial resources. Especially a clear, permanent, and visible support of the new R&D center in an EM by the firm's top management is necessary. This motivates local R&D employees on the one hand and enhances the acceptance of the new R&D location within the existing company network on the other. Consequently, potential concerns of employees can be reduced, the so-called not-invented-here syndrome minimized and thus prerequisites for a fruitful cooperation created.

GE's R&D center in Bangalore illustrates the pivotal role played by the company's CEO for the site's development. Without Jack F. Welch—the former CEO—the center would hardly exist in its present form. In fact, the center is named after him—the only R&D facility within GE's network named after a person, not its geographic location. His confidence regarding India's scientific potential is mirrored by his words visibly placed at the R&D center's entrance that "India is a developing country however, with developed minds." Equally convincing was his firm-internal communication that the investment in Bangalore is long term. His clear commitments like "We want to make it big here" or "We are here for the long run" are still present in the laboratory's employees' minds. The present CEO as well as other board members also supports the site through personal visits (Dubiel 2009; Wille 2009).

11.5.1.3 Personality of the R&D Site Managing Director

The personality of the R&D laboratory's managing director plays a central role particularly in the early phases of the center's foundation. When staffing this important position, not only the professional but also the social and intercultural competencies of the candidate should be taken into account. The successful manager should be a respectable, internationally experienced person with numerous contacts within and outside of the organization who is used to work on the interface between different locations and functions and with a direct reporting line to top management. Such managers are often known as "boundary spanners" (Schotter and Beamish 2011). Especially, during the build-up phase, the personal network of the managing director at the firm's HQ is decisive.

Exactly such a personality is Dr. Wille, managing director of GE's Bangalore site between 2001 and 2010. Particularly in the first years of the center's existence, he could heavily build on his wide internal company network. Thus, he was able to overcome several obstacles and to acquire a number of important projects for his

R&D laboratory. Due to his broad international experience in general and Indian experience in particular, he could successfully manage company-wide expectations (Dubiel 2009). His successor is an internationally experienced Indian backing the trend that new R&D centers are planned to be led by medium-term local executives (GE 2011).

11.5.1.4 "Ownership" of Development Tasks

With the proceeding setup of the new R&D site, a gradual transfer of more responsibilities for own, innovative R&D tasks should take place. This contributes highly to the esteem of the local R&D personnel. If the MNC truly plans to build up an innovative R&D facility developing products for local and international markets as well as to attract and motivate the best people, it has to cede some decision-making power to locals. An "extended workbench" approach will not work in the long run. Such a HQ policy manifests itself in a remote control of local decision-making processes possibly even ignoring local specificities as well as the delegation of simple, repetitive activities like testing, documentation, and maintenance to local employees. This has a very discouraging impact on them and can well increase the labor turnover rate with all its negative implications. Only with an on-site responsibility for own R&D projects, the full innovative potential of the R&D site can be leveraged.

Such a local "ownership" of innovative projects can be observed at SAP—the German B2B software giant—where the firm's R&D site in Bangalore is responsible for the development and maintenance of product lines for certain industries (Neumann 2009). Not only software industry assigns interesting R&D projects to Indian subsidiaries. Also, the biggest German agricultural machinery manufacturer CLAAS develops rice harvesters for the Asian market out of its Indian facilities (Forkert 2009).

11.5.1.5 Global Innovation Culture

Of great importance to enhance cooperation between R&D facilities located in different countries is a global innovation culture. Such a culture can be defined as openness to world markets, diverse customer needs, and different national cultures. It asks for the ability to recognize and leverage specific skills, resources, and ideas within the company that are often geographically dispersed (Kleinschmidt et al. 2007). This factor also exemplifies the long-term nature of the R&D site's buildup as company cultures do not evolve within a few months but take years to develop and mature. The firms we studied employ several measures to enhance an organization-wide innovation culture. Most of them are indirect in nature. They impart internal value systems, behavioral rules, and the sense of belonging to one organization. Hence, they support a certain behavior of employees who become more open toward individuals coming from different national cultures, regard the whole

company independently of its geographic locations as one entity, and act in concert with their international colleagues.

SAP places great importance on supporting a global innovation culture by offering intercultural training for new employees, mainly middle management and project leaders (Neumann 2009). New associates in India are, for instance, offered training on "how to work with Germans" as well as German language classes (working language at SAP is however English). Further, a number of exchange programs between the international R&D facilities are in place to foster personal relations. Finally, in day-to-day product development operations, SAP deploys international teams and encourages all employees to make contributions as equals, regardless of geographic location.

11.5.1.6 Accurate R&D HR Policy

The experience of our studied MNCs repeatedly points to the need of a well-developed HR policy to successfully operate state-of-the art R&D facilities in EMs. Its key issues are recruiting and retaining excellent local R&D employees. However, there seems to be no single HR factor that on its own guarantees success. Clearly, it is a mix of many expected and more outstanding measures. The "overall HR package" must be convincing for potential employees as the competition for the very best people, especially in innovation clusters like Bangalore or Shanghai, is quite fierce. Beyond an attractive remuneration, also the firm's image, its product orientation, internationalization degree as well as the job content are important. Likewise, retention of the employed and on-the-job trained individuals should be enhanced. Offering benefits like air-conditioned bus transport or health insurance for family members does not make the difference any more. The assignment of challenging and innovative tasks as well as the definition of personal growth paths is a better incentive. Employee retention might also prove an effective strategy to reduce IP leakage in countries with weak IP protection. Beside local employees, also expatriates from the firm's HQ are relocated to the new R&D site to help build up local operations and enhance ties between central R&D and its foreign subsidiaries. It is crucial to carefully choose these managers both in terms of professional and in terms of social skills as well as intra-firm networks.

Effective R&D HR policy is not a matter of firm size as SUSPA, a German 160 million euro turnover manufacturer of gas springs, dampers and adjustment systems, demonstrates. In its Chinese R&D site, the classic example of a German Mittelstand firm offers attractive monetary and non-monetary remuneration packages for employees. Beside regular salary adjustments, the firm also assesses its employees' performance, creates an attractive work environment, and gradually but continuously promotes its best R&D personnel. To reduce the turnover rate, SUSPA agrees on contract penalties with employees who drop out of the firm shortly after extensive training, pays loyalty allowances, and grants leave days depending on job tenure. Finally, it also employs German expatriates (Erat 2009).

11.5.1.7 External and Internal Networking

Building up R&D facilities in EMs usually goes well beyond the degree of internationalization experienced by most companies in the past. And it exceeds by far the relatively "closed" circuit flow of a foreign production site. The success of the new local R&D laboratory is therefore considerably tied to its integration into the local scientific and industrial community. And to accomplish this, the R&D site has to be regarded in the host country as a local player. This is by far not a straightforward task rather the development of local networks is a long-term investment. While enhancing local ties between the new R&D site and its hosts, the facility should not turn into an isolated island within the MNC's organization. Thus, it should also be integrated in the existing firm network consisting of both other R&D centers and business units.

For a good example of an efficient internal networking, just recall Siemens' GTFs. Their directors have a global responsibility for their technology fields, regardless of geographic location. This minimizes inefficiencies and redundancies often occurring in dispersed R&D organizations. Furthermore, heads of new R&D sites are experienced managers who already have a broad personal intra-firm network. Siemens also fosters its external ties. In order to link itself more closely to scientific institutions, it has established Centers for Knowledge Interchange at selected higher education institutions for instance, in Shanghai and Beijing. It also maintains a Technology-to-Business center in Shanghai which works with local universities, start-up companies, and individual entrepreneurs to transform their innovations into successful businesses (Achatz et al. 2009).

11.5.2 Application of Success Factors

Within the studied MNCs, we identified a mix of factors crucial for a successful establishment of R&D centers in EMs. Implementing these measures allows overcoming certain barriers widespread in EMs and allows MNCs to reap the expected benefits of R&D internationalization into EMs. In the following, we would like to exemplarily demonstrate how the four barriers we identified in our study can be successfully overcome (see Table 11.2).

Inexperience with local markets inhibits MNCs' access to them and limits potential profits from their well-educated labor pool. Without a deep anchoring in local markets, it is very challenging for firms to use these markets as a starting point for low-end product development which might become the basis for worldwide sales. By delegating ownership for certain product lines to local R&D centers, companies like Siemens can both successfully enter local markets and develop products with global potential. Just recall the example of Siemens' computed tomography device developed in China. Similarly, both its extensive local network within research institutes and higher education institutions helps GE

Table 11.2 Success factors help to overcome barriers to achieve motivations

Barriers	Success factors	Motivations
1. Inexperience with local markets	• Ownership • Global innovation culture • Internal and external networking	• Proximity to attractive local markets • Local R&D talent and know-how pool • Stepping stone for global products
2. High employee turnover	• Personality of the R&D site managing director • Ownership • Global innovation culture • Accurate R&D HR policy	• Local R&D talent and know-how pool • Partly lower costs
3. Reluctance of HQ employees	• Personality of the R&D site managing director • Global R&D strategy • Top management support • Global innovation culture • Accurate R&D HR policy • Internal networking	• Local R&D talent and know-how pool • Stepping stone for global products
4. IP leakage	• Global R&D strategy • Accurate R&D HR policy	• Proximity to attractive local markets • Stepping stone for global products

to attract the brightest graduates and convince professors highly regarded in their expertise fields to spend sabbaticals in the company's R&D laboratories.

An employee turnover above the rates usually experienced by the studied MNCs in more industrialized countries makes it difficult to fully leverage the potential of the local labor pool. If employees quit shortly after their hire, the company cannot profit from their know-how. Moreover, high recruiting investments as well as training costs for constantly new personnel increase total local costs. With the help of an attractive work environment and assignment of innovative projects, companies like SAP are able to reduce their personnel attrition rates well below the local industry average. Due to its appealing working atmosphere and company culture, SAP Labs India has received numerous awards. Both SAP and GE underscore their R&D sites' high product orientation to convince local S&T personnel to plan their careers long-term in-house.

Reluctance of HQ employees with regard to the new R&D sites in low-wage countries is relatively widespread. It seriously hampers the integration of the new R&D site into the firm's existing R&D network and diminishes potential benefits from the new site. If solely back-office operations are transferred to EMs—which is often uncritical from the perspective of HQ R&D—it will be difficult to retain above-average local R&D employees who expect innovative and value-adding tasks with regard to new product development. And without qualified local personnel, also the potential of a stepping stone for global products cannot be realized. Of crucial importance are in this regard top management support and the

personality of the new site's managing director. Just recall the examples of GE. Without a clear positioning of the firm's CEO in favor of the new site and an extensive company-wide lobbying for assigning exciting tasks to the new laboratory by the local managing director, an integration of the EM R&D site is much more difficult.

Finally, IP leakage refrains many MNCs from entering EMs and thus prevents them from using the local fertile ground for local product development with global potential. Two measures mitigating this can be observed within the studied MNCs. First, a global R&D strategy like at Sartorius helps to clearly assign particular tasks to particular R&D laboratories. Spreading responsibilities globally and/or retaining some core competencies at HQ helps to keep crucial IP within the company. Second, Sartorius also tries to reduce turnover rates among its existing employees and uses extensive training sensitizing employees against plagiarism.

11.6 Conclusions

Emerging economies have become increasingly attractive sales markets and sourcing locations for Western MNCs. To fully profit from both developments, pioneering MNCs establish local full-fledged R&D laboratories. These activities are not always risk-free, but the examined MNCs show that advantages seem to outweigh the associated costs. The studied companies—representing different industries and sizes—independently report a number of factors enhancing the buildup and management of captive local R&D centers. They do not claim to be exhaustive; however, they raise a number of important issues which are worth to be considered. First and foremost, there are some strategic aspects. R&D centers in EMs have to be embedded in a clear, long-term international R&D strategy, backed by top management, and assigned a managing director accustomed to working in an international environment and well-networked within and outside of the MNC. Many of the examined firms also gradually delegate more and more challenging R&D activities to their new R&D sites and promote them to equal partners in their international R&D network. Further, cultural aspects come into play. A global innovation culture proves to be a strong booster of a company-wide cohesion. Finally, organizational factors like broad HR measures to recruit and retain the best local personnel as well as the integration of the R&D site into the existing MNC network are of great importance. All these measures can help to better reach the aims of R&D internationalization into EMs and circumvent some of the main barriers.

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Chapter 12
Toward a Flexible Breathing Organization: R&D Outsourcing at Bayer

Lydia Bals, Kyra Constanze Kneis, Christine Lemke and Torben Pedersen

Abstract Although R&D is at the core of knowledge-intensive industries like Pharma, outsourcing parts of its activities hold considerable efficiency and effectiveness potentials. That means managers must understand, which R&D activities can be outsourced and which need to stay in-house in order to ensure competitiveness. Nevertheless, systematic approaches for understanding the finer details of the decision-making process on R&D outsourcing are lacking. To address this gap, we present a framework developed in the context of a multinational company, Bayer. The combination of literature studies and the study of the decision process in the pharmaceutical division at Bayer HealthCare allows us to unfold an outsourcing process model—the filter approach—that includes appropriate decision phases and proper tools. The underlying logic of the model is that outsourcing decisions are rather a learning process with different stages than a rational one-off decision.

L. Bals (✉) · T. Pedersen
Department of Strategic Management and Globalization,
Copenhagen Business School (CBS),
2000 Frederiksberg, Denmark
e-mail: lb.smg@cbs.dk

T. Pedersen
e-mail: tp.smg@cbs.dk

K. C. Kneis · C. Lemke
Bayer Business Services GmbH—Business Consulting, 51368 Leverkusen, Germany
e-mail: Kyra.Kneis@Bayer.com

C. Lemke
e-mail: Christine.Lemke@Bayer.com

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12.1 Toward a Flexible Breathing Organization: R&D Outsourcing at Bayer

The pharmaceutical industry is a research-intensive industry with long development cycles, and in recent decades, pharmaceutical research and development (R&D) has faced major challenges. Most of the easily approachable indications or targets have already been addressed, and it is becoming increasingly difficult to find new targets or develop medications offering additional benefits. At the same time, regulatory authorities are paying more attention to the safety of new medications, which raises the approval hurdles. An average drug costs about USD 1 billion in R&D, and the average time to market is 10–15 years (DataMonitor 2011; Masia 2006; Adams and Branter 2009). This order of magnitude is further aggravated by current trends: R&D costs are increasing steadily and at a faster rate than sales (Weiss et al. 2009; CMR International 2009; Evaluate Pharma 2009). Although there have been efforts to lower costs, particularly in light of the recent financial crisis, productivity is lagging (Evaluate Pharma 2009; David et al. 2009; Morgan Stanley Research Europe 2010). Given the pressure from financial markets and the high intra-industry competition, pharmaceutical companies have had to find ways to address this situation. In fact, improved productivity in R&D has become a prerequisite for corporate survival. Moreover, the financial crisis has highlighted the importance of flexible capacity. In companies where 100 % capacity is held in-house, it will typically take longer time to react to fluctuations in demand.

Outsourcing is one possible way to increase productivity as well as increasing flexibility in R&D. Therefore, the extent of outsourcing of R&D activities has increased significantly in recent years, which has improved the ability to respond to demand fluctuations (Howells et al. 2008). It is mainly the more standardized part of the R&D value chain that has been outsourced to external providers, which have allowed companies to leverage cost-efficiencies and scale benefits, use internal capacities more effectively and focus on core activities. Few pharma companies can afford to ignore the cost savings that can be gained from outsourcing of more standardized R&D activities. A pressing question for pharmaceutical companies is how to best organize the R&D activities in order to improve productivity and flexibility: Which activities to keep in-house and which to outsource? These considerations require a thorough understanding of the R&D value chain activities and how these activities are interlinked. However, what is the appropriate process to apply for companies in order to decide on the proper organization of the R&D value chain activities? What is best practice in decision-making process on R&D outsourcing?

In the following, we will first discuss insights gained from the literature outlining the proper stages in the outsourcing decision process, and then, we will scrutinize and unfold a specific case of outsourcing decision. The specific case is the pharmaceutical division of Bayer HealthCare, structured decision-making process on outsourcing of preclinical development activities. When Bayer set out

to optimize its set-up within its preclinical development in 2008, everything was still done in-house. However, it then started a journey that led to the development of a structured approach to making R&D outsourcing decisions. What is highlighted here is that in practice, the make-or-buy decision cannot be boiled down to one calculative choice, but does entail a number of steps or gates that needs to be passed in order to make an informed decision on the R&D outsourcing.

12.2 Decision-Making Process of R&D Outsourcing

Within R&D, one main method of accessing external sources during the clinical and preclinical phases of R&D is through outsourcing. The basic idea is that the firm should be able to better leverage core competences—the firm's core internal skills and available resources—if it outsources non-core activities for which it does not have sufficient in-house expertise (Sen 2009). Basically, pharma companies are moving from a model of in-house handling and full ownership of R&D activities toward a model in which the focus is on the orchestration and combination of internal and external R&D inputs.

One implication of this shift is that pharma companies need to develop new competences related to the coordination and integration of knowledge and research stemming from different individuals and groups (Teece et al. 1997). Competition previously centered on the quality of internal R&D, but this focus has shifted to the best ways in which to appropriate value when combining internal R&D with external R&D inputs from outsourcing partners. Therefore, the drawing of the boundaries of the firm and decisions regarding which R&D activities to keep internally and which to outsource have become pertinent issues for all pharma companies.

Existing literature on R&D outsourcing is mainly derived from the transaction cost theory and the resource-based perspective and such studies tend to adopt, either consciously or unwittingly, a calculative approach to outsourcing decisions (Ulset 1996; Mol 2005). Many possible determinants of R&D outsourcing decisions have been identified in this literature, including the characteristics of the tasks, the characteristics of the outsourcing companies and relationships with the external partner.

The studies in this line of research seem to indicate that the change from internal sourcing of R&D activities to outsourcing is a rather simple, calculated, strategic decision (Howells et al. 2008). The view is based on an economic approach, and its fundamental assumptions are that firms have full information and are quasi-rational in their choices. The implication is that once the cost and benefits of specific outsourcing projects are known, there is little room for managerial discretion.

This rational calculative viewpoint is contested by more longitudinal in-depth studies of how companies make outsourcing decisions in practice. These studies indicate that such decisions are not necessarily one-offs and that they, in actuality,

encompass a learning process and several phases (McIvor 2005; Piachaud 2004). An outsourcing decision is not just the result of a simple cost-benefit calculation. It reflects more often a decision process, which is treated more like an innovation process with different "gates" at which risks, capabilities, costs and benefits are assessed (similar to a Stage-Gate model for technical innovations).

12.3 A Model for Outsourcing Decisions

Based on studies of outsourcing decision, Van de Water and Van Peet have proposed a model developed for the manufacturing context that highlights the main phases of the outsourcing decision-making process (Van de Water and Van Peet 2006; Platts et al. 2002; Probert 1996). This model (Fig. 12.1) emphasizes that the decision process includes three distinct phases: (1) determining the performance objectives, (2) determining the relevant capabilities and value chain activities and (3) determining the type of relationship with the supplier(s). In the following, we scrutinize the three phases and the specific considerations related to each phase, as they provide the background and inspiration for our subsequent study of Bayer's outsourcing decision model.

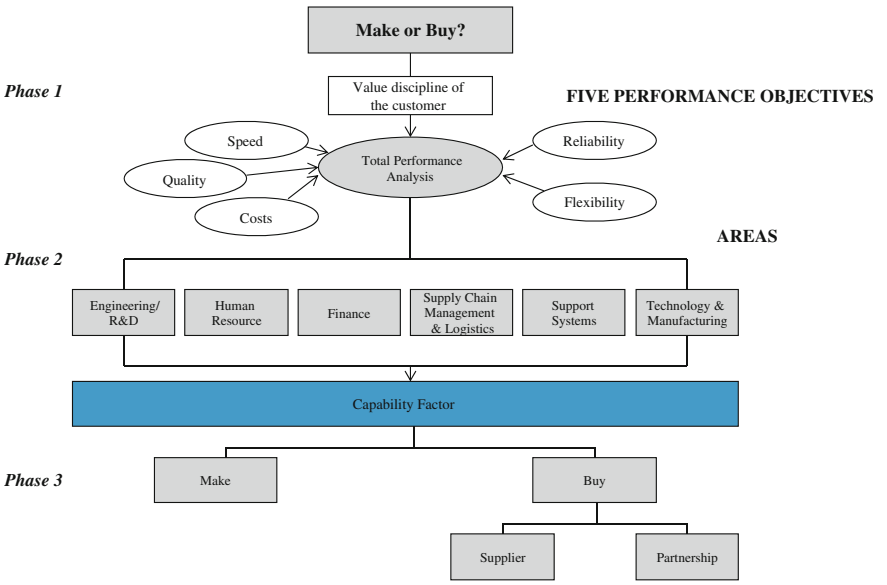

Fig. 12.1 A three-phase model for the make-or-buy decision (Van de Water and Van Peet 2006). (this figure is reproduced with kind permission of Elsevier © August 11, 2012)

12.3.1 Phase 1: Determining the Performance Objectives

The first phase centers on determining the performance objectives. The following five main performance objectives of outsourcing are emphasized: cost, quality, speed, flexibility and reliability.

Cost considerations: One important factor in outsourcing decisions is costs. Depending on the R&D value chain activity in question, significant cost differentials can exist among different locations.

Quality, reliability, flexibility and speed: There may be benefits to outsourcing apart from those related to costs that have not been sufficiently examined from a theoretical perspective. Such benefits may include access to new markets, brand exposure, or access to untapped talent pools, as well as the ability to flexibly respond to changing markets (Gupta et al. 2007; Tate et al. 2009; Farrell 2005). In the context of R&D, in particular, the time factor has a significant impact on the potential revenue generation.

12.3.2 Phase 2: Determining Capabilities and Activities

Phase 2 focuses on the assessment of the company's own capabilities relative to the potential benefits identified in Phase 1.

In the R&D setting, the task of global strategy increasingly "is to determine the optimal level of disaggregation of the firm's operations over its entire value chain, to then determine the optimal global allocation of each piece" (Contractor et al. 2010). Activity analysis implies that the companies learn about their operations and processes (while assessing possibilities for standardization, new ways of bundling and potential for improved scale) in order to specify interfaces and coordination mechanisms. Through this process, true core activities (distinctive and crucial to competitive advantage) and essential activities (advanced activities that are complementary and important for competitive advantage) can be differentiated. Notably, firms are increasingly micro-analyzing their activities and dissecting their value chains into finer slices. This trend is now also evident in R&D, which has traditionally been viewed as a key activity that was previously located close to the heart of the company (Contractor et al. 2010).

Internal and external interfaces. Internal and external customer relationships must be considered. This applies equally to internal and external customer interfaces, where external interfaces are particularly vulnerable because they are, ultimately, the source of revenue generation. Internal interfaces can arise when business processes, such as parts of accounting or HR, are outsourced. In this case, the provider will have multiple interfaces with the internal employees that they serve. External relationships refer to customers buying the focal company's own products and services.

Internal relationships are particularly relevant in terms of the way in which globally dispersed R&D operations are organized and steered. If a global hub approach or a decentralized approach to R&D is in place, outsourcing R&D will affect a multitude of internal interfaces. However, if R&D is relatively centralized, there will be a central interface with the external providers. In addition, the effects of increasing R&D collaboration and networked operations have to be taken into account, which puts more emphasis on the ability to manage a network of relationships and to incorporate outsourced R&D activities into the overall web of activities in a meaningful, value-accretive manner.

Mobility. In terms of mobility, a global scope implies greater complexity in the evaluation of alternatives than the complexity associated with decisions made in an onshore or near-shore setting. In the global consideration of alternatives, a service may be outsourced to a provider operating in several locations or it may be allocated among various providers in different locations. These possibilities give rise to additional organization and communication challenges.

Again, the focus on human potential in service provision highlights the challenges: service providers must produce comparable outputs, and they have to be managed and connected within a global service delivery network. While physical assets can be moved (albeit at a cost), some services may be immobile, especially when specific knowledge is involved. However, suppliers of commodity services can be switched relatively easily. Therefore, the ability to integrate service providers into the R&D process in question becomes crucial.

12.3.3 Phase 3: Determining the Type of Relationship with the Supplier(s)

The relationship with supplier(s) is determined by considering the type of activity that is a candidate for outsourcing, while simultaneously considering the value discipline of the customer. In our context, these two factors relate to the type of R&D service in question.

The number of participants in a company's supply chain, as well as their level of diversity, increases with decisions to outsource. Furthermore, a decision to engage in cross-border engagements with suppliers implies a need to consider various issues, such as how to cooperate efficiently across different (e.g., cultural) boundaries, how to create and transfer knowledge produced in the relationship, how to protect critical proprietary intellectual rights and how to ensure steady service provision, especially in situations of growing dependence on a highly customized supplier. These challenges are aggravated in the services context, as knowledge and innovations may be more tacit than they are in a goods context. This creates specific challenges related to knowledge diffusion and retention.

These considerations are further amplified in the R&D setting, as intellectual property (IP) protection is of paramount importance in protecting revenue

generation and compensating for R&D costs. Therefore, the identification of activities that can be outsourced without IP threats, as well as the selection of trustworthy, reliable suppliers or partners, becomes critical success factors. In addition, a careful analysis of the IP environment in which the respective suppliers operate is necessary for an accurate assessment.

The need to find appropriate suppliers relates to the issue of industrial clusters. The management of dispersed networks and industrial clusters requires new capabilities. This makes it necessary to be continuously aware of developments in such clusters in order to fully grasp the implications of such a shift.

In the R&D context, this is reflected in the need to continuously monitor the global R&D landscape to record the manifestation and growth of new company clusters and academia-industry networks (such as those seen in Singapore). Furthermore, knowledge of talent pools within the R&D landscape (such as in India or in China) must be gathered and maintained.

The three phases in the outsourcing model by Van de Water and Van Peet are pointing at the main phases and headlines of the decision-making model, and in that sense, it is a very powerful model. However, the model is still short of specific tools on how to conduct the proper investigations on each stage, so decisions can be made on the different stages. In order to flesh out some of the relevant tools on the different stages of the outsourcing decision, we turn our attention to how the decision process is conducted and used in practice in Bayer. The intention is to gain more insights into those details of the model that are discussed more superficially in the literature. More specifically, we examine Bayer's outsourcing decision process and explore how the company has determined its objectives, identified suitable activities and assessed its internal capabilities and external partners. In doing this, we will be able to specify the decision model further in the context of knowledge-intensive firms.

12.4 The Bayer Case: Need for Flexibility

Bayer HealthCare is a sub-group of Bayer AG, and it is one of the world's leading innovators in the field of pharmaceutical and medical products. Bayer HealthCare encompasses research, development, manufacturing and marketing activities related to innovative products that improve the health of people and animals. Bayer HealthCare has four operating divisions: Pharma, which focuses on prescription medicines; Consumer Care, which focuses on over-the-counter medicines and dietary supplements; Medical Care, which deals with blood glucose monitoring devices and contrast agent injection systems; and Animal Health, which focuses on veterinary medicines and grooming products.

Bayer HealthCare offers a suitable setting in which to address the research questions for several reasons. First, as a company dedicated to research and innovation, Bayer HealthCare is an appropriate environment for the study of decision making as it relates to the high-value/core activities of an R&D-intensive life science company. Second, the company recently made outsourcing decisions

in the areas of preclinical drug metabolism, and pharmacokinetics and toxicology, which allows us to directly observe decision making in an R&D context.

In the following, we will unfold the decision-making process of outsourcing within preclinical development as we believe the decision process model at Bayer HealthCare provides a lot of insights that go beyond the case itself. In particularly, we examine the decision-making process in more details for the two areas of drug metabolism and pharmacokinetics (DMPK) and toxicology.

Bayer HealthCare's R&D outsourcing approach was jointly developed by the department for preclinical DMPK, the department of toxicology and R&D experts from Bayer's in-house consultancy unit "Business Consulting." DMPK and toxicology have been full-service providers in the past. However, the company recognized that it would need to become more flexible in the long run. Outsourcing was viewed as an option that could compensate for fluctuating activity peaks.

Bayer HealthCare's outsourcing decisions for R&D were formed and conducted with experienced specialists and managers from the R&D function, as well as experts from the in-house consultancy. The approach and material were later analyzed by researchers for this article. Bayer's R&D outsourcing decision process model was developed in several phases that correspond to the project phases: a set of workshops to assess current practice and company experience, comparison with other outsourcing frameworks from the literature, the development of a research-based framework, refinement and final testing. Throughout this development process, the main reiterations revolved around the number of filters and the criteria. The final model's three-filter approach is depicted in Fig. 12.2. Outsourcing frameworks in the manufacturing area typically apply only two filters. However, in this the research setting, three filters were considered more appropriate given the desire to obtain a more detailed view of the individual activities in order to assess the practicality of outsourcing *before* external offers are sought. The functional experts of Bayer HealthCare agreed with this approach.

The following statements illustrate how participants view the model. In terms of the need to differentiate between core and non-core activities, it became clear early in the process that activities needed to be rethought and then re-bundled:

> We needed to be precise about what we considered to be core activities. "The criterion "of strategic relevance to the company" was not enough—that needed to be detailed. The criteria developed in the framework helped us to be fully transparent on this point" (Project Manager, Bayer Business Consulting) and "The system behind the model is simple: a company should plan its resources based on core activities. With few exceptions, everything else can be handled by third parties. Given fluctuations in the workload of core activities, outsourced activities offer a major benefit: in times of low core workload, outsourced activities can be performed internally. This ensures that our resources are always used in the most efficient way" (Principal, Bayer Business Consulting).

In terms of the need to define short- versus long-term capabilities, one major issue was the desire to retain as much essential human talent as possible. Although the application of the filter analysis was very critical on the activity dimension, one repeatedly mentioned focus was the need to keep as many internal capabilities embedded in the personnel as possible in order to fulfill future requirements:

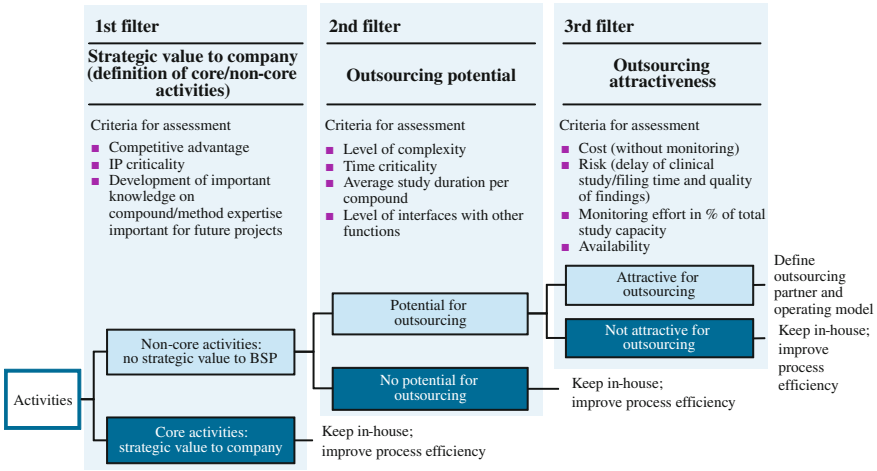

Fig. 12.2 Three-filter approach to R&D outsourcing

> We considered the expected future increase in the workload when we assessed our personnel resource requirements. To do otherwise would have been unfair to our employees, and we would have dismissed core competencies that we would have needed to hire back in a few years (Department Head, DMPK).

When comparing internal and external performance, participants showed a clear understanding of current strengths and weaknesses early on in the development of the model, as benchmarking had been performed previously. These benchmarks indicated that the primary goal of outsourcing would be related to flexibility rather than costs:

> Our total costs were already below pharmaceutical industry benchmarks. When we compared contract research organization (CRO) study costs for non-core studies with our internal study costs, we found ourselves in a comparable and often more favorable cost position, especially if one considers the usual additional monitoring efforts required for externally conducted studies. In other words, outsourcing was not cheaper in itself but it made us more flexible (Head of Global Early Development).

When discussing the overall intention of outsourcing, participants stated that the goal was to create an organization with more flexibility and permeable boundaries (a "breathing organization"):

> We recognized that we cannot do everything in-house. We needed to become more flexible and create a "breathing organization" (Head of Global Early Development).

12.4.1 Toward a Systematic Outsourcing Filter Approach

Each activity is put through the filters in the R&D decision process model. In this process, the first filter assesses the strategic value of the activities to the company

from an internal perspective. Actions with strategic value are considered to be core activities and are kept in-house. The second filter is used to assess non-core activities in terms of whether they are, by their nature, suitable for outsourcing. Non-core activities that do not have inherent outsourcing potential should be kept in-house. Activities with outsourcing potential are then assessed in the third step. This third filter takes all important external framework conditions, including costs, quality and risk, into consideration. Only activities that pass through all three filters should be outsourced. The filters are shown in Fig. 12.2.

If an organization does not have the necessary resources to perform strategically valuable activities in-house, outsourcing must also be considered for those activities. In the long run, however, each company should focus on those activities that provide it with a real strategic advantage.

12.4.1.1 Filter 1: Strategic Value

Several important criteria are used in the assessment of strategic value. The first is *competitive advantage*. Some activities might be rare on the market, and keeping of these in-house might provide a competitive advantage, perhaps in terms of knowledge development or speed. The second criterion is *IP criticality*. Activities that involve vital intellectual property rights should not be outsourced. The third criterion is the ability to *develop knowledge important for future projects*. When testing compounds, method expertise or knowledge on new substance classes might be created that could be important for future projects.

Each criterion was assessed by the internal company experts on the basis of a three-level scale (high, medium and low). Based on the assessment of these criteria, the experts made an overall assessment of the strategic value of each activity, which was also based on a scale ranging from high to low. In this process, the assessment criteria were applied to the individual activities with different weights. Generally, "competitive advantage" and "IP criticality" were assigned a higher weight in the overall strategic assessment than the "development of knowledge."

One important consideration related to IP criticality was need to ensure exact, high-quality study results, regardless of whether those results were obtained through in-house or outsourced studies. As regulatory authorities might ask for additional data (beyond the usual contents of a study report issued by a third-party provider), failure to ensure that this requirement has been met when working with a third-party provider can result in significant delays or even project cancellation if the information is no longer retrievable (a situation that might be caused by a change in personnel at the provider).

The individual rating and weighting of each criterion, however, depend to a great extent on the company and the department under examination. Activities with a high overall strategic value should be kept in-house. Activities with a medium or low strategic value pass on to the second filter. The following examples illustrate the application of this filter at Bayer HealthCare.

In the first filter, a set of long-term animal DMPK bioanalytics studies were found to provide no real competitive advantage and the related IP situation was assessed as non-critical. Both criteria were therefore rated "low." The development of knowledge on the compound through the performance of studies in-house was assessed as "medium." Based on all three criteria, the overall strategic value of these DMPK studies was rated "low" and this activity was passed on to the second filter.

In toxicology, a mouse lymphoma assay was assessed as having a low competitive advantage and medium IP criticality. The development of additional knowledge was assessed as high. Overall, the strategic value of this study was assessed as "low," which was mainly based on the competitive advantage assessment. This study was also passed on to the second filter.

12.4.1.2 Filter 2: Outsourcing Potential

The second filter assesses the outsourcing potential of non-core activities, regardless of the activity's availability on the market, the related cost or the resulting quality.

Four criteria are used for assessment in this filter. The first is the *level of complexity*. The more complex an activity and/or the higher the necessity of making adaptations based on the findings, the more expertise is required to run a study properly. The second is *time criticality*. The shorter the given timeframe, the higher the inherent risk of time delays resulting from use of an external provider. For example, additional time must be spent with external providers to handle the initial briefing and to review the results. The third criterion is *the number of interfaces with other functions*. The lower the number of interfaces with other functions when planning and performing a study and interpreting the results (aside from standard study initiations and data handovers), the smoother and quicker a study can be performed in-house. The final criterion is *average study duration per compound*. Very short studies, for example, those lasting only a few days, might not be worth the outsourcing effort and can often be more easily handled in-house.

Criteria 1–3 are assessed on a scale ranging from high to low. The average duration per compound was assessed in units of real time. On the basis of these criteria, the experts made an overall assessment of outsourcing potential of each activity, which was also based on a scale ranging from high to low. Activities for which the overall outsourcing potential was rated "low" should be kept in-house, while activities with "medium" or "high" outsourcing potential pass on to the third filter.

The two examples presented in conjunction with the first filter were also rated against the second filter's criteria. DMPK's animal long-term bioanalytics studies' level of complexity was ranked "low," while time criticality was rated as "medium." The average study duration per compound is one to three months, and the studies have a medium level of interfaces. Based on these criteria, these

studies were found to have high outsourcing potential and they were passed on to the third filter.

In contrast, the mouse lymphoma assay in toxicology was rated as having a low level of complexity. Time criticality, however, was assessed as "high," as this was one of the studies defining the critical path in toxicology. The average study duration was 13 weeks, and few interfaces with other functions within the company were necessary. The overall outsourcing potential was assessed as low, mainly due to the time criticality of the activity. In general, time criticality proved to be a major hurdle for activities in the second filter. In the case of the mouse lymphoma assay, the toxicology department decided to perform these studies in-house.

12.4.1.3 Filter 3: Outsourcing Attractiveness

The third filter, outsourcing attractiveness, takes market conditions into consideration. The assessment criteria for this filter cover four aspects. The first *is availability*. Activities can only be outsourced if the service is available externally. The second, *cost*, reflects the costs of the activity if services are sourced externally but does not include internal time spent for briefing and monitoring. The third criterion, *monitoring effort as a percentage of total study capacity*, focuses on the ratio of internal time that would be required for the study to the effort required to monitor the study if it is conducted externally. The final criterion, *risk*, includes all risk factors, including potential time delays, and insufficient quality of the research or the resulting data. The risk assessment must take any longer-term threats, such as potential delays in filing or safety issues once the product is on the market, into account. If the inherent risk of outsourcing is too high, studies should be performed in-house.

In terms of availability, the importance of good laboratory practices (GLP) must be mentioned as one criteria that will make supplier selection in some destinations (e.g., India and China) difficult given the risk to benefit ratio (i.e., the ratio of a risk-delayed regulatory approval—or no approval at all—to the benefit of lower costs). Therefore, this is also the criterion that directly corresponds to the location question. Any type of delay translates directly into high financial losses, as each day of lost exclusivity impairs a company's ability to reap the payback from drug development. This was one of the main reasons that these destinations did not pass through the third filter.

The nature of DMPK's long-term animal bioanalytics studies qualified them for outsourcing. However, whether outsourcing was attractive was to be clarified in the third filter. The CRO costs were moderate, while the associated risk was assessed as "low." The additional internal monitoring effort that would be required was rated as "medium," and the availability of external services for these studies was found to be "high." Overall, animal long-term bioanalytics studies were assessed as having medium outsourcing attractiveness. In other words, these studies qualify for outsourcing.

After developing the final R&D outsourcing filter model, it was applied to the existing service landscape for all DMPK and non-clinical toxicology activities. The distribution of activities along the R&D value chain regarding the suitability for outsourcing is shown in Fig. 12.3.

Not surprisingly, most activities in the early research phases were considered core given their IP criticality, related opportunities to develop or gain important knowledge on the compounds, and time criticality, which imply that they should be handled in-house. The closer the activity was in the development chain to product launch, the more likely it was that the activity could be outsourced. As shown in Fig. 12.3, the likelihood that an activity will pass through the three filters depends on its placement within the R&D value chain. For research, many activities will be blocked from further consideration of outsourcing suitability at the first filter. However, at later stages of development, activities are more likely to pass through to the third filter, where the question is one of the outsourcing attractiveness—the availability of suitable external providers, the cost proposition and similar considerations.

This is reflected in the input–output relation of the model. In total, 33 DMPK and 59 activity clusters were assessed. Of these, only 8 DMPK and 32 toxicology activity clusters passed through to the second filter. The rest were considered of high strategic relevance to the company. In the second filter, three DMPK and nine toxicology activity clusters were classified as having no or little outsourcing potential. The remaining 5 DMPK and 23 toxicology activity clusters passed through to the third filter, where 4 DMPK and all of the toxicology activity clusters were found to be attractive outsourcing candidates. The fifth DMPK study cluster was found to have high external study costs.

Bayer HealthCare found that the framework offered several benefits. First, it was intuitive to use. Second, it enabled management to easily determine which activities would be suitable for outsourcing.

In addition to the specific activities that the analysis indicated could be outsourced, several of Bayer HealthCare's core activities were already outsourced, as the in-house knowledge necessary to handle those activities had not been

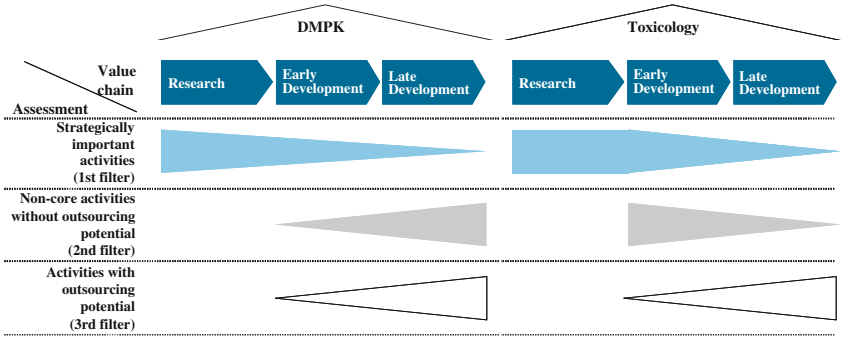

Fig. 12.3 Filter results for DMPK and toxicology

sufficiently built up within the organization. Outsourcing was therefore chosen as an interim solution until these activities could be completely handled in-house.

12.4.2 The Framework in Action: Core is Not Core Anymore

In general, the application of the outsourcing framework allowed for the identification of concrete activities that could be sourced externally in the future. Such opportunities for outsourcing help to support a "breathing" organization that can balance workload highs and lows by highlighting areas in which external resources can be flexibly switched on and switched off on demand. Furthermore, activities that actually qualify as "core" may be viewed as candidates for outsourcing. This particularly applies when the necessary internal knowledge and resources are not available in the short term. Nevertheless, the importance of bringing in this knowledge and building up the resources necessary to handle these activities in-house needs to be emphasized. When core activities are kept in-house, strategically vital information and skills stay in the hands of the company. In that sense, Bayer HealthCare follows a resource-complementation strategy in its outsourcing rather than a purely non-core cost-efficiency strategy, therefore this resembles a case of strategic, rather than tactical, outsourcing (Jahns et al. 2006; Javalgi et al. 2009). Moreover, the case illustrates that core activities are not static, but change over time as markets change, too. Therefore, regular reviews to assess the outsourcing potential are important elements of readjusting strategically. Applying systematic frameworks, such as the one presented here in the research context help in making this process explicit and reproducible.

The model can be applied to other R&D settings as well. The basic filters would apply to many contexts, although the criteria would require some adaption, as this case focuses on the specific needs of the research setting, precisely speaking of DMPK and non-clinical toxicology. In order to be applied to other contexts such as the development setting, the criteria would have to be reassessed. The criteria that would most likely have to be interpreted differently include *IP criticality, development of expert knowledge on the compound* and *study duration*, as they have a different importance in development than in research. Other filter criteria, such as *complexity* and *time criticality*, as well as the entire third filter, can probably be used in a similar form.

12.5 The Core of the Future: Quo Vadis R&D?

The filter approach can practically help in the structuring of decision making in a setting that is not highly outsourcing intensive. As emphasized, outsourcing's main benefits are related to time, costs and flexibility. The latter can be represented by

the metaphor of a breathing organization that can balance capacity utilization with a focus on core competencies.

Moreover, the case presented here demonstrates that at times, it can make sense to deliberately outsource core activities for which there is not enough in-house knowledge or resources. The need to outsource such activities also highlights those areas in which more in-house expertise is needed in the mid- to long term. On the external side, what starts as an arm's length relationship may actually develop into more hybrid setups, such as alliances or joint ventures. In this sense, the systematic approach provides an opportunity to think through the company's own value proposition and priorities to foster strategic clarity and simultaneously achieve a joint understanding inside the company.

In terms of the desire for flexibility in adapting to demand fluctuations, the model proposed here can help firms identify those activities most suitable to create a "breathing organizations." In such an organization, when demand drops, it is easier to protect internal core employees from layoffs by reducing or eliminating external support, and redistributing core, essential and non-core tasks internally until demand improves. This serves as a highly valuable mechanism for ensuring that core employees' critical capabilities are retained.

This study also provides outsourcing-related insights into high-skill, knowledge-intensive research settings. R&D is an area in which outsourcing has long been controversial. The more generally accepted path has been to keep R&D in-house and close to headquarters. The case studied here illustrates that companies can move beyond that general perception to further develop their non-core and core activity portfolios via systematic analyses of outsourcing opportunities.

Moreover, given our finding that some activities close to the core can be outsourced, we suggest that the distinction is not only one of "core" versus "non-core." The core activities are shrinking in the sense that many "essential activities" previously considered as part of the "core" will be target for outsourcing and offshoring in the future.

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Part IV
Firms Risks and Influence from Locational Factors

Chapter 13
The Service Offshoring Code: Location Efficiencies for German Firms

Robert Fraunhoffer, Amit Karna and Florian Täube

Abstract Due to unique task characteristics, different location requirements exist, which ultimately lead to unique location considerations. Based on our research, five decision factors are identified for service offshoring: wages, education, infrastructure, cultural distance, and corruption. Considering these decision factors, efficiencies for the offshoring locations are computed with a data envelopment analysis from a German point of view. The research concludes that the most efficient service offshoring countries, with an average efficiency of 97 %, are the Netherlands, Switzerland, the United Kingdom, and the United States.

Keywords Service offshoring · Location efficiencies · DEA

13.1 Introduction

Offshoring can be broadly divided into two segments, namely into manufacturing and service offshoring. Though, on the one hand, manufacturing offshoring (often referred to as outsourcing) has a much longer history, it requires less-educated employees because the advanced functions are completed within the technical and

R. Fraunhoffer (✉) · A. Karna · F. Täube
EBS Business School, Rheingaustrasse 1,
Oestrich-Winkel 65375, Germany
e-mail: robert.fraunhoffer@ebs.edu

A. Karna
e-mail: Amit.Karna@ebs.edu

F. Täube
e-mail: Florian.Taeube@ebs.edu

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engineering departments in the home country and only the assembly process is located abroad. Service offshoring, on the other hand, is a fairly new phenomenon with more advanced needs. As manufacturing offshoring aims primarily to utilize low labor cost, the geographical distance appears to be a significant factor; not only to minimize transportation costs, but also to enable expatriate managers to live at home (Daub 2009). However, offshoring high-value-added activities such as research or programming require an advanced skill set. Therefore, in addition to realizing potential cost savings, service offshoring also aims to increase competence by accessing high-talent labor pools. Furthermore, prevailing manufacturing offshoring aspects such as transportation costs can be neglected for service offshoring projects (Daub 2009).

Our chapter places its focus upon service offshoring for two reasons. Firstly, technological advancements in recent years enable firms to take full advantage of the service offshoring potential. In order to survive the upcoming revolution of services, firms will have to redesign their strategy and restructure their organizations by engaging in the offshoring process. Thus, it is of essential importance to enable service firms seeking offshoring to choose the most efficient locations for their operations to ultimately generate profits (Karmarkar 2004, p. 102). Secondly, service functions are of great importance to firms; however, service offshoring has not been extensively explored in the past. A recent study by Roland Berger Strategy Consultants (Roland Berger/UNCTAD 2004) indicates that among 500 major European firms, only 39 % engage in service offshoring. This reluctance to offshore could also be attributed to a lack of knowledge of potential benefits and to the potential execution (Daub 2009, p. 3); however, there is not sufficient literature in this area. Our study intends to address this gap in the case of Germany.

Our research model builds on a study from Bunyaratavej et al. (2008), though they use the United States (US) as the home country. In addition to adopting the model, our study expands on it in several ways. Firstly, the cultural distance measure is extended by the fifth Hofstede dimension (Hofstede 2001), thereby increasing both the significance and the accuracy of this indicator. Secondly, another measure, the political environment, is added, extending the model by a substantial location factor, which will be argued. Thirdly, the output measures of the research models are shaped to increase their expressiveness. Bunyaratavej et al. (2008) measure the degree of service offshoring activities by the number of projects abroad; hence, they assume that the equality in number of projects in a host country determines an equal level of activity. We relax this assumption in our study, in the belief that the number of projects does not directly indicate a firm's commitment. Therefore, to actually capture the degree of activity, the amount of investment is considered. Besides, since our study investigates data with another location as a starting point, we enable a location based efficiency comparison between Germany and the US.

In a nutshell, this chapter thus focuses on the question: What are the most efficient locations for German firms seeking service offshoring? Efficiency in this context is understood as an input/output ratio, with the input factors being the decision criteria for an offshoring location, and the output measures the

performance indicators. Therefore, the following study aims to increase the understanding of the scope of service offshoring for decision makers, by creating an account of where Germany service firms should locate their offshoring activities. Therefore, we look at 27 countries from all continents to pinpoint the most efficient locations from a German point of view. Furthermore, we analyze these country efficiencies in detail with respect to specific location aspects such as infrastructure or cultural difference. This second detailed analysis not only facilitates an increased understanding, but also results in a more precise offshoring location decision, which enables German firms to turn their offshoring investment into a value-creating activity.

13.2 Location Considerations for Service Offshoring

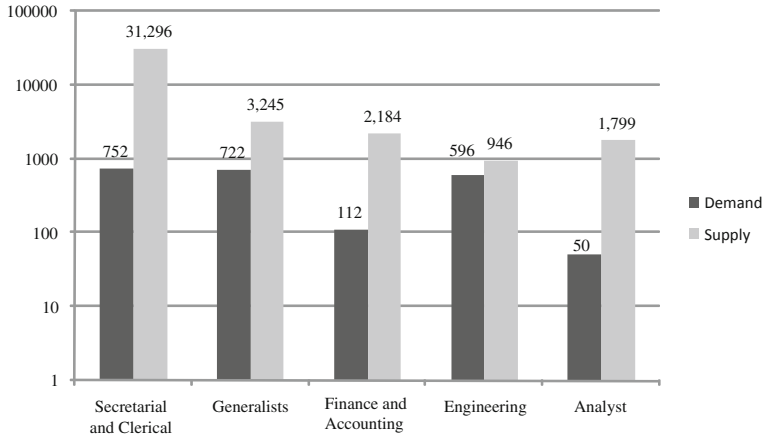
A service job with a qualified employee, a supportive infrastructural environment, and a task that does not require an intense customer interaction may be carried out anywhere in the world. Applying these criteria, 11 % of all service jobs could be offshored globally (Farrell et al. 2006). However, crossing geographical boundaries involves risks and thus proposes several challenges for firms. Therefore, in order to be able to take advantage of offshoring, firms need to assess which locations may serve as the most efficient ones. Based on an extensive literature review, we defined the following five criteria for deciding on service offshoring locations.[1]

13.2.1 Employment and Wage Aspects

One of the main offshoring motives is to reduce wage costs by hiring employees at a lower pay scale than that of domestic employees. Therefore, the local wage level (at the offshore location) is significant in determining the location. However, services require more highly educated employees; therefore, firms must not only consider the wage, but also education level. Current research by Farrell (2006a, b) has showed that the pool of educated low-wage employees has been shrinking over recent last years, especially within the three major offshoring locations of India, Eastern Europe (EE), and Russia. Within the past 15 years, the majority of service offshoring activities have been allocated to Hyderabad, Bangalore, Delhi, Mumbai, Budapest, Prague, and Moscow. Farrell's (2006a, b) research concluded that 90 % of educated low-wage employees are located outside these major regions; therefore, firms need to explore new locations to maintain an efficient education-wage

[1] It yet has to be acknowledged that these chosen inputs may be extended by additional factors such as a country's legal system. Data privacy or patent protection may significantly influence a location's attractiveness. Nevertheless, the chosen input factors are perceived to be the most prevailing aspects and additional ones may add value but solely marginally and thus do not influence the research findings.

ratio (p. 86). This decentralization of talented employees does not, however, result in a demand for low-wage professionals that exceeds the supply. Projections for the year 2008 issued by the McKinsey Global Institute, indicate that the supply significantly exceeds the demand, in particular with regard to secretarial and clerical as well as analyst functions (see Farrell 2006a, b).



13.2.2 Educational Aspect

Seeking talent globally has become the second main motive for offshoring next to the reduction in labor costs (Lewin et al. 2008). It has been concluded that the better educated the employees, the better the delivered service. Thus, the education level of an offshoring location is of significant relevance. Research by Farrell (2006a, b) has shown that in developing countries, the number of university graduates increases by 5.5 % annually while in developed countries by only 1 %. This finding might be partially biased, due to the fact that the base of the developed countries is bigger; however, the fast growth of the developing nations is shrinking the gap (p. 88). Furthermore, there are significant numbers of university graduates available in developing countries. However, the question arises whether the university standards meet Western standards and can be viewed as equal. Studies of the service offshoring potential conclude that in 2008, 19.4 million jobs could have been offshored; however, in practice, only 1.2 million jobs had been offshored[2] (Farrell et al. 2006). One reason for this number is that even though many students graduate from university in developing countries, not all qualify according to Western standards. Farrell et al. (2006) further argue that on average only 13 % of all graduates are qualified to work in a Western high-

[2] The calculations refer to the offshoring potential of the eight most relevant industries which are packaged software, IT services, retail banking, insurance, pharmaceuticals, automotive, healthcare, and retail.

added-value service firm. In contrast, 80 % of Western graduates qualify to work in multinationals (p. 26). Hence, developing nations are shrinking the educational gap solely with respect to the number of graduates, and not necessarily the quality.

13.2.3 Influence of National Culture

It is important to remember that international trade, of which service offshoring is but one dimension, is not merely an economic activity. There are social and cultural aspects that determine the course of success. Social norms and cultural climate affect not only the quantum, but also the quality of international relations (Kamal et al. 2004). Hence, arising cultural differences may prove to be a challenging and even hindering factor in offshoring services to otherwise potentially attractive locations. We utilize Hofstede's cultural research to examine the influence of national culture. Hofstede developed five independent cultural dimensions that define and shape behavior. These are (1) power distance, (2) individualism versus collectivism, (3) masculinity, (4) uncertainty avoidance, and (5) long- versus short-term orientation (Mead 2005, p. 39). In the following, these dimensions are elaborated and furthermore evaluated relative to Germany.

The first dimension, *power distance*, is measured with the power distance index (PDI) and analyzes how employees respond to the inequality of their workplace. Each organization has a hierarchy, be it flat or steep; social status is derived from each distinct level of power. A low PDI results in the employees' willingness to actively participate in the decision-making process and, moreover, to disagree with superiors. If, however, the power distance is great, employees are likely to accept their tasks without reflection. Hierarchies are more respected, and an autocratic leadership style is preferred (Binder 2007). The second dimension is called *individualism versus collectivism* (IDV) and refers to relationships among individuals in a group. Individualists prefer personal praise and independent work tasks to prove their competence. Collectivistic cultures (a low IDV), on the other hand, appreciate group tasks and decisions. They do not want to be exposed individually, and personal identity is defined by the group (Binder 2007). The third dimension *masculinity* (MAS) addresses the degree of gender differentiation in the respective country. Men are associated with attributes such as power, control, or ambition, while females are connected solely with modesty and quality of life. Roles may be clearly defined, such as that men reach senior management position whereas women are expected to bring up children (Mead 2005). In low masculinity cultures, both genders are valued equally and both may reach a senior management position. Achievement is measured based on human contact and, consequently, relationships matter (Binder 2007). *Uncertainty avoidance* (UAI) reflects the resistance to change and the willingness to take risks. Especially in setting up new business operations, as in the case of offshoring service projects, the level of risk is expected to be high. Accordingly, this dimension bears an impact comparable to

the others. Employees whose uncertainty avoidance is high appreciate working with strict rules and control systems, including instruments that reduce the level of risk (Binder 2007). Finally, the fifth dimension is *long- versus short-term orientation* (LTO). Long-term-oriented cultures are labeled 'Confucian,' owing to the values attributed to the teachings of Confucius. Business relationships are ordered by status, and entrepreneurial activity is fostered according to this order. In contrast, short-term-oriented cultures are characterized by personal stability as exemplified by the protection of 'face' and the veneration of tradition. Here, immediate results are valued (Binder 2007).

In his research, Hofstede concluded that Germans have a low power distance result at 35 out of 100. Germans tend also to be individualists, scoring 67 out of 100, while demonstrating a rather high degree of masculinity at 66 out of 100. In addition, their uncertainty avoidance comes in high at 65 out of 100. In the fifth dimension, long- versus short-term orientation, Germans are found to have a short-term focus, scoring 31 out of 100 (Hofstede 2010).

13.2.3.1 Infrastructure and Legal Aspects

Even though sufficiently talented low-wage employees are available, they are becoming more decentralized. Local infrastructure requisites for a qualifying offshore location include sound telecommunication and IT networks, as measured by the speed of connection and degree of connectivity. In addition, availability and quality of real estate, the power supply, and transportation connection are important aspects (Kotlarsky et al. 2009). Among the infrastructural considerations, the most essential to the success of a service offshoring project is the telecommunication infrastructure. Moreover, the continuity of electrical power supply is an issue (Vashistha and Vashistha 2006). Owing to the importance of infrastructure, government officials in potential offshoring locations have laid substantial investment plans and made it a core strategic priority (Business Monitor International 2010). The Business Monitor International (2010) has also concluded that among all construction investments within the core emerging markets,[3] 45 % are allocated to building or improving infrastructure (p. 10). In order to assess the current strength and quality of the infrastructure, one needs to calculate an infrastructure-to-construction ratio. According to this calculation, China appears rather weak with a ratio of 40 %, especially compared to other potential offshoring countries such as Mexico (62 %), Brazil (55 %), Nigeria (55 %), Russia (53 %), and India (51 %) (Business Monitor International 2010, p. 12).

[3] According to Business Monitor International core emerging markets include Mexico, South Korea, Turkey, Vietnam, Poland, Hungary, South Africa, Nigeria, Russia, China, India, Brazil, and Indonesia.

13.2.4 Political Risk

In addition to the specific service offshoring location decision factors elaborated in the four previous subchapters, one should discuss one additional, conclusive offshoring decision factor in the analysis: political risk. This factor addresses the likelihood that a government will change their laws or regulations pertaining to business and commerce, including adherence to those of the World Trade Organization (WTO) or those protecting patents. Moreover, a government's effectiveness, the efficiency of its court system, and the enforcement of contracts are evaluated herein (Feinberg and Gupta 2009). The purpose being to quantify the risk of asset depreciation due to government-imposed impediments or even potential expropriation of the firm's investments (Feinberg and Gupta 2009). Consequently, offshoring firms need to first assess the respective country risk and then develop coping measures accordingly.

13.3 Data and Methods

13.3.1 Data Envelopment Analysis

We used data envelopment analysis (DEA) to compute the proposed comparative efficiency analysis (Cooper et al. 2007). A typical statistical approach would be to evaluate entities according to an average, that is, through a regression analysis and thereby conduct the individual performance of the research data. In order to measure the efficiency of a given data sample, however, it may be more useful to compare the entities with one other. Thus, the point of reference should not be a theoretical average, but the best possible market performer within the set of data. DEA is a good choice for this specific kind of research with a comparative efficiency analysis (Cooper et al. 2007). DEA constructs a practice frontier from the data in the research sample and moreover calculates the distance between the various samples, enabling a data comparison. The individual entities of the data set are labeled as decision-making units (DMUs). In our study, the DMUs are the respective countries; for instance, DMU 1 is Argentina and DMU 2 Austria. Overall, 27 DMUs are analyzed.

13.3.2 Research Models

We designed four separate models. Each of these models has the same DMUs which are 27 globally distributed countries. In addition, all models assume the same input factors. Five input factors have been selected based upon the literature review: (1) wages, (2) education, (3) cultural distance, (4) infrastructure, and (5)

corruption. Notwithstanding the same input factors, the output measures are different. Model A measures the amount of offshoring activities within the respective host country initiated by German service firms, while Model B captures the value creation of service activities within the host country. Value creation is measured by the quantity of service exports from the host country to the world, incorporating both the measure of commercial as well as computer and communication service exports. The latter is, in fact, a subset of the commercial service exports. Model B combines both service export measures as the output, while Model C and Model D consider the commercial and the computer and communication service exports individually.

13.3.2.1 Input Measures

The initial factor identified was cost reduction through lower wages in host countries. In order to identify a country's wage level, we utilized wage data research conducted by UBS in 2008, which reflects wage data from the previous 3 years. This particular data set was chosen because it indicates gross wages that are the actual expenses for offshoring firms. Net wage data would only deliver vital information for the employee, not for the employer (Bunyaratavej et al. 2008). Service offshoring firms are interested in the wage levels at potential offshoring sites and not in the country average. Therefore, wage information based on research of major cities reflects actual expenses more accurately. UBS typically collected the gross wage data of one major city per country. Also, the presented wage data are based on a basket with a scope of 14 professions (UBS 2009).

As concluded by prior research, the quality of local education is a significant factor in the increased demand for services. The number of pupils enrolled in secondary education was considered in order to proxy this information, revealing the number of educated potential employees to join the workforce in subsequent years (Bunyaratavej et al. 2008). Thus, it is concluded that the more pupils enrolled in secondary education, the greater the educated workforce in the respective host country. In order to retrieve these data, we used the United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics database. Data included the total enrollment in private as well as public secondary education for the year 2007 (UNESCO 2010).

The third input factor was the cultural distance between the home country (Germany) and the host country. As earlier presented, the difference in Hofstede dimensions may lead to increased challenges in doing business in a foreign country. The closer a host country is to the home country, in terms of culture, the less likely it is that there will be cultural conflicts. Gupta and Raval (1999) even propose that cultural conflicts have the potential to 'make or break an offshoring project' (p. 24). Cultural distance, as the third input factor, was therefore the absolute mean difference in Hofstede's dimensions for Germany and the prospective host country. A cultural distance index (CDI) was calculated. Specifically, the CDI was calculated as follows:

$$\text{CDI} = \frac{1}{K}\sum_{k=1}^{K}\left|H_k^{\text{Host}} - H_k^{\text{Home}}\right|$$

where H represents the cultural score on the respective dimension whereas k indexes the dimension itself. K is the sum of all dimensions, thus K equals 4 or 5 depending on the availability of the LTO score of the respective host country. A decrease in CDI score implies cultural similarity, whereas an increase indicates greater cultural distance (Bunyaratavej et al. 2008).

The fourth input factor was infrastructure. Advanced telecommunication networks and IT infrastructure are necessary preconditions for a host country to qualify as an offshoring site, especially in the case of a service offshoring project (Rao 2004). Since the host country's government is the institution responsible for establishing such a qualifying infrastructure, the World Development Indicator, labeled as *information and communication technology expenditure*, was considered a quantifiable measure. The indicator includes spending on computer software and hardware, communication services, as well as wireless communication equipment. The 2007 data were presented in US dollar value[4] (World Bank I 2010a).

The fifth input factor aimed to capture the political environment, particularly corruption. The lower the political risk, the more attractive the location due to the fact that the offshoring firm's operations are not diminished. The less corruption that exists, the more attractive the location is. In measuring the degree of corruption as an input factor for the following DEA, we used the analysis of the *Corruption Perception Index* (CPI) computed by Transparency International for the year 2007 (Transparency International 2010). This index measures the perceived level of public-sector corruption around the world based on thirteen different business and expert surveys. Countries were ranked on a scale of 0 to 10, with 0 being perceived highly corrupt and 10 as having low levels of corruption.

13.3.2.2 Output Measures

As presented above, the following DEA consisted of four models, namely Models A, B, C, and D, each of which incorporated different output measures.

Model A measures the quantity of offshoring investments to a specific country from Germany. This appears to be a valid measurement of a location's attractiveness for two main reasons. First, companies tend to follow one another to offshoring locations based on a location's track record (Farrell et al. 2006). Also, learning opportunities from previously offshored firms can be utilized to reduce potential challenges. Second, a country's ability to attract firms proves it is an attractive location. The greater its investment in an offshoring location, the more

[4] The exchange rate of the 8th of June 2010 has been utilized to convert the figures to euros (0, 8384 USD/EUR).

attractive the country becomes (Bunyaratavej et al. 2008). To capture German investments within the various offshoring locations, we used the *Eurostat* database compiled by the European Commission (2010). German direct foreign-service investments from the year 2007 were considered. Nevertheless, the service FDI may measure solely the activities within a location, inferring attractive locations from that; it may not, however, indicate whether a location is actually able to create value. Therefore, we felt the need to develop a second measure that captures value creation.

Model B incorporates two output factors, which both have an export orientation. The underlying premise for the two output factors is that a firm's overall offshoring objective is to complete a value-added service. Thus, it is a question of whether a location is able to create value with its services. The higher the probability that a location's environment is able to lead to value creation, the more attractive the location will be from a service offshoring firm perspective (Bunyaratavej et al. 2008). The quantity of service exports were used to assess service value creation in various countries. The first indication of output is *commercial service exports,* which the World Bank measures for its assessments. This indicator captures total service exports minus government services while defining services as the economic output of intangible commodities that may be produced, transferred, and consumed at the same time (World Bank II 2010b). The second output measure of Model B follows the same line of reasoning as the first. However, since the term 'commercial service exports' is rather broad, the second measure captures solely *computer, communication, and other service exports*. By this measure, the validity of Model B grows as nations like Germany increasingly offshore these services. As computer and communication service exports are a subset of commercial service exports, Model B counts computer and communication service exports doubly, thereby endowing them with additional importance (Bunyaratavej et al. 2008). Data for 2007 computer and service exports are employed and listed as a percentage of the World Bank indicator of commercial service exports[5] (World Bank II 2010b). Models C and D assess the two service value creation measures individually, with Model C exploring commercial service exports and Model D computer, communication, and other service exports.

13.4 Findings from DEA

The four models were run using all five input factors. In considering Model A, the three countries attain the maximum (100 %) score were the Netherlands, the United Kingdom (UK), and the US. Model B concluded that Belgium, Hong Kong,

[5] Commercial service exports as well as computer, communications, and other service exports are initiated by the World Bank in US dollars. For the use of the following DEA, these values are converted to euros using the exchange rate of the 8th of June 2010 (0, 8384 USD/EUR).

India, Sweden, and Switzerland are also 100 % efficient. Model C adds Denmark with 100 % efficiency. Model D does not add any other 100 % efficient locations. Table 13.1[6] below provides the efficiency scores for all countries and all models. The efficiency scores of Norway and Denmark cannot be provided, due to the lack of data available.

In regarding Models A to D, respectively, we propose that the higher the efficiency score, the more attractive the investment in that specific offshoring location. Thus, the question arises of whether the two variables, the respective efficiency score of Models A to D from Table 13.1 above and the respective outputs, positively correlate German service FDI investment and service exports. This additional analysis enables us to confirm the robustness of the DEA findings, while validating actual location attractiveness. The expectation of positive correlation implies that the computed efficiency score is in accordance with the attractiveness of the location. In order to test this proposition, the Pearson correlation coefficient r is utilized. General guidelines for the interpretation of the resulting magnitude are as follows: small correlation with $|r| = 0.20 - 0.29$, medium with $|r| = 0.30 - 0.49$, and large with $|r| = 0.50 - 1.00$ (Cunningham et al. 2010). In calculating the Pearson correlation coefficient, the program SPSS Statistics 17.0 is utilized.

The input factors for the calculation are the efficiency scores and the respective considered output variable. Computing the first correlation for Model A, a large correlation results with a Pearson correlation coefficient of 0.908 (with an alpha of 0.01) corroborating the prediction: A higher location efficiency leads to higher service FDI investments from Germany in the respective location. The second correlation with Model B also leads to a large Pearson correlation of 0.517 (with an alpha of 0.01). It may be concluded that the higher location efficiency also leads to greater service value creation, increasing the location's attractiveness. Models C and D, which analyze Model B in more detail by considering the two output factors individually, are thus also expected to support the prediction. Model C yields 0.486, with an alpha of 0.05, while Model D concludes 0.572 with an alpha of 0.01. Both correlation coefficients demonstrate a strong relationship between a location's efficiency and value creation through service activities and hence support our prediction.

In order to identify latent structures and create a typology within the given data set of 27 countries, a *k*-means cluster analysis is performed at this point. The scores of Models C and D are neglected at this point due to the fact that they explore Model B in detail and do not incorporate new data. For the given data set, five clusters have been identified with significant mean differences, as shown

[6] All four models ranging from A to D utilized exactly the same five input factors, namely hourly wage costs, infrastructure investments, secondary education enrollment, cultural distance, and corruption perception. For the output measure Model A applies service FDI investment in the respective host country, Model B utilizes commercial service exports as well as information and communication service exports, while Model C and D consider these two exports measures, respectively, on their own.

Table 13.1 DEA results

Country	Model A	Model B	Model C	Model D
Argentina	0.019	0.255	0.253	0.249
Australia	0.081	0.432	0.432	0.222
Austria	0.499	0.917	0.917	0.758
Belgium	0.292	1.000	1.000	1.000
Brazil	0.071	0.220	0.198	0.220
Canada	0.067	0.428	0.401	0.428
China	0.306	0.961	0.961	0.655
Czech Republic	0.141	0.408	0.408	0.283
France	0.366	0.594	0.594	0.486
Hong Kong	0.096	1.000	1.000	1.000
India	0.171	1.000	1.000	1.000
Italy	0.268	0.603	0.603	0.544
Japan	0.030	0.487	0.407	0.487
Mexico	0.089	0.412	0.412	0.039
The Netherlands	1.000	1.000	0.907	1.000
Poland	0.293	0.450	0.450	0.381
Portugal	0.070	0.385	0.385	0.291
Russia	0.244	0.397	0.397	0.361
South Africa	0.039	0.243	0.243	0.081
Spain	0.175	0.900	0.900	0.657
Sweden	0.218	1.000	0.934	1.000
Switzerland	0.722	1.000	1.000	1.000
Turkey	0.066	0.412	0.412	0.104
UK	1.000	1.000	1.000	1.000
US	1.000	1.000	1.000	1.000

below. The means are given as cluster center (CC). The CCs represent the mean efficiency of the countries within the respective cluster ID and range from 0.9653, for the most efficient Cluster 1, to 0.2271 for the least efficient Cluster 5 (Table 13.2).

Cluster 1 includes those countries that are highly efficient with respect to both output measures and the amount of service investment, as well as the value creation through these services. It may, furthermore, be noted that only developed, Western nations are included. Worth noting is the Netherlands score, valued to be 90 % efficient with respect to service exports overall from Model C; however, according to Model D which considers solely information and computer service exports, it is 100 % efficient. Hence, the Netherlands is especially efficient at creating value with these particular services. The second cluster countries tend to be highly efficient in terms of their service exports, each above 90 %. Austria, with an efficiency of 76 %, is far less efficient when information and computer service exports are considered individually. However, Cluster 2 service FDI investments are less efficient with scores ranging from 50 to about 30 %. The majority of the member countries of this cluster are again European nations, with the exception of

Table 13.2 Aggregated k-means cluster analysis

Cluster ID				
1 CC = 0.9653	2 CC = 0.6625	3 CC = 0.57	4 CC = 0.429	5 CC = 2271
The Netherlands	Austria	Hong Kong	France	Argentina
Switzerland	Belgium	India	Italy	Australia
UK	China	Spain	Poland	Brazil
US		Sweden		Canada
				Czech Republic
				Japan
				Mexico
				Portugal
				Russia
				South Africa
				Turkey

China. The third cluster is also highly competitive in terms of service exports efficiency. All countries achieved a 100 % efficiency score, except Spain (90 %). Spain, with only 66 % efficiency, also falls behind considerably in information service exports. Furthermore, all countries lack in attracting a high level of service FDI. The best performing country, with respect to this measure, is Sweden with 22 % efficiency; the others are lagging far behind. These countries face the same challenges as do those from the second cluster, namely in converting their service value creation into investments from Germany. The fourth cluster countries have a medium score on service exports and a medium score on attracting German service FDI investments. The fifth cluster countries have a low efficiency score in both the service FDI investments and the service exports dimensions. Fifth cluster members are South American countries (Argentina and Brazil), developed economies (Portugal and Japan), and the developing nations of South Africa, the Czech Republic, and Russia.

A next step is to investigate the source of overall efficiency. This analysis is of great importance for two reasons. First, firms become aware of the individual location strength and, thus, may weight the criteria according to their respective main objective. By simply considering the overall DEA above, individual aspects cannot be extracted. The second objective of this input analysis is to create awareness for countries' governments. Knowing the individual efficiency, the opportunity arises to increase it, using certain macroeconomic measures.

13.4.1 Input-Specific DEA

Our second prediction was that the higher the individual input efficiency of a country, the more attractive the offshoring investment becomes, solely on the basis of this specific input. In order to test this, five Pearson correlation coefficients were

calculated, one for each input factor. We utilized the service export of Model B as the output correlation measure.

First, wages were tested. A positive relationship is expected between the wage efficiency and amount of service exports, implying that the higher the wage efficiency of a location, the higher the number of service exports, which increase the location's attractiveness. A correlation of 0.394 with an alpha of 0.05 results, which represents a positive, medium correlation; thus, our second prediction was also supported. The cultural distance and the CPI also propose a positive correlation, implying that the more efficient the cultural distance and political environment, the higher a location's attractiveness. The Pearson correlation is 0.906 for CDI and 0.810 for CPI, both with an alpha of 0.01. For both parameters, a strong positive correlation may be concluded. For the next factor—the quantity of education enrollment—an r of 0.055 results. A positive yet small correlation is supposed to exist. However, to derive this correlation, an alpha of 0.789 is utilized, which is above the maximum acceptance level of 0.05; therefore, our second prediction is not supported for the education input factor. A similar result yields the infrastructure investments input factor; which also requires a positive correlation to reinforce the proposition. Yet an r of negative 0.032 is yielded with an alpha of 0.875 which is far above the assumable alpha of 0.05. Consequently, the infrastructure input factor does not corroborate our second prediction. On the whole, we find support for three out of five parameters; for the remaining two; no correlation was found.

Table 13.3[7] depicts the five individual input measures ranging from wages to corruption perception index. Accordingly, five CCR DEAs were conducted with respect to individual input measures, utilizing the service export volume measure from Model B as the output variable. For instance, the scores in the first column labeled as *wage* are calculated by considering the wage data (UBS 2009) as the input variable and the *commercial service export* volume as well as the *computer, communication, and other service exports* (World Bank II 2010b) as the output measure, *ceteris paribus*. As an example, Argentina is 4.6 % efficient with respect to the input factor wages, all other inputs being equal. The ideal offshoring location would be a combination of the 100 % scores on the individual efficiencies, namely wage efficiency from India, infrastructure and education efficiency from Hong Kong, CDI efficiency from the US, and CPI efficiency from the UK.

[7] Wage efficiency scores are conducted by utilizing wage data issued by UBS (UBS 2009, p. 26). Infrastructure scores are calculated by conducting information and communication expenditures issued by the World Bank. (World Bank I 2010a) For education efficiency, the number of pupils enrolled in secondary education is applied issued by UNESCO (UNESCO 2010) while cultural distance efficiency scores are based on Hofstede's cultural dimensions research. (Hofstede 2010) Political environment efficiency scores are calculated by using the corruption perception index computed by Transparency International (Transparency International 2010).

Table 13.3 Input-specific DEA

Country	Wage	Infrastructure	Education	CDI	CPI
Argentina	0.046	0.188	0.019	0.018	0.008
Australia	0.039	0.191	0.096	0.099	0.162
Austria	0.052	0.571	0.417	0.091	0.161
Belgium	0.061	0.857	0.655	0.086	0.149
Brazil	0.064	0.103	0.008	0.025	0.024
Canada	0.068	0.197	0.184	0.112	0.299
China	0.613	0.141	0.008	0.068	0.104
Czech Republic	0.047	0.271	0.109	0.032	0.020
France	0.150	0.242	0.151	0.169	0.315
Hong Kong	0.175	1.000	1.000	0.052	0.284
India	1.000	0.804	0.010	0.122	0.118
Italy	0.152	0.251	0.157	0.267	0.131
Japan	0.119	0.138	0.146	0.118	0.348
Mexico	0.152	0.085	0.010	0.016	0.015
The Netherlands	0.083	0.606	0.572	0.140	0.661
Norway	0.030	0.629	0.595	0.051	0.177
Poland	0.093	0.270	0.054	0.038	0.028
Portugal	0.036	0.385	0.205	0.015	0.038
Russia	0.102	0.198	0.024	0.031	0.029
South Africa	0.037	0.116	0.017	0.035	0.016
Spain	0.160	0.417	0.249	0.140	0.220
Sweden	0.059	0.855	0.777	0.087	0.676
Switzerland	0.038	0.449	0.654	0.454	0.366
Turkey	0.089	0.253	0.025	0.025	0.027
UK	0.282	0.451	0.377	0.555	1.000
US	0.376	0.130	0.139	1.000	0.981

13.4.1.1 Efficiency Sources of Cluster 1 Countries

Switzerland is the third most efficient country with respect to cultural difference, at 45 % efficiency. Owing to its closeness in culture, there is great service offshoring. One of the main CDI reducing factors in the case of Switzerland is the fact that Germany and Switzerland share the same language. Since services may involve close customer contact, language is a highly valuable factor and provides opportunities other non-German-speaking countries do not have. Besides, Switzerland has a 65 % efficiency score in education. In terms of absolute numbers, approximately 600,000 pupils are enrolled in secondary education which is, in considering the 27 countries, the fourth lowest quantity. However, due to the huge number of service exports, Switzerland is highly efficient with its small labor pool. It may further be inferred that the dearth of educated employees creates intense competition, leading to higher wage costs. Switzerland is only 4 % efficient in considering wages. In absolute terms, Switzerland is the second most expensive country in the data sample with average hourly costs of 23 Euros. Moreover, Switzerland,

with a score of 37 %, has the lowest CPI efficiency in Cluster 1. On the whole, Switzerland is especially competitive in regard to education and cultural distance.

In addition, the UK is included in Cluster 1 with an overall efficiency of 100 % in Models A, B, C, and D. Generally speaking, the UK may be categorized, along with the US or Switzerland, as a high-cost country. However, owing to its overall highly efficient business environment, service exports of 240 billion Euros lead to a wage efficiency of 28 %. By contrast, the US, despite having a larger economy, has only twice the number of exports of the UK. Education in the UK, at 38 %, may be valued as 'medium efficient.' Moreover, the UK receives the highest CPI score of 100 %, followed by the US with 98 %. The other input variables score above average, yet do not attain 100 %. On the whole, the UK is particularly strong in regard to its political environment and, thus, qualifies for those service firms concerned with data protection and an overall need of efficient factors.

The US, with a score of 98 %, turns out to be 100 % efficient on CDI and also highly efficient for CPI. Germany and the US score nearly equal on power distance, masculinity, as well as long-term orientation. Therefore, the same leadership styles or motivation techniques may be applied within internal operation, which reduces the effort required in developing operations. Also, despite the different languages, no cultural conflicts can be expected. Although the absolute CPI score is below that of Sweden and the Netherlands, which are the highest in the data set, the US qualifies as a stable political environment. This conclusion is supported by the tremendous amount of service FDI leading to nearly 100 % efficiency. Wage costs are the second most expensive in Cluster 1 and the third most expensive overall after Switzerland and Denmark. Yet, wage efficiency is the highest in Cluster 1, with 35 % efficiency. Thus, labor is expensive, but efficient. Furthermore, the US has the highest incidence of secondary school enrollment after China and India. However, measured in reference to the amount of service exports as the value indicator, the US is only 14 % efficient; the weakest country in Cluster 1 with respect to education. The last input variable, the infrastructure investment, is 13 % efficient; although in absolute terms, the investments are far above the other countries. To sum up, the close culture and stable political environment turn out to be costly. The other input variables appear to be weak, owing to the relatively low amount of service exports.

The Netherlands is the last country of Cluster 1, with an overall efficiency of 100 % in Models A, B, and D, and 91 % in Model C. The main efficiency sources are the infrastructure investments and political environment with single efficiency scores of 61 and 66 %, respectively. The cultural distance is the second greatest of Cluster 1 countries, leading to an efficiency of 14 %. The Netherlands is characterized as a feminine culture, while Germany is a highly masculine one which leads to different job designs as well as customer handling. The CPI, with an efficiency of 66 %, is the third highest score in the Cluster 1 countries. This is supported by two indications. First, the absolute CPI score is relatively high at 9 out of 10. Second, the political environment is appreciated and supported with substantial service FDI from Germany. In 2007, the Netherlands was the country with the highest German service FDI of 116 million Euros. Wage costs are sharply

above those of the UK, yet the efficiency is far lower at solely 8.6 %, as compared to the 28 % of the UK. This may be attributed to the three times fewer service exports compared to the UK. To conclude, the Netherlands is strong on each measurement except culture and wages.

13.4.1.2 Further Remarkable Aspects Revealed by the DEA

Clusters 2 and 3 incorporate two main offshoring locations, namely India and China. Considering the overall efficiency analysis, both are highly efficient according to Models B and C, China scoring 96 % while India scores 100. India also scores 100 % in Model D, while China lacks in communication and computer service exports leading to an efficiency of 65 %. In Model A, China scores only 31 %, while India scores 17 %. Both locations are particularly strong on wages. India is the cheapest location within the sample and owing to substantial service exports, reaches a wage efficiency of 100 %; thus, setting the benchmark for all other countries researched. The efficient frontier generated outperforms most other offshoring locations by a large degree, and most of the countries, therefore, appear to be highly inefficient—17 countries are below 15 % efficiency. Nonetheless, China turns out to be the second most efficient country with respect to wages with an efficiency score of 61 %. Putting this wage aspect in the context of education, it appears that China and India do not produce as many efficient workers as the Cluster 1 countries, discussed above. The education efficiency for both locations is approximately 1 %. This inefficiency may be best exemplified by calculating the per-educated worker output, given the service output applied within this research. In India, each potential educated employee generates an output of 895 Euros, in China 1,210 Euros. In contrast, Cluster 1 countries such as the US, the Netherlands, and Switzerland are able to attain an output per-educated worker of 17,598 Euros, 58,960 Euros, and 106,870 Euros, respectively.[8] Thus, it may be inferred that firms with extreme cost considerations may be attracted to China and India; however, cost savings are generated at the expense of quality. When discussing the role of China as a service offshoring location, additional attention has to be placed upon Hong Kong. Hong Kong, being a major Chinese city, is far more expensive than the average major Chinese offshoring location. Therefore, the wage efficiency decreases to only 17.5 %. However, higher wages may be justified by exploring the education efficiency which is 100 %. Hong Kong is able to generate the highest per-worker output within the research sample. Of additional disadvantage to China and India are their unstable political environments. Absolute CPI scores of 3.4 in China and 3.4 in India lead to an efficiency of 10.5 and 11.8 %, respectively. Despite the low scores, their efficiency may still be valued as moderate. Both locations have sufficient service exports and thereby enhanced their score. Other

[8] For the output per-educated employee calculations, the ratio of the *commercial service exports* (World Bank II 2010b) and *enrollment in secondary education* (UNESCO 2010) is utilized.

locations with a comparable CPI score such as Mexico with 3.4 reach an efficiency of only 1.5 % due to the fact that it lacks in creating value through exports and thereby fails to balance its rating. The last measure, infrastructure, appears to be one of the key advantages in India with an efficiency of over 80 %, which is the fourth highest rate overall. In contrast, China is 14 % efficient. Even though China invested five times as much as India with an absolute sum of 186 billion Euros, the resulting service exports are marginally higher than India's. Yet, in considering Hong Kong, the advantages of major hubs are demonstrated once again. Hong Kong reaches 100 % efficiency on infrastructure investments, due owing to the fact that 7 % of all investment in China was allocated to Hong Kong.

Another developing nation, Russia, shall be mentioned briefly. Russia is allocated to the least efficient Cluster 5 with an efficiency of 24 % in Model A and 40 % in the remaining models. Russia's main advantage is, as with India and China, wage and infrastructure efficiency. However, Russia is not able to reach as high as efficiency score, with 10 % for wages and 20 % for infrastructure. In absolute terms, the wages of Russia are still double those of China while the service exports are far below those of the other countries researched; Russia is ranked the location with the seventh lowest number of service exports. Considering the other measures, education efficiency is 2.4 %, which is above the score of India and China, yet still highly inefficient. In addition, the unstable political environment demonstrates great challenges for Russia. The absolute CPI score of 2.3 out of 10 is the worst score among the researched countries which leads to an efficiency of 2.9 %. On the whole, Russia does not demonstrate any location advantages, due to the fact that it is outperformed on every input measure.

Extant literature has extensively discussed the emerging role of EE for German firms seeking offshoring (Dalia 2006). However, this role has developed from multiple earlier manufacturing offshoring projects, in particular in the automotive sector (Hall and Hussey 2007). It is further argued, that more advanced service functions have already partially moved and will continue to move to these locations (Safar 2006). Thus, the question arises whether EE has already completed this transition process from manufacturing to services. As of 2007, EE still lags far behind with its service offshoring efficiency. EE, in this study represented by Poland and the Czech Republic, is included in Clusters 4 and 5. The main drawback of these two locations lies in their political environment, with an absolute CPI score of 5.2 in the Czech Republic and 4.2 in Poland, which leads to 2 and 2.8 %, in terms of efficiency. Poland, which is twice the size of the Czech Republic in terms of its gross domestic product (GDP) (UNESCO 2010), has nearly double the service exports of the Czech Republic; thereby creating a slightly higher efficiency. In terms of wages, EE is more efficient than most of the Cluster 2 countries, with an efficiency of 10 % in Poland and 5 % in the Czech Republic; nevertheless, it is not able to attain such a high-wage efficiency as other low-cost locations such as China and India. Education levels, the counterpoint to wages, do, however, appear far below those of Cluster 2. The same can be concluded for the cultural distance, which for both locations are below 4 % efficiency. It should be noted that Poland and the Czech Republic are very similar in regard to

their Hofstede dimension, and differ from Germany solely in their PDI and UAI scores (Hofstede 2010). These weak scores notwithstanding, infrastructure investments appreciate EE's efficiency score to 30 % efficient in both locations. Thus, it may be inferred that an infrastructural base is established upon which potential service offshoring firms may build in the future. Yet, other measures need to be taken to fully increase their attractiveness to service firms.

13.5 Conclusion

We conclude that the most efficient service offshoring countries for German firms are the Netherlands, Switzerland, the UK, and the US, with an average efficiency of 97 %. To identify the efficiency sources in a second instance, five additional DEAs were performed, considering each input factor individually. That the results show that, with respect to wages, India is 100 % efficient; considering education and infrastructure, Hong Kong is 100 % efficient; for cultural distance, the US is 100 %; and in considering corruption, the UK leads with an efficiency of 100 %. Furthermore, our research concluded that developing nations are more efficient with respect to wages as well as infrastructure. The developed nations, on the other hand, appear to have the competitive edge in education of their workforce and stable political environment. A positive correlation was proven to exist between a location's attractiveness and its efficiency score, implying that a higher efficiency leads to a higher attractiveness.

To conclude, this research made contributions on micro as well as macro level. To derive the best possible location choices, the identified efficiency scores have to be put in the context of functions. Therefore, the main offshoring functions have been discussed. For IT related services, education and wage considerations are dominant aspects. In considering a location's IT focus in addition to the aforementioned factors, Hong Kong and India prove to be the best possible offshore locations. In choosing between two countries, the determinants are efficiency and specialization. Hong Kong is both more expensive and less specialized in IT, but has highly efficient workers. Meanwhile, India is the cheaper location with high IT specialization, but its employees are not as efficient. The next industry analyzed is telecommunication. Here, wage considerations in combination with a stable political environment to ensure critical data protection are overriding considerations. The discussion concludes that India and the US are the most suitable locations. Moreover, the role of call centers has been explored. Here, the research has to be extended by cultural distance, due to intense customer interaction. Leading to the conclusion that nearshore locations with low wages are the most efficient. In this context, the UK and Italy turn to be highly efficient. EE may serve as a future high-potential location if firms are able to diminish negative cultural effects. As a final function, R&D is explored. Here, education efficiency and data protection are significant, pointing to UK, Hong Kong, and India locations. Again, higher wages in the UK are justified by a more efficient political environment.

At the macro level, we identify how likely governments are to increase their location's efficiency scores. The probability of the individual input factors has been discussed, and it may be concluded that since developing countries turn out to be more efficient in their wages and infrastructure, they are far more likely to increase their score with respect to these measures. Developed nations, on the other hand, have a competitive edge in their efficient workforce and stable political system and therefore may extend their score with regard to these factors.

We advance the findings by Bunyaratavej et al. (2008), which utilized the US as the home country, by comparing location efficiencies for Germany as the home country. We conclude that a general adaptation of efficiency scores is not possible. Even if overall efficiencies are found to be partially similar, the efficiency sources are still varied, which leads to different implications. Nevertheless, it appears that psychical proximity shapes the efficiency of locations. Most European countries were more efficient for Germany while those close to the US, such as Argentina or Canada turned out to be more efficient for US-based firms. Yet this finding may not be universally valid as demonstrated by results of EE. In any case, additional location efficiency research needs to consider the home countries individually in order to spot efficiencies.

One of the limitations of our study is that DEA examines a one-year snapshot. Hence, by updating the completed analysis on an annual basis, one can track the way nations shape their factors, thereby increasing their efficiency over time. This would also consider long-term developments, which are partially influenced by the input factors. Infrastructure investments, for instance, have a long-term focus, which still may not be considered in the respective one-year perspective. To further the practical relevance of the research, we suggest two additional aspects. Measurement of the political environment, or the corruption perception index, can be exchanged for a broader measure that focuses not only on corruption, but also on the whole political system.

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Chapter 14
The Exit Advantage: Overcoming Barriers to National Exit

Brent Burmester

Abstract When a firm is engaged in relocationary foreign direct investment (FDI) as part of an offshoring strategy, it offsets its investment in the host nation with a divestment outside it. FDI is viable only if a firm possesses an ownership advantage to counter barriers to national market entry, but if the offshoring firm needs to overcome barriers to national market *exit*, it must possess an unidentified advantage analogous to, yet distinct from, the ownership advantage. This study attempts to determine how national exit barriers impact on a firm's reported probability of undertaking RFDI, using an ordinal regression analysis of online survey data specifically collected for the purpose. Results suggest political and strategic exit barriers from the origin nation are significant inhibitors to offshoring. The implications of this finding are discussed.

14.1 Introduction

When the offshoring phenomenon erupted in the mid 1990s, public interest in job losses and capital flight was heightened, and questions were recurrently posed about appropriate policy responses. The volume of critical commentary on the phenomenon left business practitioners in no doubt that the international relocation of industrial activity has its detractors, some of them very determined and not without influence. However, the forces exerted in resistance to offshoring, and the extent to which offshoring is inhibited by barriers to national exit, remain largely unexplored by international business researchers.

B. Burmester (✉)
Department of Management and International Business, The University of Auckland Business School, Private Bag 92019, 1142 Auckland, New Zealand
e-mail: b.burmester@auckland.ac.nz

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This chapter acknowledges that firms engaged in relocating internalised production processes across national boundaries must be able to overcome both barriers to entry in the intended destination and barriers to exit in the nation of origin. In addition to collating what is known about barriers to offshoring stemming from origin exit, it discusses the findings of an original study of offshoring intent amongst internationally active SMEs, which suggests that firms engaged in successful relocations possess a hitherto unidentified capacity characterised as the *exit advantage*. While the study does not empirically address outsourcing as an offshoring mechanism, its findings are relevant to the firm's choice between international outsourcing and internalisation.

14.2 The Pain of Departure

A recent article describing an option-pricing model of offshoring gives an account of how the strategy might be delayed by fiscal policy in the firm's home country (de Mello-Sampayo et al. 2010). Its authors could identify no other published research examining how policies in the country of departure, or 'origin', as it is termed hereafter, affect the timing of outward FDI. It is likely that the paucity of research relating to origin conditions stems from the tendency to explore offshoring by internalisation in the theoretical context of expansionary foreign direct investment (EFDI). Through EFDI, firms grow by adding capacity offshore while retaining their operations at home. By contrast, FDI-based offshoring (henceforth simply 'offshoring') occurs when a firm exits an industry in one country and enters the same industry in another, and it cannot safely be reduced to EFDI minus retained home activities. Offshoring is as much about the firm's departure and reduction of scale in the origin as it is about arrival at a new destination and subsequent growth. To optimise the strategic deployment of offshoring, managers and academics must account for the interdependency between divestment from the origin and investment in the destination.

A keyword search of any major academic journal database reveals the connections between different disciplinary research themes and exposes neglect of pertinent issues. At the time of writing, Scopus, one such database, archives 741 articles concerned with 'offshoring'. The works referenced in those articles provide a solid indication of the subject areas authors are drawing on to inform their research. In the references of the relevant articles, there are seven appearances of the word 'entry' for every appearance of 'exit', and 'growth' features twelve times more often than 'closure' or 'downsize'. Finally, the incidences of 'investment' outnumber those of the words 'divestment', 'divestiture', or 'disinvestment' by a ratio of more than 40:1.

The disproportionate academic interest in the 'offshore' of offshoring can be traced back to a preoccupation with the phenomenon of growth in international business research (*cf* Bevan and Estrin 2004). The study of FDI, and strategies contingent upon it, was founded on the seminal works of Edith Penrose (1959),

Stephen Hymer (1976), and John Dunning (1958, 1977), within the tradition of theorising on the growth of the firm (Kobrin 2001). Although a minor strand of research deals with de-internationalisation, retrenchment, and exit, particularly in the form of foreign direct divestment (FDD) (*cf* Benito and Welsh 1997), 'international business' usually implies 'more business'. Nevertheless, while relocating activities to a national host can result in an increase in the firm's productivity or market share, it can *also* imply consolidations, cut backs, closures and reduced capacity (Chan et al. 1995). These negative incidents of offshoring are the consequence of national market exit through divestment, and although focussing on the positive incidents of the strategy is understandable, it may, paradoxically, lessen the chances of realising desirable results.

14.3 The Symmetry of Entry and Exit

It is conventional in international business to assume that firms entering a foreign national environment via FDI possess proprietary assets, such as trademarks or patents, and/or transaction advantages, which result from how the firm organises the exchange of goods and services in internal hierarchies and in the market (Dunning 2000). These are termed *ownership* advantages, as they are exclusive to the firm. Taken together with the location advantage, specific to the investment destination, and the internalisation advantage, entailing the superiority of foreign production ownership over international outsourcing, we have a standard model of the antecedent conditions for any internationalisation strategy based on FDI (Dunning 1980, 1988, 2000).

The expectation that firms engaged in FDI possess something special, or, to use the language of the resource-based view of the firm, something rare, inimitable, valuable and non-substitutable (Wernerfelt 1984), stems from the expectation that the destination is inhospitable to foreign newcomers. To an industry incumbent in the origin, the most important barriers consist of "liabilities of foreignness", costs faced by a new entrant when obtaining and assimilating information about the destination's economy, political and legal system, culture, language and so on (Mezias 2002). These barriers constitute the greatest inhibitors to engaging in EFDI, and they can only be surmounted when the foreign entrant brings with it unique competitive advantages.

Divestment, which is intrinsic to offshoring, is viewed in international business as a response to failure in the conditions needed for FDI. Thus, Boddewyn (1983) concluded international divestment occurs when any of the conditions promote FDI, that is: (1) loss of competitive (ownership) advantage *vis-à-vis* local firms; (2) political or economic changes in the host ending the location advantage; (3) other shifts in transaction costs rendering alternative operating modes preferable to internalisation. Loss of the ownership advantage would cause the MNC to not merely exit a particular production location, but the relevant line of business altogether. If the internalisation advantage no longer holds, a firm should terminate

its controlling interest in a source of supply, that is, ownership gives way to external outsourcing. Clearly, a lost location advantage stimulates an offshoring response, where divestment and FDI are integrated in a single reconfiguration.

In order to invest, the offshoring firm relies on its retained ownership advantage to overcome destination-entry barriers. To complete the divestment phase of offshoring, the firm must also surmount barriers to exit from the nation of origin, but in this regard the ownership advantage plays no obvious role. Indeed, it is not unreasonable to posit that the ability to surmount national exit barriers should be construed as a firm-specific advantage analogous to the ownership advantage, an advantage not formerly recognised in theoretical treatments of internationalisation by FDI.

A more recent contribution to FDI theory reinforces the conclusion that entry processes have exit analogues that demand particular attention. Whereas the eclectic paradigm explains FDI in terms of configuring current assets to exploit a known array of internationally distributed costs and revenues, the real-options approach seeks to understand FDI as a response to uncertainty regarding how those costs and revenues might change (*cf* Li and Rugman 2007). FDI demands a high commitment of capital that is very expensive to reverse should changes in transaction costs favour a lower commitment mode of market servicing, or production costs in the destination rise beyond those of other locations for a sustained period. This irreversibility means that offshoring decisions are not automatically reversed when the primary cause of those decisions is eliminated (Baldwin 1988).

Dixit (1989) shows that, under uncertain conditions, the decision to invest is taken in expectation of a significant super-normal profit, not merely a mathematical improvement on the alternative use to which the capital is being put. Just as importantly, however, the decision to *divest*, which is itself effectively irreversible, is taken when profit is significantly sub-normal. Thus, offshoring should then occur only when a substantial gap opens between the actual performance of activities in the origin and the expected performance of those in the destination. Thus, for a given level of uncertainty specific to the destination, increasing uncertainty in the origin will coincide with a greater propensity to delay offshoring, leading to a reduction in its likelihood in any given period.

The impact of uncertainty relating to conditions in the *origin* has attracted very little attention, but one study suggests volatility in origin-specific conditions is especially influential in offshoring. The study in question found uncertainty, measured as the ratio of a firm's fixed to total assets multiplied by a coefficient of sales variation, negatively correlated with propensity to engage in relocation (Pennings and Sleuwaegen 2000). The authors contended that this variable captured uncertainty with respect to conditions in the origin, therefore impacting primarily on the divestment aspect of the relocation decision. Thus, as uncertainty in the origin increases, the option to delay divestment increases, and offshoring is postponed. This points to the importance of conditions in the origin when seeking to explain why, how and when offshoring takes place. Real-options theory characterises uncertainty as a moderator between conditions and the likelihood of offshoring, such that uncertainty should weaken the positive association between

offshoring and an absolute decline in origin conditions. If origin uncertainty was considered an unfavourable condition *per se*, it would serve to augment the origin's location disadvantage, and the relationship between origin uncertainty and offshoring likelihood would be positive. In what follows, uncertainty regarding origin conditions, particularly barriers to origin exit, is not treated as an exit barrier in itself.

14.4 Barriers to Exit from the Origin

Before 'offshoring' had become a buzzword in international business, Dunning (1988) noted the unexplored role of barriers to exit in strategies involving international divestment. Now, as then, barriers to exit from a national market infrequently attract research attention. The bulk of exit barrier research is in the context of the industry or product-market, where barriers serve to delay industrial contraction, keeping incumbent numbers, or industry capacity, above a sustainable level. Industrial economists treat exit barriers as costs facing firms leaving a market and discern them when firms experience inadequate financial returns, but do not opt for divestment (Porter 1976; Nargundkar et al. 1996; Karakaya 2000).

In the context of offshoring, origin exit barriers may be characterised as factors causing a firm to retain control over activities in a nation suffering from a location *disadvantage*. A firm seeking to engage in offshoring must be capable of overcoming barriers to exit. If it cannot, it may still have the option of an expansionary mode of internationalisation, such as EFDI or international outsourcing, but these will represent second-best solutions under the prevailing conditions.

In summary, it is apparent that the likelihood that a firm undertakes offshoring is reduced by barriers to origin exit. Porter (1976) distinguished three varieties of exit barrier: structural/economic; corporate/strategic; and managerial. The relative inhibiting effect of these three, augmented by a fourth category of barrier labelled 'political', is discussed in more detail below.

14.4.1 Economic Exit Barriers

Most commonly cited as an industry exit barrier are specific assets, the value of which is significantly diminished when they are removed from the context of the selling firm's value-adding system. Asset-specificity alone should not deter offshoring, as the firm can redeploy specialised assets from the origin in the destination. However, if such assets are also immobile, they must be sold at a price that does not reflect their value to the firm. If the assets in question are specific to the industry, rather than the firm-itself, their market price will be depressed: the only potential buyers are competitors situated in the origin, and even were they prepared to pay a reasonable price to their rival, they are equally handicapped by their location in the origin when it comes to deploying the assets in question.

Sunk costs are also important economic exit barriers. Yoffie (1993) comments that although a firm's production locations and export platforms may no longer be the most economically efficient, it is economically rational to keep those operations in business for years or decades because of sunk costs. Rational or not (*cf* Holcomb and Evans 1987), Pennings and Sleuwaegen (2000) find sunk costs do not exhibit a significant deterrent influence on national exit in the course of relocating activities. In the light of these findings, the following hypothesis is derived:

Hypothesis 1: Economic origin exit barriers are a comparatively weak deterrent to offshoring.

14.4.2 Strategic Exit Barriers

Porter (1976) defines strategic barriers as a function of the degree of integration between the unit targeted for divestment and the rest of the business enterprise. 30 years ago, Hymer noted that a multidivisional structure enables a corporation to 'leave the market by dropping a division without disturbing the rest of the structure' (1971, 120). In a similar vein, Vernon (1966) acknowledged that offshoring may be slowed by the need to establish efficient communication between dispersed functional activities. Thus, the more tightly integrated a unit is with the firm's production system, the greater the disturbance caused to the structure as a whole.

A second strategic exit barrier, not recognised when Porter coined the term, is the combined weight of origin *entry* barriers. In industrial economics, industrial entry barriers are treated as exit barriers, because the cost of re-entering an industry in which a firm is incumbent, should it prove unsuccessful elsewhere, deters that firm from industry exit (Eaton and Lipsey 1980; Shapiro and Khemani 1987). In offshoring, barriers to origin entry constitute barriers to exit from the origin, because the firm is unsure of its ability to cope with the alien environment of the destination. Thus, Colombo and Delmastro (2000) find industry failure rates are lower where closures imply national market exit and conclude that this reflects the cost of market *re-entry*. It might be argued that barriers to origin re-entry should be low for a firm with experience of the origin, but the re-entrant may face costs that are a direct consequence of exit, not shared by other incumbents or new entrants. For example, having already abandoned the origin as an investment location, the firm may face an unwillingness to cooperate from disaffected government agencies, managerial and technical specialists employed by the firm prior to exit, unions, news media, and consumers. There may be problems re-establishing supply and distribution networks with businesses that lack confidence in the relocated firm's commitment to the origin market. In some cases, the competitive advantage of the firm may be impaired by virtue of having sold some or all of its assets to rivals still present in the origin when it initially exited. These longer term ramifications of the exit decision qualify origin entry barriers as strategic exit barriers.

Strategic exit barriers may play a particularly important role in offshoring, because the relocating firm is not severing the affected operations, but situating them in a new geopolitical setting. As a consequence, activities not undergoing relocation are likely to experience disturbance to a greater or lesser degree.

Hypothesis 2: Strategic origin exit barriers are a comparatively strong deterrent to offshoring.

14.4.3 Managerial Exit Barriers

Managerial exit barriers stem from firms' divestment decision processes. Managers may seek to protect their jobs or status, or preserve a business unit to which they have become personally attached, or may fight divestment for fear of being associated with failure (Gilmore 1973). Barriers also stem from the attachment of management to the origin itself and the depth of the relationship between the firm, its staff and the origin. Presumably, non-MNCs will be most strongly affected by these psychological barriers, as owners and management are likely to be origin nationals, and the firm's culture and organisational identity will be conditioned by that of the origin. However, it is also possible that MNC subsidiaries will be similarly affected if by these barriers if their tenure within the host has been long, leading to a condition of embeddedness.

As a consequence of these barriers, divestment has often been observed to follow 'management succession', the displacement of existing managers by new decision-makers unconstrained by personal affiliations or prior decisions of their own (Boddewyn 1979; Lindgren and Spandberg 1981; Tourneden 1975). It is not obvious that managerial barriers will play a very large role in offshoring, however. There may be disruption to managers' personal lives, and loyalty to the origin or local community may give managers cause to prevaricate, but since offshoring involves the firm switching locations while remaining in the same industry, the imprecation of failure rests on the origin itself, rather than the firm. The internationally relocating firm retains its ownership and internalisation advantages and seeks only to remedy the location disadvantage it experiences in the origin.

Hypothesis 3: Managerial origin exit barriers are a comparatively weak deterrent to offshoring.

14.4.4 Political Exit Barriers

The political costs of international relocation can also constitute a barrier to exit. Plant closure studies show closure decisions are often delayed by political and social pressure, and though distant MNC decision-makers may be less vulnerable

to local host country influences (Tsetsekos and Gombola 1992), the growing need for MNCs to maintain legitimacy at international, national and sub-national levels suggests these exit barriers exist for foreign direct investors also. When the relocating firm retains activities in the origin, or it expects to undertake another venture in that country in the near to medium term, it must factor in the costs to those activities of disaffecting stakeholders in its non-market environment.

The potential to undermine working relationships with non-market actors, such as governments, unions and local community groups, is predicted to be especially high in the case of divestment within an offshoring strategy, because of the offsetting investment in a foreign jurisdiction, which adds insult to injury. Muchielli and Saucier (1997) are alluding to this kind of barrier when they note that institutional constraints, such as union pressures, may have to be reduced before offshoring can take place. Both Porter (1976) and Boddewyn (1983) glance at the political environment in their coverage of the difficulties of divestment. While Porter notes the countervailing power of labour and, to a lesser extent, communities, Boddewyn observes that business enterprises are accountable, to a greater or lesser degree, to external pressure groups such as unions, governments, and employee representatives and that these groups require that such decisions should be justified.

While all four categories of exit barrier might inhibit the incidence of offshoring, political barriers arguably carry the greatest weight. Overcoming economic, structural or managerial barriers may be onerous, but political barriers introduce a stronger element of irreversibility to the offshoring decision and generate threats to assets remaining in the origin after relocation. As offshoring may be construed as a vote of no confidence in the origin, disaffected political stakeholders, such as governments and unions, may have a lasting impact on the firm's prospects should it which to retain business interests in that country or if it is concerned that it may need to reverse the production relocation, should all not go to plan.

Hypothesis 4: Political origin exit barriers are a comparatively strong deterrent to offshoring.

14.5 Empirical Support for the Exit Advantage

The author undertook to test the five hypotheses put forward in the previous section. Using data derived from an online survey of firms based in New Zealand, a study was undertaken to estimate the influence of perceived barriers to national exit on firms' reported likelihood of engaging in FDI. The surveyed companies were all currently engaged in some form of international business, whether through exporting or a higher commitment mode, in keeping with the expectation that offshoring is a reconfiguration method preferred by companies with international experience.

The likelihood of a firm engaging in offshoring within a given timeframe was treated as dependent upon six variables: the height of perceived origin exit barriers; the height of perceived destination-entry barriers; the attractant strength of a location advantage in the destination; the repellent strength of a location disadvantage in the origin; the size of the firm; and the degree of international experience of the firm.

The specification of a variable denoting the location disadvantage in the origin, or "push" condition, is in response to the "real-option" approach to the analysis of irreversible investment under uncertainty. This work suggests that it is not sufficient for a potential host country to exhibit marginally more favourable conditions than an existing location in order to induce FDI as part of an offshoring reconfiguration (Aizenman and Marion 2004; Dixit 1989). The possibility that location-specific conditions might change in the origin or the destination, or that the firm has misread environmental signals, could require the reversal of production relocation, at considerable cost to the firm. Therefore, the offshoring firm must be satisfied that the origin will not again yield performance levels comparable to those achievable elsewhere. That information is not contained exclusively in the economic performance of potential host countries, but also in the country in which production currently resides.

Email invitations to participate in the survey were delivered to 1805 companies, and 182 firms ultimately submitted a completed questionnaire quantifying a positive likelihood of undertaking FDI within 3 years. Of these, 50 reported an intention to engage in an act of *divestment* in the same industrial classification in the same three-year period. From this set of 50, small though it is, comes is the only data collected to date known to speaks directly to the way firms factor origin exit barriers into their offshoring decisions. The sample proved to be industrially diverse and consisted of relatively small, by international standards, locally owned and operated companies with substantial reliance on offshore markets, especially Australia.

14.5.1 Measures

Table 14.1 presents the variables incorporated in an ordinal regression model. The dependent variable, *L-Off*, is a four-category ordinal variable representing the respondent's estimated probability of undertaking FDI to a self-specified preferred destination between October 2006 and 2009. The data take the form of four discrete values ranging between 1 and 4, representing low probability of FDI (1), moderate probability of FDI (2), high probability of FDI (3), and very high probability of FDI (4).

Barriers to origin exit were measured using five-point scales to measure the perceived deterrent effect of fourteen different types of barrier identified in the literature pertaining to divestment and FDD. In the construction of this scale, there was relatively little prior research to rely upon, as exit barriers have been

overshadowed by entry barriers in empirical studies (Siegfried and Evans 1994). Most studies interested in identifying exit deterrents look for negative correlations between obstructive conditions and the likelihood of exit (Schnell 2006). The scales used in the questionnaire were inspired by Schnell (2006) and asked respondents to estimate the deterrent influence of each condition on divestment. It was then possible to aggregate deterrent ratings into measures of the height of combined political or economic barriers, for example, or an overall measure of origin exit barrier height. Table 14.2 shows the individual origin exit barriers items and their groupings into types.

To ensure consistency and commensurability, the height of destination-entry barriers was also measured by five-point scales, for fifteen distinct barriers to destination entry. The scores on the fifteen individual items were summed to form a measure of total perceived barriers to destination entry. Table 14.3 presents the individual items used to generate an aggregate score representing the height of destination-entry barriers.

Origin-push and destination-pull conditions were measured differently. Firms in the survey were asked to rate how conditions in New Zealand would impact on their competitiveness in the 3 years from the date of the survey. The lower the score on this scale, the higher the origin push, or location disadvantage. Rather than relying on a subjective indicator of the pull to the preferred destination, an objective measure of location advantage was based on the difference between the destination's 2006 and 2008 competitiveness scores (World Economic Forum 2006, 2008). This difference was expressed as a percentage of the 2006 score to construct an indicator of pull, or location advantage.

Table 14.1 Variables in regression model

Label	Description	Measurement
L-Off	Likelihood of engagement in offshoring between Oct 2006 and 2009	Four-category ordinal variable
Ex-P	Height of political barriers to origin exit	Sum of political exit barrier item scores
Ex-E	Height of economic barriers to origin exit	Sum of economic exit barrier item scores
Ex-M	Height of managerial barriers to origin exit	Sum of managerial exit barrier item scores
Ex-S	Height of strategic barriers to origin exit	Strategic exit barrier item score
EntB	Height of destination-entry barriers	Sum of destination entry barrier items scores
Push	Origin location disadvantage	Respondent rating of NZ conditions' impact on firm competitiveness, Oct 2006–2009
Pull	Destination location advantage	Destination's WEF competitiveness (2008 score–2006 score)/2006 score
Size	Size of firm	Total revenues for 2005
MNC	Multinationality of firm	Dummy = 1 when firm has FDI in main overseas market

Table 14.2 Barriers to origin exit included in survey

Economic barriers to exit	Cost of finding a buyer for divested operations
	Scale of investment in divested operations
	Physical immobility of divested operations
	Administrative costs of divestment
Managerial barriers to exit	Connotation of failure in divestment
	Disruption to manager's personal lives
	Loyalty to local community
Strategic barriers to exit	Disruption to the firm's non-divested activities
Political barriers to exit	Opposition to divestment from central government
	Opposition to divestment from local government
	Opposition to divestment from unions
	Impact of divestment on local community

Table 14.3 Surveyed destination-entry barriers

Restrictions on financial inflows and outflows
Import tariff levels
Immigration restrictions
Restrictions on foreign ownership
Required scale of the investment
Unfamiliar preferences of customers
Lack of access to channels
Threat of predatory pricing by competitors
Industry over-supply
Legal discrimination against foreign firms
Cultural dissimilarity to New Zealand
Public distrust of foreign-owned businesses
Future costs of terminating the investment
Cost of coordinating with other activities
Economic sanctions

Firm size and international experience are commonly added to the regression models of internationalisation decisions, as they are predicted to influence the level of resource commitment to international markets and the level of control assumed over foreign operations (*cf* Madhok 1998). Size is represented by total revenues reported for 2005. International experience is represented by a dummy variable taking the value of 1 if the firm serves one or more of its three most important foreign markets through FDI.

14.5.2 Results

Table 14.4 presents the regression results for an ordinal cauchit model incorporating the variables described above. Overall, the model performed moderately well.

Table 14.4 Results of ordinal regression

		Parameter estimates	
		Coefficients	Standard error
Threshold	[*L-Off* = 1.00]	−11.129***	3.917
	[*L-Off* = 2.00]	−9.790***	3.672
	[*L-Off* = 3.00]	−8.427**	3.420
Location	*Ex-P*	−0.573**	0.223
	Ex-E	0.040	0.178
	Ex-M	−0.118	0.225
	Ex-S	−0.607*	0.365
	EntB	−0.149**	0.062
	Push	1.054**	0.513
	Pull	0.227*	0.127
	Size	−0.031	0.028
	MNC	−2.462**	1.095
	Nagelkerke pseudo	0.426	
	-2 Log-likelihood	103.740***	
	Parallel lines	85.294	
	Number of observations	50	

* Significant at the 10 % level ** 5 % level *** 1 % level

The estimated parameter values imply that barriers to exit from the origin reduce the likelihood of FDI when it is associated with divestment in the same industrial classification. Hypotheses relating to the influence of different barriers are supported to a mixed degree. Political (H4) and strategic (H2) exit barriers show the expected strong deterrent impact on likelihood to engage in offshoring, but while managerial (H3) and economic barriers (H1) were expected to have less deterrent impact, it was not anticipated that they would fail to register as significant deterrents altogether. While managerial barriers have a negative coefficient, economic barriers have a slight positive coefficient, albeit insignificant. This finding proved invariant when other barriers were removed from the model, suggesting economic barriers are not obstructive when divestment is part of a relocation strategy.

As to the other variables in the model, the coefficients are broadly consistent with the predictions of the eclectic paradigm. Barriers to destination entry have a negative impact on the odds that a firm will report a high likelihood of offshoring, but the coefficient for entry barriers is markedly lower than that for political exit barriers and strategic exit barriers. This need not necessarily mean that entry barriers present a less substantial challenge than exit barriers for the offshoring firm. The offshoring decision may proceed in stages, with firms first examining the feasibility of origin exit, then destination entry, in which case entry barriers might factor less prominently for firms anticipating offshoring than for firms recovering from its implementation. An *ex-ante* preoccupation with origin exit might also

account for the difference between the coefficients of the location disadvantage in the origin and the location advantage in the destination, which are both positive as expected, but the influence of the push from the origin is stronger than that of the destination advantage. Also relevant in this regard are the different metrics used to estimate push and pull influences.

Of the two control variables, firm size proves to have almost no appreciable impact on the chances that a firm will report a high chance of offshoring. Contrarily, Pennings and Sleuwaegen (2000) report a significant positive relationship between size and propensity to relocate, best explained by the greater ability of large firms to absorb relocation costs. Their conclusion rests on the assumption that there are significant unavoidable fixed costs associated with relocation, while costs varying in proportion to firm size are relatively unimportant, although no evidence is adduced that this is the case. It is also possible that the conflicting result in the present study may be an artefact of the New Zealand sample, such that too few large firms are represented, or it may be that this relationship varies according to country of origin or the liberalisation of international markets. The second control, international experience, gives the same result as in Pennings and Sleuwaegen's study. Non-multinationals show far less likelihood of reporting a high probability of offshoring than their compatriots with experience of FDI.

14.6 The Challenge of Exit Barriers

If the influence of origin conditions were the same for FDI in offshoring or expansionary firm reconfiguration, the lack of discrimination between the two in the great majority of published studies would be of no consequence. On the contrary, the results of the present study suggest that offshoring is subject to a condition not discovered, nor, indeed, discoverable in research into EFDI. This result is provocative, and it should stimulate further empirical research into the significance of exit barriers in other settings, using larger samples, different measures and alternative methods. Only then will the effects of exit barriers on the FDI decision be firmly established.

To review, the anticipated significant and negative relationships between political and strategic exit barriers and the declared likelihood of offshoring imply that the orthodox specification of conditions antecedent to FDI is *not* sufficient where FDI facilitates international relocation. In offshoring, a further condition remains to be accounted for, in the form of the *exit advantage.* The exit advantage is attributed to the firm, like the ownership advantage, but is not defined with reference to other firms. Instead, the advantage must be maintained over non-market actors in the origin, primarily the government, who struggle with the MNC for control over its proprietary assets and the profits they generate.

14.6.1 Acquiring the Exit Advantage

For the MNC, anxious to guard the knowledge-based advantages that ensure its competitiveness, the imperative is to maintain mobility of its production capital. In order to ensure it internationally reconfigure itself with the least cost and delay, firms must closely attend to exit barriers in host countries, especially those arising in the political domain, in order to maintain their exit advantage.

For the globally competitive firm, anxious to guard the knowledge-based advantages that ensure its competitiveness, the imperative is to maintain mobility of its production capital. In order to ensure they can reconfigure with the least cost and delay, firms must closely attend to barriers in host countries, especially those arising in the political domain, in order to maintain an exit advantage over the origin. What constitutes an exit advantage? Clearly, much depends on the country from which the firm seeks to depart, the relevant industry, and the type of activities the firm seeks to relocate. Some general prescriptions can be derived from bargaining theory, where the relationship between MNC and its host is characterised as an exchange of commitments. The literature emphasises the proclivity of host states to renegotiate the terms of bargains struck on entry once MNCs establish viable operations within their territories, and it transpires that some of the tactics utilised by firms to reduce the risk of renegotiation also constitute the basis of an exit advantage. Paradoxically, renegotiation-risk reduction strategies are geared to allowing the firm to remain in the host where it may have worn out its welcome, whereas the exit advantage entails being able to depart the host without undue expense or delay (*cf* Kobrin 1980).

Ramamurti (2003) conveniently summarises the measures a firm might take to enhance its bargaining position *vis à vis* the host or, in the light of this study, acquire an exit advantage. For example, firms may stagger the development of a project, thus reducing the sunk costs and keeping real options open in terms of the geographic situation of further investment. Another staging tactic involves incremental deployment of firm-specific technologies, as political opposition to relocation is likely to be proportional to the technological loss. Using imported inputs is also a way to enhance bargaining power *vis à vis* host governments, and it also ensures that access to these inputs is not compromised should the firm decide to relocate. Finally, it is clear that a firm whose primary market lies offshore has a strong exit advantage, insofar as access to that market will not be jeopardised by relocation from the origin.

If international mobility of production capital is as much a function of barriers to exit as barriers to entry, MNCs are advised to take measures during *investment* to facilitate the process of *divestment*. Firms must take care to work through the costs of offshoring, whether incurred as a result of sale, downsizing or closure, and plan their investments so as to minimise exposure to legal penalties, consumer disaffection, union activism, damage to government relationships or even the psychological deterrent of high sunk costs. Furthermore, minimising exposure to exit barriers is a function to be revisited periodically as the firm's competitive

position, and conditions with a given national location, change. This means firms that do not design investments to minimise foreseeable exit barriers should not regard the future costs of exit as fixed. Instead, when opportunities for restructuring occur, notice should be taken of how the firm can reduce its exposure to exit costs peculiar to their industry and location.

Additionally, exit barriers may be minimised by cultivating good working relationships with unions, governments and local communities in the origin. In this way, the risk of lower of punitive legal action, boycotts and adverse publicity may be reduced. Finally, and despite the lack of statistical support in the present study, firms should remain wary of managerial exit barriers and recognise that inertia can result from a lack of objective input to strategic decision making processes.

14.6.2 Protecting the Exit Advantage

As the concept of the exit advantage presupposes a competitive relationship between the origin state and the internationally mobile firm, it is important that would-be offshorers understand governments as strategic opponents, intent on constructing and maintaining exit barriers, effectively undermining the exit advantage.

If offshoring is perceived to contribute to socially undesirable outcomes, like unemployment, lost public revenues, misallocation of public resources and, most significantly, technological drain undermining national competitiveness, then governments have reason to seek to limit its incidence. Because markets are very sensitive to apparent changes in a government's stance toward the liberalisation of capital flows, a government, conscious that its location advantage has been lost in respect of particular industry, may regard exit barriers as the only means by which offshoring might be managed without inducing a fall off in FDI inflows.

For the origin nation, offshoring is a matter of public concern because it implicates exit and the incidents of loss. From a neoclassical economic perspective, exit *per se* is not detrimental to an economy. Indeed, it is conventionally understood to facilitate the more efficient allocation of resources therein (Caves 1998). Problematically, offshoring is not a movement of capital between industries *within* a national economy. Making an exit from the origin only then to enter a rival national economy delegitimizes offshoring to stakeholders in the origin. The fact that offshoring would seem to serve the general good by enabling nations to specialise according to their comparative advantages counts for little in the context of competition between states for production capital. This leads to the installation of investment incentives, and disinvestment disincentives, by political means. It is not obvious to the countries from which production capital departs that the eradication of national exit barriers serves the national interest in the same way as the elimination of industry exit barriers at the domestic level. However, while public debate centres on unemployment consequences, the fundamental political-economic challenge presented by offshoring is the outward transfer of knowledge and the reduced potential for knowledge creation.

As de Mello-Sampayo et al. (2010) observe, at some point, most countries have sought to exercise control over outward FDI. They cite the use of sanctions against states found in contravention of international norms, and capital account controls, once deemed essential to maintain the balance of payments. Importantly, they calculate that tax rules and subsidies can be shaped to discourage outward investment. However, these measures are not designed to obstruct offshoring in order to retain the technologies exclusive to the MNC.

Firms in industries showing a high incidence of offshoring must remain vigilant as governments attempt to withhold the exit advantage. Methods may include legislative instruments such as mandatory redundancy payments for employees, or ecological restoration of vacated sites, or contractual devices that make an MNC liable to pay penalties for early withdrawal or to reimburse the government for subsidies, grants, tax rebates or other form of support from a national market. Proactive governments may seize the opportunity to construct exit barriers at the inception phase of FDI by encouraging large investments, to accentuate the impact of sunk costs.

More subtle mechanisms can be used to heighten strategic and political barriers to exit. In this regard, the utilisation of *aftercare* techniques may prove to be especially valuable. Aftercare is normally used to describe national and sub-national government services offered at the company level to provide for the continuing development of MNC affiliates (Young and Hood 1995, p. 51). In the context of offshoring, the principles of aftercare may not be confined to the subsidiaries of foreign MNCs in the origin, but to all exhibiting a propensity for international mobility. While aftercare may take the form of subsidies, grants or tax concessions, the emphasis is not on simply bearing the firm's costs, but on enmeshing the firm in a network of relationships with government, organised labour, communities, research institutions and local industry with the goal of enhancing return on investment. Should relocation become a prospect for the aftercare target, the resulting contractual, economic and political ties prove difficult and expensive to sever, or to maintain across national boundaries (*cf* Filippov and Costa 2007). The underlying intention is to present high exit costs to firms facing performance challenges within the country, thus engendering a preference for innovation over relocation.

Obviously, not every policy that discourages exit constructs an exit barrier, as the term is used here. Policies designed to attract and retain FDI are common, but in their turn such policies are vulnerable to the criticism that they place the interests of foreign investors ahead of those of domestic constituencies. Recent research, however, shows it is not impossible for governments to create conditions discouraging the relocation of FDI while not arousing opposition from organised labour, rights activists or political reformers. Blanton and Blanton (2012) found that variables operationalising the quality of democratic institutions, labour rights and personal integrity rights, which concern freedom from various forms of intrusion by the state and others, were positively and significantly related to FDI in industrial sectors where production is relatively mobile. The authors surmise that

firms in these sectors face fewer constraints in their destination choices and prefer investment locations where rights are protected.

14.6.3 What About Outsourcing?

This paper has concentrated on offshoring through FDI, where the international relocation of production is subject to continuity of control in both the origin and destination. It has not directly addressed international outsourcing, where an international relocation of production is subject to a discontinuity of control. How might the two strategies differ in terms of exit barriers?

For the origin, outsourcing and offshoring would seem indistinguishable. Both imply lost skills, jobs, export earnings and tax revenues. However, the finding that political barriers to exit carry the highest inhibiting effect on offshoring suggests that maintaining the exit advantage is easier for outsourcers. A firm engaged in offshoring is betting against the origin as a locus for production, while continuing to express confidence in its own ability to engage in the mobilised line of business. The outsourcing firm, on the other hand, admits to inadequacies of its own in the mobilised line of business, and the decision to source from another nation is entwined with the decision to source from an independent business enterprise. As a result, the stigma of disloyalty to the origin is reduced in outsourcing, because it is not obvious that the firm would cede production to an overseas rival if it were to retain an ownership advantage with respect to the relocated activities.

14.7 Conclusion

Clearly, much more remains to be done in connection to exit barriers and offshoring. Little evidence available indicates that the determination of offshoring is substantively dissimilar to that of EFDI, thus paving the way to the re-evaluation of past research that has not attended to the incidents of exit in the offshoring strategy. There is an urgent need for corroboration and extension of the original study discussed here, looking in more detail at political and strategic exit barriers. This, in turn, will improve our understanding of the exit advantage, its cultivation by MNCs, and its erosion by origin states.

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Chapter 15
Climate Change and the Offshoring Decision: Risk Evaluation and Management

Edgar Bellow

Abstract The problem of climate change is becoming increasingly prevalent in the business context. Risks such as increased risk of extreme weather events and the attendant loss of production site facilities, and changes in population density and migration patterns, may seem remote from the business offshoring decision. However, it is in fact highly relevant, as the recent case of flooding in Thailand and its effects on the global hard drive industry shows. The discussion in this chapter focuses on the risk of climate change for the offshoring decision at the firm level. That is, how does the potential for climate change effects occurring in a given locale influence the offshoring decision? This chapter argues for a risk management approach to climate change at the firm level, in which specific locational risks are assessed as a key component in the offshoring decision. The specific problems of climate change, including the potential for coastal flooding, extreme weather events, and hot or cold waves, do not influence all regions in the same way. Similarly, they also do not influence all firms in the same way. Instead, each firm must determine how climate change could affect its offshoring decisions and to what degree this risk should be controlled. In addition to arguing for the use of risk management for climate change at the firm level, this chapter also provides some tools for assessment and evaluation of climate change risk. These tools include a summary of the risk categories required and a risk exposure/vulnerability matrix that can help assess how significant the risk of climate change is for a given location. The tools within this chapter provide a basic guideline for firms to determine the overall climate change risk levels faced by their outsourcing partners and to make a careful decision based on these perceived risks.

E. Bellow (✉)
Reims Management School, 59, Rue Pierre Taittinger, 51100 Reims, France
e-mail: edgar.bellow@reims-ms.fr

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In late 2011 and early 2012, the issue of climate change suddenly inserted itself into the offshoring debate, in the guise of major flooding in Thailand (Connor 2012). These floods which began with the July tropical storm Nock-Ten and continued through the monsoon season were still persistent as of January 2012. Although it might not seem that this would have a great relevance for Western firms, in fact it did, because the region of Thailand that was worst hit was a center of global computer hard drive production (Connor 2012). The floods proved to be severely disruptive to hard drive production by most suppliers around the world, with some plants closing entirely and others working at reduced capacity (Connor 2012). Ultimately, storage firms including Seagate, EMC, NetApp, Hitachi Data Systems, Dell, and Hewlett Packard were forced to raise prices as the supply of storage units became increasingly constrained (Connor 2012). Unable to meet demand, several of these firms estimated that the price of hard drives would rise 5–15 % over the coming year (Connor 2012). Some of the magnetic drive demand also shifted to solid-state drives (SSDs), whose supply remained strong (Connor 2012). Climate change, once a matter of public policy, had suddenly become a matter of firm-level strategic concern.

Risk analysis is one of the well-established practices in the business decision model, with analysis of financial risk, economic risk, and political risk being common assessment practices in making the offshoring decision. However, there are specific issues associated with the offshoring decision that also need to be evaluated from a risk management perspective, such as the risk of miscommunication due to cultural distance (Berry 2006). This author would like to argue that assessment of climate change risk, rather than being a specialized activity only performed in weather-sensitive industries, should be a part of the firm-level offshoring decision process in all cases. Climate change is a global phenomenon, not a local one, and as such this assessment should be performed for every offshoring decision and not only those that are perceived to be in risky areas. As there are no tools that are currently specifically designed for analysis of climate change risk at the firm level, these tools will need to be developed.

This chapter provides a brief introduction to climate change and then discusses the strategy and ethical responsibility perspectives at the firm level toward assessment of this risk. The chapter then provides a framework for assessment of climate change risk for the offshoring decision, including external risks (physical and demographic risks, political risks, and economic risks) and business-specific risks. Finally, it provides a basic matrix-style assessment tool that could be used to determine the overall climate change risk that a firm faces in a given location.

15.1 Introduction to Climate Change

A simple definition of climate change offered by the American National Snow and Ice Data Centre is as follows:

> All forms of climatic inconstancy (that is, any differences between long-term statistics of the meteorological elements calculated for different periods but relating to the same area)… [Resulting] from such factors as changes in solar activity, long-period changes in the Earth's orbital elements (eccentricity, obliquity of the ecliptic, precession of equinoxes), natural internal processes of the climate system, or anthropogenic forcing (for example, increasing atmospheric concentrations of carbon dioxide and other greenhouse gases) (NSIDC).

Of the causes of climate change listed within this definition, the issue of main concern to firms is anthropogenic climate change, as this is the only form of climate change that can be affected directly by firm operations. The main mechanism of anthropogenic climate change, according to the Intergovernmental Panel on Climate Change (IPCC), is the release of greenhouse gases (primarily carbon dioxide) into the atmosphere (Solomon et al. 2007). These gases affect the temperature of the planet because they absorb additional heat from the sun's rays when these rays are reflected from the surface of the planet, thus causing an overall increase in the surface and water temperature (Solomon et al. 2007). The majority of greenhouse gas emissions are associated with the use of fossil fuels for energy production, transport, and other purposes (Solomon et al. 2007).

There are a number of observable effects on the environment and climate that can be seen from the increase in greenhouse gases. These observable effects have been studied over a long period of time by the IPCC, who has issued ongoing reports that have routinely updated estimates and effects (Solomon et al. 2007). These effects to date include the following:

- An acceleration of the linear global warming trend from 0.74 °C over the 100 years from 1906 to 2005 to an average of 0.2° per decade from 2005 to 2020, resulting in an increase of 0.126 °C per decade more rapid acceleration in climate change;
- Observed and projected changes in snow cover (expected to be reduced overall, especially including reduction in depth of permafrost), increasing extremes of heat and cold, particularly heat waves and high precipitation events;
- Changes in precipitation patterns and a shift in precipitation locations from subtropical and tropical regions to high-altitude drier regions;
- Increases in sea level resulting from melting of polar sea ice, ice caps, and glaciers;
- Changes in water resource availability due to glacial melt, particularly affecting high-mountain regions that are dependent on glacial water supplies;
- An increase in severity and frequency of adverse weather events, such as heat waves, hurricanes and cyclones, severe storms, monsoons, and blizzards, and changes in patterns of adverse weather events from historic patterns (Trenberth and Jones 2007).

While all regions experience some degree of climate change, not all regions are affected equally. The IPCC has determined that the Asia Pacific region will experience increased intensity of typhoon and monsoon seasonal weather patterns (as the Thailand flooding clearly shows) (Trenberth and Jones 2007). Other expected effects include intensification of strength and frequency of hurricanes in North and South America, rain forest damage, increased temperatures in temperate climates such as North America and Europe, and ongoing desertification and extreme weather events in Africa (Trenberth and Jones 2007). In other words, *all* locations that are likely to be candidates for offshoring are also likely to experience climate change, but the specific type of change that will be seen will vary widely.

15.2 Offshoring

The core business process considered within this research is offshoring, which is a common business activity for firms of all sizes. Offshoring can be defined as "a strategy of relocating business processes, services, and work to overseas locations, where it makes most business sense, by capitalizing on the global skill pool, advances in communication technologies, and the benefits of cost arbitrage (Babu 2005)." Offshoring can be seen as a form of foreign direct investment (FDI), in which firms seek out specific advantages that are associated with a given geographic location (Lewin et al. 2009).

While offshoring and outsourcing are commonly conflated, there is a subtle difference in meaning between the two processes; while offshoring refers to a company's internal operations in a location outside the home country, outsourcing implies a contractual vendor relationship with another firm that provides services outside the home country (Bunyaratavej et al. 2011). Offshoring and outsourcing are commonly discussed under principles including the eclectic theory, the competence-based view of the firm, network theory, the Uppsala model of internationalization, and a number of other theories that address specific elements of the outsourcing transaction (Hätönen and Eriksson 2009).

Offshoring is commonly seen by firms as a way to reduce costs, increase manufacturing flexibility and open up new markets (Farrell 2005). The ability to increase the number of workers and to acquire cheaper capital investment means that firms can rapidly increase capacity and lower the cost of manufacture; at the same time, providing industrial employment in developing regions also provides an increased consumer base, at least for some companies (Farrell 2005). As such, firms have powerful incentives to offshore their manufacturing or services, and they have taken advantage of this. Outsourcing, a specialized form of offshoring, began during the 1950s, but did not become a common business strategy until the early 1990s (Hätönen and Eriksson 2009). Within 10 years, outsourcing no longer provided competitive advantage, but was instead a common business strategy (Hätönen and Eriksson 2009). Today, strategic use of both offshoring and outsourcing is driven by increasing competition to cut costs, both in unskilled and in

skilled labor (Contractor et al. 2010). Standardization of business processes has also played a role in increasing the use of offshoring services; this is true both for routine business processes and for high-value and specialized processes such as research and development (R&D) and engineering (Contractor et al. 2010). However, whether these returns can be supported on an ongoing basis is dependent on several factors, including the ability to continue to standardize production and business processes and the ability to customize business processes in an efficient manner (Sako 2006). As such, even though offshoring and outsourcing are often effective, it should not be taken for granted that they will continue to be effective in future.

Typically, firms outsource what they consider to be core (or essential) and non-core operations and outsource those that are considered to be non-core (Contractor et al. 2010). However, the perception of core or non-core is changing over time as well, as firms make increasing use of offshoring to perform core functions. Of particular interest is the increasing rate of offshoring associated with innovation and research and development, which has largely been driven by increasing demands for scientific and engineering human resources that are not being met by the work force in the developed countries (Lewin et al. 2009).

There are a number of issues that are associated with offshoring, including performance management, innovation, organizational governance, and external contextual factors (Bunyaratavej et al. 2011). One of the contextual issues that the firm must deal with is climate change. Offshoring, as well as other forms of international trade, is implicated in the intensification of climate change over the past few decades. From 1990 to 2008, there was an estimated increase in emissions associated with exported production between 20 and 26 % (Peters et al. 2011). Notably, this growth in emissions is faster than the average GDP, population, or overall carbon emissions, although lower than the growth in dollar value of international trade (Peters et al. 2011). This growth in emissions can be attributed to increasing transportation of people and goods, increasing distance from food sources and other transport-related factors, and increasing energy consumption and resource usage among all nations (Solomon et al. 2007).

Offshoring is expected to continue to grow over the next several years, as it becomes an entrenched practice and may eventually result in a fundamental transformation of the firm structure and function (Lewin and Peeters 2006). However, embedded in the cost savings achieved by the firm are various forms of hidden costs, such as costs associated with perceptions of ineffectiveness by consumers and costs associated with inefficiencies caused by geographic, cultural, or interaction distance (Stringfellow et al. 2008). This chapter's main argument regarding offshoring and climate change is that climate change is one of these potential hidden costs, and the cost of climate change needs to be taken into account in order to effectively determine the savings (or potential savings) from offshoring.

15.3 Risk Management

The framework used to analyze the problem of determining the cost of climate change for firm-level offshoring practices is the risk management framework. A simple definition of risk is "the chance that harm will occur (Chicken and Posner 1998)," which is nominally calculated by a combination of hazard (or the potential for harm) and exposure (or the chance of the hazard occurring). Acceptance of risk may be based on judgment of its appropriateness, given a number of factors including knowledge, judgment, trust, regulation, bias, the nature of the risk, funding, political beliefs, aims, and supply and demand (Chicken and Posner 1998). (These are general factors in risk acceptance and may not always apply for a given project or development).

Following on from this definition of risk, *risk management* can be defined as an attempt to reduce downside loss or volatility from risks that are encountered in the operating environment (Andersen and Schrøder 2010). The history of risk management can be seen in the operations of insurance companies and other industries, such as shipping and trade that have traditionally seen increased levels of risk associated with their activities (Andersen and Schrøder 2010). However, the modern practice of corporate risk management, in which corporate strategy is specifically focused on identifying and eliminating (or at least mitigating) risk from its activities, is a relatively new development (Andersen and Schrøder 2010). Risk management is not limited only to the specific issues that are directly within the firm's control, however. Instead, Andersen (2008) argues strongly that the firm can use risk management to reduce the threat of lost earnings even from risks that are outside its own control. There is a positive statistical relationship between risk management strategies and stabilization of corporate earnings, according to one empirical study of 1,369 companies, indicating that this practice has the ability to improve corporate earnings (Andersen 2008). Thus, there is a strong rationale for the use of risk management as a framework for making decisions related to offshoring, as well as those related to other issues the firm may face.

Currently, climate change is classified as an uncertain risk, indicating that although it is highly likely there will be some degree of risk involved in the business operation, the extent or impact of this risk is not yet fully understood (Andersen and Schrøder 2010). This makes climate change risk more difficult to use a risk management approach with than other risks that are more certainly known, such as interest rate risk. However, given that much of climate change that firms need to be concerned about involve extreme adverse weather events and their after effects, this can be approached under a catastrophic event planning approach, in which a proactive approach is used (Narasimhan and Talluri 2009).

In terms of the existing literature on risk, the most appropriate positioning for climate change risk in offshoring is under supply chain risk, as the offshoring process is used by many firms as a link in the supply chain. Making the offshoring or outsourcing decision is commonly known to be problematic in terms of risk management, as the decision to use the practice is often undertaken without any

specific risk assessment or even specific goals in mind (Lonsdale 1999). Lonsdale has suggested that the use of a risk management framework is appropriate for making supply chain decisions, a suggestion that this research expands upon. The risk management process for supply chains involves identifying objectives and performance goals and then determining what risks will be seen in the process of achieving these performance goals (Narasimhan and Talluri 2009). Identification of risks is then followed by an attempt to determine what strategies could be used to eliminate or mitigate them (Narasimhan and Talluri 2009). The offshoring firm will particularly need to plan for catastrophic events to occur within the supply chain, given that these events are likely to impose higher and more sudden cost burdens than slow change processes (Knemeyer et al. 2009). For example, the catastrophic effects of Thailand's flooding, discussed at the beginning of this chapter, had the ultimate effect of constraining the supply flow for major makers of computer hardware systems, including both consumer-level PC systems and enterprise-level storage systems (Connor 2012). This type of effect should have priority in the catastrophic events planning process. Unfortunately, many companies only come to an awareness that they need to use risk management in their supply chain practices after a major disaster or occurrence. One example of such a company is Swedish cellular phone maker Ericsson, who did not implement risk management practices in their supply chain until after a sub-supplier that manufactured radio frequency chips experienced a fire in their production facility (Norrman and Jansson 2004). This was an exceptionally expensive oversight for Ericsson, which reported a loss of $400 million in 2001, primarily attributed to this incident. Thus, the use of risk management in the supply chain is well supported as a means of avoiding potential losses from unforeseen risks in the supply chain.

15.4 Climate Change Risk Management in the Offshoring Decision

The discussion of climate change above clearly highlights reasons why it might be vital to understanding the firm's offshoring decision. However, it does not clearly indicate how the decision regarding offshoring can be made. This section of the chapter discusses the firm's responsibility toward climate change and the importance of risk management as an approach. It then provides a risk management framework derived from climate change and risk management literature that highlights the basic issues the firm needs to take into account.

15.4.1 What is the Firm's Responsibility?

There are a number of reasons why the firm has the responsibility to engage in climate change risk management. First, there is the potential for financial loss or market share loss for the firm; since the manager of the firm has the fiduciary duty

to shareholders to identify and mitigate material risks (Lorenz 2008), the risk of loss means that climate change must be considered in the risk management process. A framework of decision making that integrates consensus versus uncertainty, uncertainty versus probability, and short-term versus long-term concerns can help determine the overall weight of climate change in the decision (Lorenz 2008). Climate change research has reached a state of general consensus, and there is a high probability of effects being seen (although the specific effects to be seen are as yet uncertain). Furthermore, this is a long-term concern. Thus, climate change is a part of the analysis required to enact the firm manager's fiduciary duty.

An additional reason for the firm to take climate change into account is an ethical dimension of the offshoring decision. Carbon emissions are not localized, but are global, and firms that engage in offshoring without taking care to control carbon emissions cause global damage (Eckersley 2010). The transfer of carbon emissions from richer countries to poorer ones through offshoring is also a negative externality (Eckersley 2010). Thus, in order to discharge overall ethical requirements to not take advantage of negative externalities, firms need to make a conscious effort to evaluate climate change impacts and effects of their offshoring decision. This can be seen as an extension of the corporate social responsibility practice, in which the firm takes into account a stakeholder perspective and integrates the interests of stakeholder groups beyond the owners of the firm into its practices (Kytle and Ruggie 2005). Thus, in a sense, the consideration of climate change is oriented not just toward the specific risks of climate change itself, but also toward controlling and mitigating social risk, which can affect consumer demand, regulatory oversight, and employee satisfaction (Kytle and Ruggie 2005).

Of course, the question should be asked as to whether environmental concerns should play a role in firm decision making. Traditional thinking has been that consideration and mitigation of environmental risks are the unnecessary cost and that it decreases the firm's earnings and profits (Ambec and Lanoie 2008). However, Ambec and Lanoie's analysis shows that under current operating conditions, taking into account environmental risk has a number of advantages for the firm, including improved market access, product differentiation, and consumer preference, and other advantages including reduced cost of labor, capital, and inputs. This chapter, which focuses on the development of climate change as an area of environmental concern (even though it is outside the direct control of the firm), is based on research such as Ambec and Lanoie's, positing that taking climate change into account can provide financial benefits for the firm.

15.4.2 Risk Management for Climate Change

There are a number of potential risk areas identified for climate change, although many of these risk areas are more oriented toward the country level than the firm level (as this is where most of the research has occurred). However, some of the elements of this high-level risk analysis can be examined at the firm level. In

general, the vulnerability of a region can be understood as a combination of its risk exposure and its ability to cope with or mitigate the risks it is exposed to (Bogardi 2004). The separation of these components of risk is required to understand the differences in various regions that may nominally be exposed to the same level of risk (Bogardi 2004).

One category of risk is location and demographic risk. Some potential risks in this category that could affect a firm's offshoring decision include the simultaneous increase in flood risk and reduction in water supply availability associated with melting glaciers; the risk of declining crop yields due to increasing temperatures, an increase in vector-borne disease and heat and cold-related deaths, and increased coastal flooding and loss of coastal areas (Stern 2006). These risks could potentially affect capital plant and equipment, human resources, and raw materials availability as well as transportation and communication links. However, these risks are not distributed evenly around the world; the highest risk *and* highest vulnerability are borne by developing regions including South America, Asia, and Africa, which are characterized by higher agricultural dependence, poorer institutions, and fewer resources to combat these results (Stern 2006). This has serious implications for offshoring in popular locations such as China, India, and Indonesia. The cost of this type of risk is expected to be high, for example, a risk analysis for rising sea levels in Copenhagen, Denmark suggests total private and public losses of between one and six billion euros, mostly concentrated in transportation, post, and communication services (Hallegatte et al. 2011).

The second major risk category to be considered is political risk. Political risk from climate change includes effects on vulnerable occupations (such as agriculture and fisheries), increasing poverty, migration, and weak states (Barnett and Adger 2007). These risks both deplete regions undergoing climate-related stress of valuable human resources (one of the main reasons many firms choose to use offshoring in the first place) and increase threats to human security and increase the potential for armed conflict (Barnett and Adger 2007). Given that political risk, particularly the strength of the state and the potential for armed conflict, is already of concern in the offshoring decision, this element of risk is simply an extension of existing risk management approaches.

The third major risk category applicable to climate change is economic risk. To some extent, there is limited control that a firm can exercise over economic risk associated with climate change, but this does not mean that firms will not feel the effects. With an estimated loss of 20 % per capita decrease in GDP worldwide (Stern 2006), there is likely to be a significant fall in demand due to reduced personal income. Additionally, government regulations are likely to require increase efficiency on the part of producers by as much as 25 % in order to achieve environmental targets (Stern 2006). As such, while economic risk is not directly controlled by the firm or necessarily dependent on the location choice, this is still an issue for long-range strategic planning.

The final category of risks that needs to be taken into account for the climate change risk assessment is business-specific risks. Unlike the previous risks, business-specific risks can be (at least to some extent) controlled or mitigated by the firm through choice of location, operational mode, or mitigation strategy. Table 15.1 summarizes key business-specific risks that could be affected by climate change conditions, although this summary should not be presumed to be exhaustive.

Table 15.1 Business risk categories for climate change

Risk category	Brief description
Insurance risk	Insurance risks arise from the potential for physical damage to property, plant, equipment, and human life that some of the effects of climate change, such as sea level changes or adverse weather events (Dawson and Spannagle 2009). The insurance industry is highly aware of the potential for negative effects of climate change and as such has engaged in substantial risk assessment and planning (Dawson and Spannagle 2009). As such, the firm may face the risk of increased premiums and assessments if choosing to locate in a high-risk area, which cannot be easily avoided through such means as requiring vendors to carry insurance
Finance risk	Finance costs associated with a perceived risky operation based on the potential for force majeure (extreme and unpredictable events) resulting from climate change may be higher than costs that are not associated with this type of operation (Choucri et al. 2007). Firm-level risk assessments do not commonly take into account the problems of climate change (Choucri et al. 2007), which could make finance planning inaccurate
Supply risk	Firms that are dependent on suppliers in regions vulnerable to climate change, or that rely on inputs (such as lumber) that are themselves vulnerable to climate change, may face significant supply risk (Choucri et al. 2007). As the case of Thailand's flooding shows, firms themselves may create supply risks through concentration in vulnerable areas
Infrastructure risk	Offshoring success depends on available transportation, communications, and electricity infrastructure, but this type of infrastructure can be strained or even broken by extreme adverse weather events (Hallegatte 2009). This risk is generally beyond a firm's ability to mitigate, but examining the government strategy for dealing with infrastructure risk (such as overbuilding or changing planning models) will help determine how much vulnerability the firm faces (Hallegatte 2009)
Human resource risk	Climate change risks such as increased in vector-borne illness, desertification, crop failure, or destruction of settlements by extreme adverse weather effects carry with it the potential for significant out-migration from an area, though the level of out-migration can be difficult to assess due to multiple causes (Mearns and Norton 2010). Regions in vulnerable economic areas may not have sufficient resources to deal with migration flows or prevent them through assurance of water quality, housing, or health care (Mearns and Norton 2010). This poses a significant risk at the firm level because regions that do not have an ample supply of human resources are generally unsuitable for economically efficient offshoring operations

15.4.3 Proposed Risk Management Framework

There are no identified general-purpose risk management frameworks for use in assessing climate change risk currently available. Because of this gap in the literature, a modified version of the Roadmap to Assess the Economic Cost of Climate Change, a large-scale assessment tool (Hallegatte 2009) has been prepared as a preliminary assessment tool. However, this assessment tool should not be used casually, because there is a significant knowledge gap in the general-purpose knowledge regarding climate change and its true effects (Sandblad et al. 2007). Although general awareness of climate change is growing, there is still a consistent underestimation of its severity and effects, as well as confusion between climate change and separate (though related) environmental issues like ozone depletion (Reynolds et al. 2010). This suggests that either substantial research or expert knowledge should be used in order to supplement layperson knowledge regarding climate change for this analysis.

The framework that has been created is based on a matrix of risk exposure and risk vulnerability, in order to take into account both aspects of risk that are discussed in the literature (see discussion above). Figure 15.1 shows the assessment matrix that is used to determine threat levels for each of the risks identified. The use of this assessment matrix is similar to the use of other matrix-based assessment tools, which should be familiar to the strategy analyst. Following consideration of each of the risks involved in the specific offshoring location, the overall risk is assessed based on weighting of the risk involvement. This provides a rapid assessment tool for the determination of which risks pose a significant threat and whether the site is simply too risky to be considered. Each risk that is included is a *location/risk pairing*, that is, the risk level is specific to the location considered for offshoring, rather than being a generalized level of risk associated with the offshoring activity itself.

A summary of each of these factors is as follows:

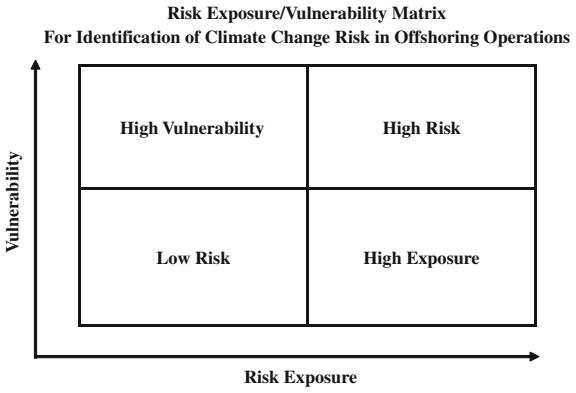

Fig. 15.1 Risk exposure/vulnerability matrix for assessment of climate change risk to offshoring operations

- A low-risk location/risk pairing is found in a location that has an absolutely low risk of exposure to a specific climate change challenge; it has both low-risk exposure and low vulnerability to the risk involved. An example of a low-risk location/risk pairing would be the risk of flooding due to sea level change in an inland location.
- A high-exposure location/risk pairing is found in a location that has high exposure to a specific risk, but which has existing adaptations in place in order to reduce vulnerability to the risk. An example of this type of location/risk pairing would be flood risk in a port city with a sophisticated flood control system that is well maintained and supported by the government. This risk is most likely to be of concern for short-run business risks, including finance risk and insurance risk, since these areas will be subject to very conservative models.
- A high-vulnerability location/risk pairing is found in a location that has high vulnerability to a given risk, although the risk itself may be relatively low. An example of this type of risk is the potential for vector-borne illness in a region that is adjacent to an area where this disease is endemic and which does not have mechanisms in place to reduce its spread. The high vulnerability poses two main categories of risk, including the potential for catastrophic effects from an unanticipated event and long-run risk that a slow-growing risk may not be appropriately met.
- A high-risk location/risk pairing is absolutely high risk—it has both high-risk exposure and high vulnerability to a given risk. An example of a high-risk location/risk pairing is the risk of coastal flooding in a Pacific Rim coastal city in a developing country, which will have both increased exposure to the risk and increased vulnerability. These risks should be treated as both short-run and long-run threats to viability of an offshoring strategy and should be targeted with risk mitigation strategies before moving forward.

In addition to a risk analysis matrix, this framework includes a number of identified risks that should be considered (Table 15.2). These identified risks should be considered to be neither generalized nor comprehensive, but serve as a starting point for location risk assessment. Geographically specific risks and risks associated with political structures should also be considered. This risk assessment process should be performed in unison with other strategic planning exercises.

The suggested stages of use of this framework are to first identify the risk levels involved (with verbal description of the risks, in order to provide more information and a basis for assessment) and then to graph the resulting matrix in order to provide a visual representation of the overall climate change risk involved in a given location. This approach will help to identify the overall level of risk involvement in a way that can be contextualized and understood in decision-making practices. The provision of additional qualitative information will help understand the overall types of risks involved as well as provide opportunities to assess risk mitigation strategies that could be used. However, it should be kept in mind when using the matrix representation that not all risks are equal; thus, the verbal description must remain the main decision-making tool.

Table 15.2 Risk assessment framework for climate change in proposed offshoring operations

Risk area	Risk level (low/high)	Risk vulnerability (low/high)	Risk quadrant (low risk, high exposure, high vulnerability, high risk)
Location and demographic risk			
(1) What is the potential for coastal flooding or inland flooding due to sea level change?			
(2) What is the potential for reduced water resources due to glacier melt?			
(3) What is the potential for increased transmission or severity of vector-borne illness?			
(4) What is the likelihood of increased cold or heat-related deaths?			
(5) What is the likelihood of increased severity or frequency of the following extreme adverse weather effects?			
(a) Hurricane or cyclone			
(b) Tornado			
(c) Snow or blizzards			
(d) Increased rains or monsoons			
(e) Changes in seasonal weather patterns			
(f) Other extreme adverse weather effects			
Political risk			
(6) What is the overall political vulnerability to climate change due to weak institutional frameworks or other factors?			
(7) How high is the involvement of region in vulnerable professions (coastal, agriculture, water dependent)?			
(8) What is the likelihood of changes in migration patterns or changes in human resource availability due to climate change?			
(9) What is the overall weakness or strength of the state in terms of climate change assessment?			
Economic risk			
(10) Infrastructure maintenance: does the region have effective long-term planning strategies in place to help ensure infrastructure viability?			
Business-specific risk			
Note the company, rather than the location, is the target of the business-specific risk considerations			
These risks should be assessed qualitatively and mitigation strategies identified			

(continued)

Table 15.2 (continued)

Risk area	Risk level (low/high)	Risk vulnerability (low/high)	Risk quadrant (low risk, high exposure, high vulnerability, high risk)
Insurance risk		Will the company face increased insurance costs due to vulnerability of the area to climate change risks as assessed by insurance providers?	
Finance risk		Will the company face increased cost of capital due to increased perception of risk by investors, particularly due to force majeure or potential for gradual financial loss or degradation?	
		What is the company's risk exposure to equipment loss from sea level change or extreme adverse weather events, resulting in increased demand for finance?	
Supply risk		Is the company dependent on suppliers or natural resources that would be affected by climate change outside the offshoring area?	
Infrastructure risk		Does the company have specific infrastructure needs that would be threatened by climate change and if so is the provision for infrastructure development used in the region sufficient?	
Human resource risk		Will the company be able to continue to maintain required staffing levels from the offshoring vendor given the potential human capital risk factors such as vector-borne illness and migration? Does the region have, or can the company provide, risk mitigating factors such as sanitary living conditions and health care?	
Regulatory risk		Does the firm's activity (particularly manufacturing activity) place it at increased risk of regulation, such as through restriction of carbon emissions, increased taxation, or uncertain or developing regulation?	
Corporate governance risk		Does the overall risk profile of the region meet the fiduciary and ethical duties of the corporation to protect the investment given the climate change risk involved?	

15.5 Conclusion and Future Directions

The increasing intensity of weather and climate issues that can be attributed to climate change makes it clear that this must be a consideration in the firm-level offshoring decision. The need to make strategic decisions that minimize supply constraints or damage to firm capital equipment and personnel means that offshoring in regions that are likely to undergo significant climate change effects should be considered carefully. Furthermore, there is an ethical element to this offshoring decision as well, as firm decision makers must consider whether they are taking advantage of negative externalities gained by offshoring and relocating production to poorer regions. A risk management approach can be used to take these issues into account, consistent with risk management in various other areas.

This chapter has provided a basic framework for evaluation of risk associated with climate change. However, substantially more work remains to be done, including identification of specific risks and quantification of these risks as well as determination of how climate change risk can be mitigated. More fundamentally, the risks of climate change clearly show how the firm's risk management process must be tied to regional and even global environments in order to be effective at identifying and mitigating risks. At the present time, it is not clear how to determine what effects climate change may have on pricing or supply of goods or on the overall use of offshoring in the long term. Thus, although this basic framework offers a starting point for consideration of this issue, there is substantially more research and issues that need to be explored.

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Chapter 16
Do Expectations Match Reality When Firms Consider the Risks of Offshoring? A Comparison of Risk Assessment by Firms with and Without Offshoring Experience

Peter D. Ørberg Jensen, Torben Pedersen and Bent Petersen

Abstract The risk associated with offshoring is a recurrent theme in research. However, previous research has mainly given a static picture of offshoring risks even though the strategies of offshoring firms, including their views on risks, may change as they gain experience in the field. In this chapter we investigate the influence of organizational learning on firms' perceptions of the risks in offshoring. We use survey data from firms in Scandinavia and compare the risk assessments of firms without offshoring experience with firms that engage in offshoring. The findings show that firms without offshoring experience particularly stress exogenous risks while firms with offshoring experience see the endogenous risks as important. We offer two different interpretations of these results.

Keywords Offshoring · Offshore outsourcing · Risks · Organizational learning

16.1 Introduction and Background

In the wake of the offshoring "hype" (Lewin and Peeters 2006) at the turn of the century, skepticism arose in the business press about the real costs and benefits of relocating business operations to low-cost destinations (see e.g. BCS 2009; Blum

P. D. Ø. Jensen (✉) · T. Pedersen · B. Petersen
Department of Strategic Management and Globalization,
Copenhagen Business School, Kilevej 14, 2000 Frederiksberg, Denmark
e-mail: poe.smg@cbs.dk

T. Pedersen
e-mail: tp.smg@cbs.dk

B. Petersen
e-mail: bp.smg@cbs.dk

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2004; Davison 2003). The general contention was that the presumed benefits of offshoring were greatly exaggerated and the expected costs and risks grossly underestimated (Deloitte 2008). In other words, expectations about the economic and strategic benefits of offshoring did not match a reality of unforeseen operational, contractual, and strategic problems as well as risks of uncontrolled knowledge leakage and loss of competencies.

This chapter addresses the questions of how firms' expectations match—or mismatch—reality when it comes to the operational and strategic risks of offshoring. We compare the risk assessments of Scandinavian (i.e. Danish, Norwegian and Swedish) firms *currently* engaged in offshoring of administrative and technical tasks (popularized as "white collar services") with those of Scandinavian firms that so far only are *considering* offshoring of these tasks. The reason is to assess whether the risk assessment changes as firms gain their own experience in offshoring. We measure the risk assessment of these two groups of firms in relation to a wide range of risk parameters including both external and internal risk factors. Hence, the chapter is organized as follows:

In the next section (Sect. 16.2) we present facts about the Scandinavian survey which makes part of a larger, multinational and repetitive survey of firms that are currently offshoring technical and administrative tasks or considering doing so. The academic institutions conducting the surveys on national or regional basis (such as Scandinavia) are organized in the Offshoring Research Network (ORN) anchored at the Fuqua School of Business, Duke University, USA. Section 16.3 presents the results of the part of the Scandinavian ORN survey that pertains to firms' perceived business risks of offshoring. In Sect. 16.4 we discuss these results. In particular, we suggest potential explanations and causes of the observed mismatches between risk expectations and risk reality. These causes include overconfidence in the firm's coordination and contract design capabilities as well as bounded rationality of managers, but also methodological issues such as reliability and construct validity. The final section concludes and discusses managerial implications.

16.2 The International Business Literature and the Benefits and Risks of Offshoring

Although our focus in this chapter is on the risks associated with offshoring it is clear that a firm's strategic considerations concerning which value chain activities to offshore, where to offshore, and how to organize the offshoring operations (i.e. firm-internal vs. firm-external operations) rest on an assessment of the expected risk-return tradeoff associated with the specific offshoring operation. Potentially, engaging in offshoring offers considerable returns from arbitraging differentials in global factor endowments and from exploring knowledge and capabilities in offshore locations, but it also entails significant risks. Any manager has his/her own risk-return tradeoff point in investments, including the investments in offshoring operations. The research literature on offshoring and outsourcing is founded on

different (and to some extent competing) theories which also reflects that there are different views on the benefits, costs and risks associated with offshore outsourcing (Hätönen and Eriksson 2009; Kotabe et al. 2009). So far there is no clear indication of what specific activities are particularly advantageous or risky to outsource offshore (Hätönen and Eriksson 2009), including capabilities (resources) that are "close to core" (Quinn 1999). Therefore, there is no standard recipe for decision-making which firms may use, as the idiosyncrasies of the individual firm, activity attributes, in-house capabilities, industry context, managerial preferences, altogether shape the risk-return tradeoff in each specific case. Rather, there is a range of frequently cited potential benefits and risks in the research literature which firms may take into consideration and then decide which of these to give special attention.

As Kotabe and Mudambi (2009) note, there are opposing views on the long-term implications of foreign sourcing strategies which are related to the sustainability of firms' core competencies, particularly when firms begin to increase reliance on independent parties (Kotabe and Mudambi 2009; Mol 2007). Taking Kotabe et al. (2009) as the starting point, we may summarize a range of the frequently cited potential advantages and risks related to offshoring and list a selection of research contributions that focus on these aspects.

Regarding the potential benefits of offshoring, in particular the cost advantages stemming from lower labour costs in developing and emerging economies stand out throughout the research literature as the main benefit (see e.g. Amiti and Wei 2009; Farrell 2005). As for the collaboration with external partners in offshore outsourcing arrangements, other authors (Kedia and Lahiri 2007; Quinn 1999; Quinn and Hilmer 1994) have stressed that the home/client firm may complement and leverage own capabilities through partnering. In other studies based on data from the ORN database, Manning et al. (2008) and Lewin et al. (2009) have emphasized that offshoring is an opportunity to compensate for skills shortages in the domestic labour market and enhance existing firm resources, or build new resources, through access to complementary human resources at host destination. By extending similar arguments regarding resource complementarities to inter-firm linkages, a number of scholars have described the potential value for home firms in building close and long-term relationships with other firms so that these partnerships have much in common with strategic alliances (Kedia and Mukherjee 2009; Mudambi and Tallman 2010; Vivek et al. 2009). In addition, the offshoring destination itself, i.e. an entire country or a city/industry cluster, may be of value to foreign firms as these firms get access to specific, locally embedded skills and knowledge at offshoring destinations (Bunyaratavej et al. 2008; Dossani and Kenney 2007; Jain et al. 2008; Jensen and Pedersen 2011; Zaheer et al. 2009).

While there appears to be consenting views as regards the potential benefits associated with offshoring, the nature and magnitude of the risks are more unclear yet intensely debated, and there are still only limited empirical data underpinning these debates (Bunyaratavej et al. 2011). Furthermore, it adds to the challenge for managers that the potential benefits and risks are linked and thus form a double-edged sword. For example, aggressively pursuing and investing in knowledge

exploration through offshoring might bring great value to the resources of the home firm but the firm might also risk knowledge slippage and erosion of critical knowledge resources. In particular for outsourcing arrangements this risk of resource erosion (a notion which is also referred to as the "hollowing-out" of the home/client firm; Kotabe (1989), whereby the critical resources of the firm would be gradually destroyed, stands out as a major strategic risk that may threaten the long-term competitiveness and survival of the firm (Kotabe 1989; Kotabe et al. 2008; Lei and Hitt 1995).

Second, prior research has pointed out that the perception of risks may vary from one firm to the other. Organizational risk perception is defined as the organization's assessment of how risky a situation is in terms of probabilistic estimates (Mitchell 1995; Sitkin and Weingart 1995; Harwood et al. 2009). As an example, two organizations may be equally risk tolerant, but their assessments of the risks associated with offshoring advanced IT services at an Indian service provider may differ significantly. Organization *A* may be overly pessimistic in its risk assessment and therefore put aside any plans of offshoring its IT services, whereas organization *B* underestimates the risks and consequently embarks on the offshoring venture without concerns. Obviously, the accuracy by which an organization carries out its risk assessments depends on its available resources in terms of in-house expertise as well as its financial capacity to hire consultants from outside. However, the risk assessment accuracy may also be influenced by the risk tolerance of the organization, that is, the organization's current tendency to take or avoid risks (Sitkin and Weingart 1995; Harwood et al. 2009). Therefore, a risk willing organization may be complacent and/or too optimistic (overconfident) when assessing offshoring risks (Brockhaus 1980; Vlek and Stallen 1980), and vice versa.

Third, in offshore outsourcing collaboration high hopes may transform into sour relationships as different problems between partnering firms accumulate over time. Earlier studies indicate that as many as half of the firms which engage in offshore outsourcing do not seem to find their expectations realized (Lacity and Rottman 2008), and managing a difficult inter-firm relationship, with e.g. problems related to the opportunistic behavior of the external partner, is costly and potential synergies are not likely to materialize (Ellram et al. 2008; Kern et al. 2006; Williamson 2008). In addition, the costs of managing an offshoring operation may increase further if there is a mismatch between the characteristics of the activities offshored, the attributes of the offshoring destination (e.g. skills, capabilities, cultural distance, language), interface and interaction between onshore and offshore personnel (Dibbern et al. 2008; Kumar et al. 2009; Stringfellow et al. 2008). In such cases the coordination costs, resulting from the "hidden costs" of offshoring, will be high and potential synergies consequently not likely to be realized.

This brief literature review shows that the risks associated with offshoring is a recurrent, and complex, theme. Simultaneously, research has shown that the experience with offshoring which firms build over time is an important determinant of learning and catalyst for change in the offshoring strategies of firms (Carmel and Agarwal 2002; Jensen 2009; Maskell et al. 2007). We may therefore

also expect that the perception of risk changes as firms gain experience with offshoring operations. For firms not involved in offshoring operations, the perception of risk is based on unknown factors and with practical experience and handling of problems, their assessment might change. However, extant research in the field does not shed much light on the change aspects of the firm and managerial risks associated with offshoring. Thus to our knowledge there is a gap in the literature in terms of models and theoretical approaches that can explain how firms' perception of risks change over time. In the following we address exactly this question as we compare inexperienced firms' (i.e. firms that are considering offshoring but not currently are engaged in offshoring) perception of risks with experienced offshoring firms (i.e. firms that implement offshoring operations at the time of data collection).

16.3 Methodology and Data

16.3.1 Facts About the Survey

The survey was launched in Scandinavia in 2008 as part of the ORN project where the same questionnaire is applied among US and European firms in order to track offshoring drivers, risks, and concrete implementations over time. The data in this chapter builds on responses for 125 implementations mainly in information technology, engineering services, and software development (making up about half of all Scandinavian implementations). An additional asset of the Scandinavian database is that it is almost equally split between firms that are considering to offshore and firms that already have experience with this type of foreign operation. The equal distribution makes the Scandinavian database well-suited for comparisons between the two groups of firms. The database includes very detailed information for each offshoring implementation on motives, strategic drivers, effects, etc. However, the focus in this chapter is on the differences in business risk perceptions among the—in terms of offshoring—experienced and inexperienced firms. In this chapter we define operational and strategic risks as the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events, including reputational risks (damage to an organization through loss of its reputation or standing) and the risk of a loss arising from a poor strategic business decision.

16.3.2 Results from the Scandinavian Survey

Figure 16.1 shows the difference between firms that are *considering* offshoring and those that *currently* are offshoring in terms of the percentage that perceives various business risks—operational as well as strategic—as 'important' or 'very important'.

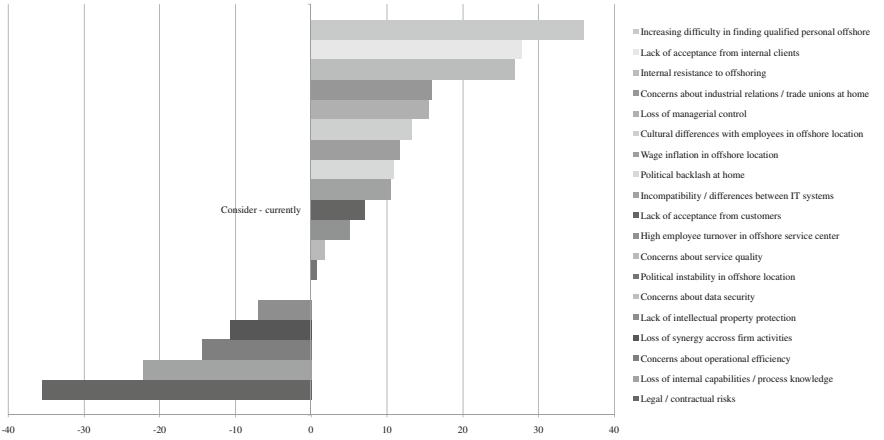

Fig. 16.1 the difference between firms that are *considering* offshoring and those that *currently* are offshoring in terms of the percentage that perceives various business risks—operational as well as strategic—as 'important' or 'very important'

If we use a 10+ percentage points difference as a threshold for 'significant' divergence between expectations and reality—"reality" defined here as the risk perceptions of firms that currently are offshoring—four risk parameters stand out as being strikingly different from the perspective of firms that are considering offshoring. As an example, among the firms *considering* offshoring only 10.53 % indicate "Legal/Contractual risks" as 'important' or 'very important' against a high 46.15 % of the firms *currently* offshoring. The difference is then $-35.62\ \% > 10\ \%$—and thus indicating significant underestimation of this risk factor. These business risks are either related to internal factors or associated to third party service providers. The two risk factors that by far are the most underestimated—"Legal/Contractual risk" and "Loss of internal capabilities/process knowledge"—are presumably mainly assumed in relation to third party service providers, i.e. offshore outsourcing. One might therefore speculate if the gap between the two groups of sample firms can be explained by differences in terms of the expected and realized use of offshore *outsourcing*. If the group of firms that are considering offshoring mainly anticipate carrying out this offshoring as a captive/in-house operation this group of firms would be less concerned about contractual risks and risks of losing capabilities. However, the two groups differ only slightly as to the ownership structure—and definitely too little to explain the risk perception gap.

Two noticeable *internal* factors are "Concerns about operational efficiency" and "Loss of synergy across firm activities". The firms that currently are offshoring perceive these two business risks as much more important than those firms that are still in the process of considering offshoring. Hence, firms with experience in offshoring have underestimated what it takes to reach operational efficiency and achieve cross-functional synergies. The inexperienced firms underestimate how

difficult it is to reap these benefits, while the experienced have "learned the lesson".

As regards risks, that firms without offshoring experience to a greater extent see as important, nine risk factors stand out. In relation to these nine risk factors, firms that are still considering offshoring are much more 'worried' than firms with offshoring experience. It is interesting to see that most of these 'exaggerated' risk factors are associated with exogenous factors (e.g. wage inflation in offshore location) and relationships to various stakeholders (such as employees, trade unions and clients).

There seems to be a clear pattern in which firms considering offshoring are more concerned by external factors, that is, how the offshoring venture will be judged by external parties and their concomitant response. In contrast, those firms that have experience with offshoring are more concerned about internal competencies and their ability to manage third party relationships, as well as own operations. In general, these figures indicate that offshore *in*experienced firms seem to *over*estimate exogenous risks, but *under*estimate endogenous risks.

16.4 Discussion

There are several potential explanations of the observed discrepancy, or mismatch, between risk perceptions of offshore experienced and offshore *in*experienced firms. Of course, one may ask to what extent the differences are 'spurious' and not 'real'—i.e. false images due to research design fallacies. We will discuss this methodology issue later, but first we will make two suggestions to explanations of (presumed) real gaps between risk expectations and risk reality. The two explanations are complementary rather than competing and revolving around the concepts of *overconfidence* and *bounded rationality*, respectively.

16.4.1 An Overconfidence Explanation

Although risk perceptions may differ between firms, as mentioned above, our first risk gap explanation is that managers in general are *overconfident* (Levitt and March 1988) about their cross-functional coordinating skills and their capabilities of designing, drafting and enforcing contracts (Argyres and Mayer 2007) in relation to offshoring. Managers and organizational members in general, may make erroneous (positively biased) attributions of their own capabilities, and of the resulting outcomes, for well-known reasons related to social desirability of competence and of performance (Zollo 2004). Perceptions of past success encourage complacency, or satisfaction with the status quo, and therefore reduce search efforts (March and Simon 1958; Nelson and Winter 1982). Overconfidence and superstitious learning, in turn, are contingent on the extent to which managers'

perception of homogeneity of the focal business operations is in line with the true homogeneity. Whenever organizations perceive business operations within a given category (e.g. similar business operations, but in offshore locations) as very similar, they might rapidly gain confidence in their ability to deal with such a business operation (Zollo and Gottschalg 2004). To the extent that search does occur, it tends to be in the same domain, exacerbating the problem of learning myopia (Levinthal and March 1993).

In our context managers would be at risk of overconfidence in their home country—in the sense that what has been learned about how to operate various business tasks at home is wrongly believed to be applicable to conducting business in the offshore location and across borders. In this situation an offshoring firm will underestimate the knowledge gap that has to be bridged in order to conduct an offshoring operation successfully. Or put differently, the firm is overconfident about the suitability of its knowledge pool in relation to offshoring. As unexpected problems arise during the offshoring operation the firm begins to realize the misconception.

More specifically, managers tend to see the emerging offshoring venture as a tactical and relatively simple logistics operation with no corporate strategy implications. Several researchers have described offshoring as basically being an opportunistic bottom-up process (Dossani and Kenney 2003; Lewin and Peeters 2006; Maskell et al. 2007) in which the initiative to the offshoring operation is taken by operational managers and not (top) managers responsible for the formulation and implementation of the corporate strategy. In other words, the offshoring operation is not initially seen as a strategic decision. As such, the offshoring operation does not trigger development of new managerial competencies—at least not during the first stages of the offshoring operation (Jensen 2009). Only as the offshoring operation unfolds the managers do realize the operational and strategic risks, as well as the potentials for learning, that are associated with its implementation.

This explanation is in line with the common view that Scandinavian management style is promoting a relatively flat organization (Schramm-Nielsen 2004) where most operational decisions are made on a fairly decentralized level. As a result, the operational decisions are not always so well coordinated between the involved decentralized units. The implication is that most offshoring decisions from the outset are taken at a decentralized level as tactically oriented decisions with a strong focus on short term savings. It is only when these decisions are moved up to the top-management level that firms start applying a more long-term and strategic approach to offshoring where the obtained operational experiences of the firms are stored and exploited in a systematic way.

16.4.2 A Bounded Rationality Explanation

Our second, complementary explanation of the gap between risk expectations and risk reality relates to the concept of *bounded rationality* (Simon 1957; March and

Simon 1958). Managers taking offshoring decisions are—like all decision makers—subject to cognitive limitations and limited information processing capability. Therefore, they have difficulties in overlooking all the potential risks involved in offshoring—comprising the reputational risks of announcing offshoring plans (with concomitant risks of strikes or negative reactions of customers) to strategic risks of losing internal capabilities or cross-functional synergies. In this perspective managers are myopic (Levinthal and March 1993) in the way they assess risks. Hence, managers find those risks important that connect to aspects of the offshoring operation getting their attention in a particular point in time. This attitude could explain why firms considering offshoring are more focused on external factors as these have more management attention in the planning phase of the operation. Conversely, firms that are already engaged in offshoring focus more on day-to-day management problems. Although this may sound reasonable it still reflects a rather myopic perception of risks.

16.4.3 Limitations of the Study: Methodological Issues

As already indicated there are reasons to be cautious about the results and our interpretation of these. We would like to point at three methodological issues.

First—and related to the bounded rationality explanation—the gap between risk expectations and risk reality may be fictitious in so far as our survey respondents have indicated the importance of the listed risks not as a ranking of importance to the company as such, but rather in the meaning of importance to the respondent *at the moment*. In other words, the answers reflect which managerial concerns were occupying the respondent managers at the point in time when they filled in the questionnaire. This 'social constructivism' bias is, of course, somehow related to the bounded rationality explanation, but has also a methodological aspect, inasmuch as uncertainty about the respondents' interpretations of the questions throws doubt about the construct validity of the study.

Second, the apparent gap between risk expectations and risk reality may be due to the before-mentioned bottom-up decision process that often seems to characterize offshoring ventures. Our respondents are typically top- and middle-managers—mainly occupied by stakeholder policy issues, and less with operational matters. Only when these matters become critical in the later stages of offshoring do they take the attention of the managers (=respondents) as a result of the bottom-up decision process. Hence, the risks associated with exogenous factors are taking the attention of managers in the early phases of offshoring and only later on do the managers/respondents realize the serious importance of endogenous risks.

Third, we should not ignore the dynamism of international business. What used to be the most important business risks yesterday may not be so today, and this may apply for offshoring business as well. There are strong indications that the today's competitive scene is changed rapidly in the direction of firms—in their quest for achieving competitive advantage—being more focused on having good

relations to their various stakeholders. In comparison with the fine-tuning of in-house operations, reputational effects and corporate social responsibility are gaining more importance in the global competition. If this development translates to offshoring, it may very well make sense to assess external risks higher than firms experienced in offshoring used to do just a few years back.

16.5 Conclusions and Managerial Implications

Our Scandinavian data points to a clear distinction in the business risk perception of experienced versus inexperienced firms in terms of offshoring. Those firms that have experience with offshoring perceive the risks related to own operation management inadequacies—including inabilities to reap the benefits from offshoring—as the most threatening. The firms that are still in the phase of considering offshoring perceive the external risks as the most serious. This gap in the business risk perception between experienced and inexperienced firms can be explained by overconfidence in own competencies and myopic behavior, where offshoring in the outset is seen as a mainly tactical operation. Only later on, as operational problems occur, is the offshoring venture recognized as a strategic operation that requires attention from top-management.

These findings have important managerial implications—namely that managers should be cautious about having to much confidence in their offshoring operation capabilities. In addition, firms should apply a more strategic approach to offshoring from the very beginning—and not later on as the problems arise. This implies that firms might prevent subsequent operational problems by gearing the internal organization to meet the demands of an offshoring operational mode before offshoring operations begin.

Essentially, offshoring involves the transfer of value chain activities, and knowledge, from the home organization to the offshore organization (internal or external), the integration of activities and knowledge in the offshore organization, and the transfer of outcome and knowledge generated back to the home organization. Compared with a situation where all value chain activities are undertaken onshore in the home organization, operations offshore involve interfaces and interdependencies between activities in each part of the exchange between onshore and offshore units. If these interfaces are not organized optimally, the outcome will be excessive transaction, coordination and communication costs, delays and possibly poor service/product quality. However, firms can avoid or minimize these through organizational measures such as establishment of communication channels and procedures, specification of actions and responsibilities in operational processes, or even standardization of activities and manuals for personnel involved, of course depending on the nature of the activities involved. In the extreme case, modularization, if possible, is a very effective strategy for addressing problems concerning the transfer between onshore and offshore because it reduces the interface between these units to an absolute minimum.

Therefore, effective management and prevention of the operational risks of offshoring starts in the home organization before the launch of offshoring operations. Nevertheless, on the positive side, managers can avoid the offshoring fallacies of overconfidence by learning from the mistakes of offshore predecessors who, presumably, have paid fairly high learning costs.

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Part V
Industry Level and Network Perspectives on Offshoring

Chapter 17
Offshoring of Innovation: Global Innovation Networks in the Danish Biotech Industry

Stine Haakonsson

Abstract This chapter is an investigation into the internationalization of innovation in the Danish food-related biotech industry. The process of the internationalization of innovation in food and ingredients into new markets has followed a similar path: first, the companies enter new markets with their products developed in the home economy; secondly, they increasingly adjust their products to the new markets; and thirdly, some of the more high-tech companies have developed international techno-scientific networks. These companies explain the development as a strategy for 'tapping into new knowledge' by collaborating with local research facilities and suppliers. The companies engage in various constructs of global innovation networks more or less simultaneously according to the type of technology. The type of engagement and entry mode relates to the host location. Similar companies develop different network constructs. Furthermore, companies face many difficulties in organizing innovation internationally. These challenges are dealt with through either virtual or physical centres of excellence. Communication and communication tools provide a key for companies to manage these centres, and new forms of qualifications are needed to facilitate this.

Keywords Internationalization of innovation · Home-base exploiting · Home-base augmenting · Agro food industry · Biotech · Global innovation networks

S. Haakonsson (✉)
Department for Business and Politics, Copenhagen Business School,
Porcelænshaven 24, Ground Floor, 2000 Frederiksberg, Denmark
e-mail: sh.dbp@cbs.dk

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17.1 Introduction

Innovation in the Danish food industry is increasingly taking place in networks that involve many more actors than earlier innovation models found in this industry. These new network constructs involve actors such as companies, consultancies and public research institutions. Innovation networks are as such not particularly new in this industry, which has developed a strong embeddedness in the Danish national innovation system, and hence, today it represents one of the largest and most internationalized and innovative food clusters in Europe (ECO 2010). However, new actors are entering the innovation processes, and the organization of innovation in the companies is changing. Consequently, the networks are undergoing a complete reconfiguration, both in terms of the type of actors, where it previously was predominantly innovation collaboration within the value chains, that is, with suppliers and customers (Hansen 2009). In addition to this, innovation collaboration is increasingly internationalized beyond the national innovation system with mobilizing consequences for the home networks (Borrás and Haakonsson 2012).

Where the Danish food industry is perceived as well established through history, the companies are today facing organizational challenges and forms of competition which are not possible to solve on the basis of mere experience. Looking from the point of view of companies, there are three main reasons for internationalizing activities. First, the industry has developed from a small open economy (Katzenstein 1985) and needs to expand its markets in order to cover the increasing costs of innovation. Secondly, some companies produce ingredients and enzymes for global lead firms who are increasingly operating on global markets and therefore require their suppliers to adjust products to local tastes and raw materials. Finally, many companies are specialized within biotechnology for which knowledge is spread and companies need to actively create their own access to knowledge. We know from foreign direct investment (FDI) statistics that the biotech industry has the highest share of research and development (R&D)-related investment in total FDI. From 2003 to 2009, 36 % of FDI in the biotech industry was R&D related as compared to the second and third highest shares of R&D-related FDI in total FDI, namely the pharmaceutical industry (21 %) and software and IT services (7 %) (FT FDI 2009).

The aim of this chapter is to investigate the extent to which Danish lead firms internationalize innovation and how they deal with the organizational challenges that follow. Hence, the chapter analyses the internationalization of innovation in four of the largest and most knowledge-intensive Danish food companies, that is, the biotech-related food companies. All four are multinational companies (MNCs) with global market reach and have internationalized production and markets. Two of the companies are specialized in the production of ingredients and enzymes and are among the world leaders in their field. The ingredients and enzymes industries have a strong foothold in Denmark but supply ingredients to food producers globally. The other two companies are also knowledge-intensive and engaged in

R&D. However, their products are final products for direct consumption. Accordingly, this chapter will investigate how different types of companies (in different segments of the food value chain) follow different strategies in terms of organizational design in their construction of global innovation networks (GINs).

The chapter is structured as follows. The next section looks into the theoretical approaches to the internationalization of innovation. Section 17.3 is the methodology. In Sect. 17.4, there is a presentation of the Danish food industry. This is, in Sect. 17.5, followed by the analysis at the case level of the companies' restructuring into GINs. Finally, the discussion in the Conclusion takes an overall perspective on the types of innovative networks Danish food companies engage in, and how they manage them.

17.2 Global Innovation Networks Under Construction

Innovation is increasingly globalized, and today many companies are reorganizing R&D and other innovation activities through a process of constructing what have recently been coined 'GINs' (Chaminade 2009; Barnard and Chaminade 2012). These networks are encompassing many more actors than earlier innovation constructs and reach much wider geographically. The actors found in GINs are both internal and external; hence, the networks may consist of headquarters, subsidiaries, suppliers, customers, competitors, research institutions, universities and others (Ernst 2002, 2006; UNCTAD 2005, 2009; Narula 2003). Still, although operating these networks creates new opportunities to access complementary and new knowledge, reduce cost and/or engage in new markets, these networks are also very complex and costly for companies. Therefore, companies engage in GINs on ad hoc decisions based according to location specificities and company strategies (Haakonsson 2012). Moreover, as internationalization of innovation is a relatively new phenomenon, these companies operate in uncertain environments. Therefore, it is relevant to look at different ways of engagement in networks. So far, the impact of environment (Dill 1958), company specificities (Burns and Stalker 1961) and evolutionary aspects (Lewin and Volberda 1999) remains unexplored in the work on internationalization of innovation.

Most of the current approaches to internationalization of innovation stem from the strategic management of innovation. The terminology of *home-base-exploiting* and *home-base-augmenting* innovation strategies as developed by Kuemmerle (1999) relates to the competitive push and pull factors that companies experience regarding innovation (Kuemmerle 1999). Home-base-exploiting strategies imply that companies exploit their products developed at home in new markets, and this may eventually involve some development in the host location for adjusting the products to the local taste and environment. This strategy tends to dominate when companies face limited home market for their increasing expenses on R&D. This generates a push factor for companies to search for larger markets; here, emerging markets have recently entered their strategies for market expansion.

Home-base-augmenting strategies related to companies' need to tap into new knowledge or combinations of knowledge that are not available in their home settings and/or existing networks. Companies look for complementary knowledge and networks beyond their own competencies and capabilities. Although these two incentives for internationalizing innovation differ, they are not mutually exclusive and companies tend to construct networks containing a combination of the two strategies, following technology or locational specificities. The networks of innovation activities in GINs are often not established over night. They are likely to evolve from already established networks of, for example production or markets. Taking an evolutionary approach to organizations and their environments is not new as such (Lewin and Volberda 1999), but this is so far to be applied to innovation activities. One typology of internationalization of innovation in an evolutionary perspective was developed by Archibugi and Michie (1995); however, this is from a company perspective and does not take the environment into account.

Archibugi and Michie (1995) developed a descriptive taxonomy for companies' internationalization of innovation. This taxonomy includes three main categories, which are understood to emerge in successive stages (Archibugi and Iammarino 1999). The first category is *international exploitation*. International exploitation implies the marketing of nationally generated innovations beyond the company's home market, that is, through exports, licensing and offshoring of production. The second category is *global generation of innovation*. This entails corporations reorganizing their activities beyond their home economy and (re)locating R&D and other innovative activities both within the home country *and* in host countries, for example, offshoring of R&D to adjust products to local conditions. The third category is *global techno-scientific collaboration* where companies, research institutions and universities collaborate with joint scientific projects and innovation networks across countries, for example, for cutting edge innovation, such as second generation biofuels and genomics.

In reality, MNCs may engage in all three types of internationalization of innovation, and their engagement potentially differs according to different factors: intra-firm (size, products, innovations) (Meyer and Peng 2005), features in the host economy (Mudambi 2008; Graf and Mudambi 2005; Haakonsson et al. 2012) and the home country of the MNC (Edquist 2005). However, Archibugi and Michie's three types of globalization of innovation can be seen to add an evolutionary perspective to the terminology of knowledge exploitation and knowledge-augmenting strategies, as developed by Kuemmerle (1999). The companies are here expected to move from international exploitation towards global techno-scientific collaboration over time (Archibugi and Iammarino 1999). Hence, international exploitation relates to home-base-exploiting strategies, and global techno-scientific collaboration relates to home-base-augmenting strategies, while the second type of internationalization—global generation of innovation—relates to both, depending on whether the R&D relates to innovative research or the development of new products. Table 17.1 illustrates the relationship between the typology of internationalization of innovation and company innovation strategies.

Table 17.1 The links between the typology of internationalization of innovation and company strategies

Category—of internationalization of innovation	Strategy—in individual firms internationalizing innovation
International exploitation	Home-base-exploiting strategies
Global generation of innovation	
Global techno-scientific collaboration	Home-base-augmenting strategies

One result of companies engaging in the internationalization of innovation is the emergence of GINs. These vary on all three parameters, namely the global, the innovation and the networks (Chaminade 2009). On the first parameter, 'global' indicates an engagement in innovation beyond the triad (Europe, United States and Japan), and hence, companies' innovation may be more or less 'global' (see Rugman 2005; Haakonsson and Thompson 2010). MNCs may engage more or less globally (i.e. in Europe or worldwide). Secondly, internationalization of innovation spans from the exploitation of innovation through to the 'incremental' application of products to new markets by adding small alterations to products and to 'new to the world' radical innovations generated through international operations and networks. Finally, the types of networks range from instances of collaboration within the company across locations to strong external networks across the globe, involving many different types of actors both within the value chain (upstream with suppliers and downstream with buyers) and beyond the value chain (universities and scientific networks). Here, a highly networked company means that it has moved beyond its value chain.

Table 17.2 shows the three parameters which can be combined into eight different combinations from worldwide explorative relationships beyond the value chain to more local or regional exploitation of innovation in collaboration with suppliers and customers within the value chain as the two extremes. The following sections will show how the range of organizational designs related to the internationalization of innovation gets more complex and diffuse the more 'Highs' that are involved in the configuration of the innovation network of a particular company. The following sections are based on four in-depth company case studies. These explore the scope, innovativeness and scale of their respective innovation networks.

Table 17.2 Global innovation network typology (see also: Chaminade 2009; Barnard and Chaminade 2012)

	Global	Innovation	Network
High	G: Worldwide	I: Exploration	N: Beyond the value chain
Low	g: Denmark/Europe	i: Exploitation	n: Within the value chain

17.3 Methodology

This chapter is based on empirical data collected in Denmark in 2010 as a part of the EU FP7 project *Impacts of Networks, Globalisation, and their Interaction with EU Strategies* (INGINEUS). The data set consists of three main sources of information. First, the INGINEUS survey carried out in the industry in early 2010 in Denmark. The companies included in the survey are all in the food industry listed under NACE rev. 2 codes 10 (manufacture of food products) and 11 (manufacture of beverages). Companies with a minimum of five employees were selected in the initial download. The cleaned database consisted of 210 companies. Of the 210 companies that received the questionnaire, 48 companies responded to the survey. This is an overall response rate of 23 %.

Secondly, four in-depth case studies were carried out among the largest and most innovative and internationalized corporations in the industry. Hence, they constitute critical case studies and are representative of the 'cutting edge' of the emerging trends in the industry in terms of GINs. Two of the case companies are in the part of the industry relating to biotechnology, while the other two are strong international players in more traditional products. A total of 23 interviews were carried out in these four companies. Table 17.3 shows the main characteristics of the four case companies and the number and location of interviews conducted in each. In addition to the company interviews, 6 experts related to the Danish agro food industry were interviewed representing a large agro food cluster, the Ministry of Food and Agriculture, two universities and two research institutions. Due to confidentiality agreements with the case companies, their names will not be disclosed.

Finally, a search of secondary data was undertaken, including official reports, companies' annual reports, industrial associations, Ministry of Food and Ministry of Science and Technology. In addition to this, statistical data were collected from Statistics Denmark. All Danish companies are obliged to report annually to Statistics Denmark; thus, the reliability of data is high. Finally, several industry workshops and conferences related to the Agro Food Park outside Århus were attended.

Table 17.3 INGINEUS Denmark case companies' main characteristics

Company	Type of products	Market internationalization	R&D internationalization
Company I (7 interviews in Denmark, South Africa and China)	Ingredients, biotech-related	Global	Global
Company II (6 interviews in Denmark, India and China)	Ingredients, biotech-related	Global	Global
Company III (4 interviews, all in Denmark)	Beverages	Global	Denmark
Company IV (8 interviews, all in Denmark)	Dairy	Europe	Denmark

17.4 The Danish Food-Related Biotech Industry

The agro food innovation system has previously been categorized as supply driven, with an emphasis on process innovation relying on a variety of technologies from other sectoral innovation systems (Pavitt 1984). This is generally confirmed in the Danish agro food innovation system. However, new tendencies emerge in some specific technology fields of the industry, which may be explained by the coevolution with the Danish national innovation system hosting five of the largest food-related biotech companies in the world today. As a result, this industry represents various types of internationalization of innovation—or embeddedness in global innovation networks. Looking at the strategic rationale from the companies' perspectives, these can broadly be divided into two categories of internationalization of innovation: knowledge augmenting and knowledge exploiting.

The framework conditions of the Danish agro food industry are characterized by a limited home market situated in a small open economy (Katzenstein 1985). In order to cover the costs of innovation and other investments, Danish companies need to engage in international markets by exploiting their knowledge beyond the national borders. In other words, as soon as the companies reach as certain size, there is a strong push effect for Danish companies to expand beyond the domestic market and the national innovation system. This internationalization is predominantly seen within Europe (Christensen et al. 2008). Moreover, the research environment in Denmark, although highly competent, includes a limited number of researchers as compared to larger economies. Along with the development of an increasingly knowledge-intensive economy, a strong agro food innovation system has developed, which today is one of the most innovative in the world. As most food products are relatively freshly produced, with limited shelf lives, and food tastes vary considerably over geographical area, products are predominantly aimed at the Danish and European markets. The industry accounts for approximately 20 % of Danish exports, of which 64 % are sold within Europe.

The food industry is categorized in the literature as being traditional, relatively low tech and oriented towards the local market (Pavitt 1984). However, facing towards the Danish industry, this industry is currently going through a process of international restructuring—a globalization process. This is a consequence of changes in the transport sector (e.g. developing the cold chain), companies exploring new tastes beyond their home markets (e.g. for yoghurts) and innovations related to conservation (e.g. prolonging shelf life). However, a large proportion of the recent breakthrough innovations made in the Danish food industry relates to biotech-related industrial actors providing ingredient and enzyme solutions for increasingly globalized customers.

As a result, the members of one group of large companies (in this chapter represented by case Companies I and II) have developed into specialized actors within biotechnology. In this group, innovation is performed globally and there is a high degree of collaboration between a wide range of actors generating global breakthrough innovations in their specialized niche markets. In the other group of

companies in the industry, companies focus on end markets, for example, through incremental innovations, such as applying products to new markets that are either international (local tastes) or functional (the gourmet value chain, organics, healthy foods). In this part of the industry (represented by case Companies III and IV), innovation also includes, for example, applying and developing technology from other technological fields such as robotics, preservation and packaging. These actors also engage in GINs but more with the aim of sourcing new raw materials or marketing their products in new markets.

The Danish industry is highly specialized within the areas of dairy, ingredients, beer and meat. The competitiveness of the industry relates to the innovation and research intensity (Landbrugsrådet 2006). This is also facilitated by the government support in the establishment of 'clusters' in food- and agriculture-related industries, which are seen to enhance collaboration with companies, industries and public and private actors, such as the Agro Food Valley (Agrotech 2009). According to the European Cluster Observatory, Denmark has the third largest food cluster in the European Union (ECO 2010), measured by the number of people employed in the industry, and it is categorized as innovative and export-oriented as compared to other food clusters in the European Union. Moreover, the industry is highly collaborative vertically as well as horizontally (Hansen 2009). The industry has a high degree of collaboration upstream and downstream, that is, with suppliers and customers. Many companies collaborate with and perform a 'from farm-to-fork' integration of production (*Fra jord til bord*) (Hansen 2009). A large proportion of the companies are small or medium enterprises (SMEs); however, these are highly internationalized in terms of market.

The industry is innovative. At the national level, there were 3512 people employed in R&D in food in 2008. Approximately 60 % of these were in the private sector, which spent a total of DKK 2.1 billion on R&D in 2008, an increase of 28 % (from 1.6 billion) from 2007 (Ministry of Science and Technology 2010).[1] Overall, the food industry accounts for 5 % of the total private R&D spending in Danish industries. According to the Ministry of Science and Technology (2010), 246 of the Danish agro food companies carried out R&D in 2008. Ninety per cent of their R&D spending was funded by the companies themselves, 6 % was funded by other national sources and 4 % was financed by foreign actors, mainly within the European Union (ibid.).

The Danish food companies are generally export-oriented. Fifty per cent of the companies reported a significant share of their sales activity abroad, and 38 % of the companies had their largest market outside Denmark (see Table 17.4).

However, the industry is supra-regionally embedded in the European context. Of the companies with an export market as their largest market, 69 % report that their largest market is within Europe, with only 31 % reporting destinations in the rest of the world. This does not necessarily imply that these companies do not sell

[1] This is the second largest amount within the Danish industrial sectors (after DKK 5.9 billion spent in the pharmaceutical industry).

Table 17.4 Location of largest market for Danish food companies

Location of the largest market	Percent (%)
Internal to the enterprise	7.1
A regional market	14.3
Domestic market (Denmark)	40.5
An export market	38.1

Source INGINEUS Survey

Table 17.5 Source of technology for Danish food companies

The most important source of technology for the company	Percent (%)
We produce most technological inputs in-house	22.0
We buy most of our inputs from other branches of our own MNC	12.2
We buy most of our technological inputs from non-MNC firms	31.7
We buy most of our inputs from MNCs with which we are not formally connected	34.1
We buy most of our inputs from public sector organizations, for example research institutes or universities	0

Source INGINEUS Survey

beyond Europe, but that their main geographical destination of export is within Europe.

The companies engage in various collaboration constructs when exploring technology (see Table 17.5). Two-thirds of the companies rely on collaborations with other private companies as their most important source of technology. This shows the highly networked nature of the industry. One explanation for this is integration of research along their farm-to-fork value chains. Some have formed one-stop shops for customers. A current example is a consortium of five companies in the development of ice cream. This network includes suppliers of ingredients for texture and flavour, a dairy producer, a producer of machinery for ice cream production and a large ice cream manufacturer.

Summing up, the Danish food industry is an integrated innovation system based on domestically embedded knowledge and networks among different actors, of whom the majority are SMEs. The industry is innovative, and companies have a relatively high level of engagement in collaboration around and investments in innovation. In terms of market, the companies are internationalized, but predominantly within Europe. The sectoral innovation system has an international outlook and links to research beyond the national innovation system and also beyond the sectoral innovation system. Competitiveness of the food industry in Denmark is strongly related to innovation. Furthermore, the companies are embedded in the overall Danish national innovation system. Accordingly, the food industry in Denmark is a solid platform, well embedded in the national innovation system, with strong horizontal and vertical linkages.

17.5 Internationalization of Innovation, a Story of Four Large Companies

Knowledge-intensive activities increasingly take place across national boundaries and involve more external actors than before. This is particularly the case for the large companies. The four case companies are all among the most research-intensive companies in the Danish food industry. All four companies have internationalized their R&D, and their innovation activities are increasingly dispersed internationally. These companies are in a process of developing network constructs beyond market and production; they are entering and establishing GINs. As a general trend, these are constructed via company subsidiaries linking into local research environments, also in emerging economies (e.g. in Bangalore or Beijing). Most of the outsourced R&D activities carried out by the companies are kept in-house for various reasons—but the companies expressed a need and desire to link into local knowledge for two main reasons, namely exploitation and augmentation strategies.

When exploitation is used as a strategy, the companies adapt current products to local tastes, local raw materials and markets (e.g. the development of yeast for local wheat varieties in sub-Saharan Africa, or identifying the use of enzymes for pasta into new products, such as noodles). For this type of internationalization, local customers seem to be important network actors, as are locally present global customers who are important partners in the overall global innovation network of, for example, ingredient companies (i.e. for those not producing for the end consumer). At the other end, augmentation is used as a strategy to tap into knowledge the companies do not access elsewhere or which is better or cheaper in an existing setting abroad (e.g. one of the companies bought an Indian producer of surface-grown proteins). For this type of internationalization of innovation, local institutions, competitors, universities and research organizations are important actors. These two models of the internationalization of innovation are not mutually exclusive. Often both these strategies explain a company's presence in a location and are often both important elements in its location strategy. However, they have different implications for the organizational design regarding innovation processes in the companies.

To develop a more in-depth understanding of the challenges Danish food companies face and processes at play in internationalizing innovation, this chapter now analyses four of the innovation leaders. The first two companies are specialized within the biotech part of the industry. The other two produce traditional products developed in Denmark. Companies I and II are engaged internationally *in research* into breakthrough innovation within biotech-related segments of the food industry, whereas Companies III and IV are more 'traditional' in their production and predominantly engaged in *development* of their products. *Research* implies carrying out development of new products and core research. Company I and II are interested in accessing relevant knowledge actors and environments. This was expressed in the interviews as 'not all good knowledge and innovation come from

Denmark'. Hence, they are looking for supplementary skills, specialists, etc. by reorganizing R&D into 'global operations'. Projects are taken care of by the most specialized in the particular field, often spanning across R&D locations/sites. *Development* here relates to adapting existing products to new markets. Within the agro food market, there is a high degree of diversity, for example, in tastes, textures, raw produce, quality. Therefore, companies while internationalizing their markets need to engage in some development of their products with reference to local markets, local raw materials and local conditions. This relates to a market access exploitation strategy. All the case companies were engaged in development of their products for local markets. However, while this distinction may be a useful heuristic device, it should be noted that companies in either camp will do R&D to different degrees.

The remaining parts of this section look into the location and internationalization strategies of R&D and innovation at the company level in order to, in the last subsection, develop the typology further.

Company I

Knowledge is the main product of this company: delivering solutions to customers based on recipes developed by the company—including their products as ingredients. R&D is a high priority: 4.3 % of the turnover is allocated to R&D, which is carried out in five large R&D platforms plus some supplementary smaller research units. A total of 870 people work internally within R&D, of which more than 60 % have a university degree. This company has a strong need for specialized knowledge at all levels.

While researching ingredients, the company has a high level of specialization and recruits a lot of people from specialized segments of the food industry. The company's culture is designed for innovation with an emphasis on encouraging the willingness to take risks, curiosity, freedom, trust, networks, open mindedness, experimenting at all levels and supporting entrepreneurs. To facilitate the development of ideas from within the company, the company has identified *'Cre-actors'* who are internal professional consultants supporting people who have 'a good idea' in bringing it further in the company.

Research is coordinated by an internal committee ensuring that the same structure and innovation management exist across the different locations. This committee is also responsible for the allocation of funding for R&D. For research, the company needs real experts—in biotechnology. Hence, ten per cent of R&D spending is placed outside the company, often in collaboration with universities. Development takes place in close collaboration with the customers. Food tastes differ, and even for the same products, the company needs local varieties. However, having a critical mass in a centre is prioritized more than a local presence. 'Operations are specialized and we have developed a system of exchanging knowledge so that a problem in the bread industry in South America may be solved from our specialized team in Canada.' Accordingly, innovation is designed to take place among the most qualified for the technology area.

Except for one research site, the R&D centres are placed near existing production facilities. The company links to academic institutions at home and abroad through different means, for example, annual awards for world-class researchers and through websites as 'innocentive' where actors can pose a problem for solvers to investigate. At home, the company plays a very active role in the agro food cluster and has a seat on the board of the Agro Food Park in Århus. One key characteristic about the organizational design related to innovation activities is that researchers are highly mobile. The circulation of people among the different sites is high, and on this basis, the company has intentionally developed virtual centres of excellence. This implies that for each technological field, there are relevant researchers in almost all the R&D centres.

Regarding location, the company has R&D facilities in most parts of the world. China is currently a high priority location for R&D as it is an important upcoming player in biotechnology: 'They produce a number of highly qualified PhDs every year. This area is really exciting for our business. Some of our people in the United States have spent 3–6 months at the China site to help develop the company culture.' Representatives from the company in China also pointed out that 'In addition to having access to highly educated staff and first class universities, we also find a mature biotechnology network in China, which we can use to continually enhance our advantages in the fields of enzyme discovery and protein engineering' (cit. Executive Vice President). Moreover, there is some evidence that the global production network of Company I, as a configuration, developed into the global innovation network this company is a part of today. Except for a takeover of a US company, the R&D centres have been placed nearby existing production facilities, and therefore developed from exploiting to augmenting strategies related to specific locations. As a result of increased complexity, the company developed a 'Google-like' system for keeping research and laboratory information dynamic across locations.

Company II

This company is also a global leader in its field. It is research intensive, spending more than 14 % of the revenue on R&D. All R&D sites are placed in locations with significant sales and where the company can identify an interesting and well-performing research environment. R&D projects are managed internationally. Researchers are based in different sites, so that they can engage with the people in these places: 'Practically, it is easier to talk with people in Beijing if we have researchers placed there'. Today, research centres are placed in United States, Japan, Brazil, Denmark, China, Japan, Switzerland, India, UK and Australia.

For the development of products for new markets, local presence is crucial: 'sitting in Denmark, thinking about what would work for preserving juice from fruits in India may not be the most brilliant thing to do', or as formulated by a product manager for yeast: 'their (South Africa's) bread is different and has a different look, which is important to acknowledge while developing our products' (interview). Still, the company has strong embeddedness in the local environment

in Denmark: due to the long tradition for biotechnology and many important players along with their major competitors.

Over the past decades, the company has expanded their innovation activities into emerging economies. The R&D site in China was established in the mid-1990s after the company had been in the Chinese market for 23 years. Today, the company holds a strong position in the Chinese market for enzymes and has developed partnerships with local state-owned enterprises. From being a site of development—applying the company's products to the Chinese market—the R&D site has developed into being a part of the global R&D operations. Of the research carried out in China, 80 % is for the company's global R&D operations. According to a Chinese manager, there is not so much a low-cost incentive for offshoring R&D to China as a market incentive: '… costs are really not the issue. In China, salaries have increased a lot recently also because there is a shortage of qualified researchers' (interview).

In India, the company took over one of its main competitors in 2007, including their R&D facilities and, with this, 150 employees. The technology acquired is in a specialized field supplementary to their existing global competencies. Hence, the acquisition was added to the company's global product portfolio. The particular products are now only developed and produced in Bangalore but sold worldwide. In Bangalore, the company is also able to find qualified people for their global R&D activities. The Indian Institute of Science (IIS) and the Indian Institute of Technology (IIT) are very prestigious in their product area and perform world-class research: 'it is easier to tap into these resources if you have local presence'. As a result, headhunting and networking are highly interrelated, as new employees bring about new networks.

As motivations to move abroad, one manager explained that 'not all good innovation can take place in Denmark'. Competitiveness is about being present globally—and 'you look more serious if you have local R&D'. Still, the company has no plans of cutting down on its activities at home: approximately half of R&D is located in Denmark, and more people are hired there every year. However, the proportion of researchers being located in Denmark are diminishing. 'One interesting question here is whether we can find the qualified people we need in the Copenhagen area at all, which is problematic', likewise, 'it is easier to attract US personnel to North Carolina than to Denmark'.

In designing a global innovation network, this company has also developed centres of excellence. However, these are physical. Each location has its specific specialized technology area to focus on along with the overall customer service and development. This is coordinated by the headquarters, and most travelling goes between the centres of excellence and the headquarters. In order to distribute new knowledge, this company also has developed an electronic journal system covering all new inventions, their potential applicability and development.

Company III

This company has been producing the same type of products for centuries and is mainly engaged in developing different taste varieties. It is a global lead firm within its technology area which is relatively old. The overall strategy follows the intention to become the largest producer of their products globally. Hence, the company strategy relates to growth of their production and market share. Therefore, R&D focuses on products and sustainability, for example, one of the current development priorities is to keep the products fresh. However, despite a highly globalized production and market, all R&D activities are centred in Denmark, being centralized for all business lines in the headquarters. As stated by a vice president: 'Our corporate R&D focus is no longer linked to the supply chain, but to the marketing process and the end-customer'. Products are not changing radically, but a number of smaller alterations and incremental changes take place both in the production process—focusing on making the products last longer and extending the shelf life—and in marketing (targeting new customer groups, for example women).

The company has strong historical research ties with two of the largest universities in Denmark. Seven full-time internal professors within very specialized research areas are employed in the company, and there are 40 PhDs and postdoctoral staff on their pay roll. However, the PhDs and postdocs tend to move on, as was stated by the Innovation Manager: 'most of them continue their careers elsewhere—and by doing so they create a foundation for further research collaboration'. There is some internationalized research into developing the inputs in different natural environments in collaboration with local institutions, mostly in collecting samples of raw material, while the R&D is carried out in Denmark. In addition to this, there are a few specialized R&D units elsewhere, for example, one in Russia which is developing natural ingredients.

Moreover, the corporate R&D focus is no longer linked to the supply chain but to the marketing process and end customer. To facilitate this, there is a 'front-end unit' for each market in charge of identifying the needs for innovation of each brand in the particular markets. The front-end units are responsible for identifying future needs for innovation. They are also located in the HQ.

Company IV

This company's focus is in fresh products. Their R&D is focused on ingredients and nutrition and is predominantly market-oriented. Recently, the company has experienced a process of Europeanization and today has six R&D centres in Europe of which two are in Denmark and one each in Sweden, Finland, Netherlands and UK. The R&D activities are predominantly market-oriented. Due to short shelf life and market diversity, this company is not engaged globally. The company is embedded in the Danish research environment as many of the research projects involve public funding and university partners. Most knowledge is produced in Denmark. This is explained by the company as: 'Denmark has a strong tradition for agro food' and

'Danish research is very specialized, as knowledge competences at Danish universities are very good, deep and specialized in our specific areas' (interview). One example of this is how the company has been involved in some basic genome research for which it collaborates with the entire value chain of research in Denmark, from the farmers to the end consumers. Collaboration is important for their R&D set-up. In addition to the R&D facilities in Europe, the company has recently embarked on two joint ventures (in Argentina and China).

Ten to fifteen per cent of R&D expenditure is used on external cooperation. This is carried out in long-term projects with universities, for example by industrial PhDs or short-term collaborations on specific projects. At the international level, collaboration happens in relation to very specific R&D activities: 'We buy this research or knowledge in universities where we know there are special instruments, or special knowledge competences.' The company has a network of partners for this highly codified and specialized research with three to five universities in the United States, one in Germany, one in Sweden and five in Denmark. Furthermore, the company is part of an EU consortium that includes partners in France and Spain.

Internationalization of R&D is seen as a strategy of moving closer to a market—also in terms of access to the authorities for approving the products, which is a big issue for this company. For their more specialized operations, there is a lot of international downstream collaboration with clients on potential product development. In addition to this, there are a series of collaborative arrangements with specialized suppliers for product and process development.

17.6 Conclusion: Internationalization of Innovation in the Danish Food Industry

The four companies in the case studies follow two overall strategies of internationalization of R&D—home-base exploiting and home-base augmenting. Companies I and II are both engaged in offshoring innovation as a part of a knowledge-augmenting strategy. Companies III and IV are predominantly internationalizing their markets, and only to a limited extent their innovation activities. Both strategies involve some degree of internationalization or at least of scouting new trends and specialized knowledge outside the national innovation system. However, the companies are going through different restructuring processes in their organization of innovation. Although Companies I and II are globalizing innovation both as R&D, their internal network constructs are different. For Companies III and IV, the internationalization of markets is the main driver, while innovation more or less remains based on the home economy. However, these two are also tapping into very specialized and codified knowledge at a distance on an ad hoc basis also related to new markets. Depending on the scale of their market, companies tend to internationalize some *development.*

The formation of GINs implies a process of reorganizing innovation at the global level. The result is diverse network constructs ranging from knowledge-exploiting to techno-scientific networks of specialized knowledge actors for R&D. Table 17.6 shows the engagement of the four companies in terms of GINs. The capital 'G' implies that the innovation network is truly global. The lower case 'g' implies internationalization—or Europeanization—of innovation. In terms of innovation, the capital 'I' is used for companies who introduce 'new to the world' innovations coming from these networks. The lower case 'i' is used for companies predominantly engaged in incremental innovation, for example adapting products to new markets. For the network dimension, 'N' is used when companies engage in collaborations beyond their own value chain, for example, with universities and other research institutions, while the lower case 'n' indicates that the network mainly includes actors upstream and downstream in their value chains.

All four companies have strong relationships with university partners in Denmark along with companies in their value chains. Companies I and II also collaborate with foreign universities in their host locations, among other places in the United States, India and China. They are involved in techno-scientific collaborations at the global level, tapping into knowledge not readily available in their networks at home. Consequently, their innovation activities become geographically spread and localized into specialized units, what they call centres of excellence, either physical or virtual. Meanwhile, their Danish headquarters operate within all their different technology areas and coordinate the process. This calls for new methods of designing innovation processes and new qualifications needed in the home country. Whereas access to qualified technical skills is available throughout their home networks and their GINs, these companies are facing huge challenges of how to make these networks function as smoothly as possible without missing out too many opportunities.

New positions as 'Cre-Actors' or 'facilitators', even 'orchestrators', emerge within the companies in different technology fields. As shown in Borrás and Haakonsson (2012), these efforts have a highly positive and mobilizing factor in the home network. One of the companies is also engaged in the Danish Agro Food Park and collaborates with local players in this cluster, for example, in the full-package solution for ice cream, mentioned earlier. So far, neither Company I nor Company II has reduced innovation activities in Denmark alongside their globalization:

> The company needs a mix of brains and competencies from around the world and it can be difficult to attract qualified people to Denmark (Company I).
> We believe that the knowledge capital we can get in Denmark generates efficiency and new ways of organizing our work practices. As long as this comes out of the Danish system, we feel embedded here (Company II).
> We learn a lot from our networks in Denmark. There are many good partners in our clusters in Denmark and at a high international level (Company II).
> The more we engaged with diverse markets, the more we needed local solutions for local problems (Company II).

Table 17.6 Degree of global innovation network in the four case companies

Case	Global (G/g)	Innovation (I/i)	Network (N/n)	Type of GIN
Company I	5 large R&D platforms Europe, Unite States, China	New to the world 4.3 % of turnover into R&D	10 % of R&D spending outside the company	GIN
Company II	10 R&D locations spanning 5 continents	New to the world 14.3 % of turnover into R&D	Global university collaborations (China, India, UnitedStates, Europe)	GIN
Company III	R&D at headquarters in Denmark	Marketing-driven research Focus on end customer	Collaboration with European universities Cosponsoring	giN
Company IV	6 R&D centres in Europe	R&D is predominantly market-oriented	10–15 % of R&D budget spent externally Public funding	gi/IN

The four case companies have developed different ways of dealing with the coordination and communication in their different types of GINs. Companies I and II, as those mostly engaged in GINs, have both developed their own IT systems which facilitate communication across locations. These contain electronic notebooks and search machines for researchers to be able to follow other sites' research results. However, both companies report a limit to globalization: 'every time we get a new site, communication gets more complicated' (interview, Company I). Company II has closed down some of the smaller R&D sites in order to maintain a critical mass of researchers at its sites and limit communication problems. Along with this strategy, the company has established a committee which aims to steer radical innovation centrally. Along with the committee, the company has a search engine for identifying people by their competencies. This engine makes it possible to identify people across the company within certain specialized areas. Company I has a similar approach: 'The company has the intention of becoming global, but not of being everywhere' (Company I).

Research projects in Company I are generated in their *virtual centres of excellence* across sites. While presenting one of their current core research areas, a representative of the company stated: 'This project group consists of researchers from the facilities in the United States, Japan, Denmark and China—and, to a small extent, India. Five geographical sites are simultaneously working on the same assignment. The group has the critical mass of people and cultural backgrounds that are seen as necessary for success' (interview, Company I). One of the main challenges of such a model is to create an appropriate company culture. This company also expressed difficulties in creating the virtual centres in terms of

culture: 'It is difficult to export 'the Scandinavian model' to other contexts. For example, in India, failure is something that cannot be forgiven—but for us, innovation implies constant failures and mistakes. What we cannot forgive is having people doing nothing' (Company I).

Company II has a different GIN construct. This company has established *physical centres of excellence* in clusters including actors of high capabilities in certain technologies. Compared with the virtual centres of excellence in Company I, in which the researchers in each technology team need to have a high level of mobility, the physical centres of excellence in Company II require a different model of coordination and communication between the central R&D department in the headquarters and the specialized units. The network of Company I tells us about the development of strategies, where the company has first internationalized production into global production networks which were then followed by innovation activities increasingly taking place abroad, close to markets. After a while, the local subsidiaries reached a technological capability level suitable for involving in the global research teams. In Company II, the strategy has been different. Here, the technologies are decentralized into clusters and specialized research environments. Hence, the R&D is decentralized in these specialized units, and while the subsidiaries are in charge of integration into regional knowledge networks, the intra-firm coordination and communication is kept in the headquarters. This difference is illustrated in Fig. 17.1.

Meanwhile, the knowledge-exploiting companies follow a model where they maintain R&D at home. Their products are increasingly sold beyond the Danish market as the market is small. Some products are modified by small local adjustments at the local production facilities. However, these companies generally keep R&D in Denmark and to some extent in Europe. Moreover, they engage in networks beyond the value chains, but predominantly at home. For the two GIN companies, the GINs have developed within their previously established global production networks, that is, in places where they already have significant production and sales, except in certain cases where the company in question has merged with a competing company with complementary competencies, as was the case for Company I in the United States and Company II in India.

In conclusion, the food industry is a core industry in the Danish economy. The biotech-related segments of this industry are currently experiencing a restructuring, which, to varying degrees, implies the internationalization of innovation. Due to a small home economy and high investments into innovation activities, the large companies have internationalized. For companies that predominantly supply ingredients and enzymes for global food lead firms, there is a need to follow their customers in their exploitation of new markets. These companies aim at keeping their position as turn-key suppliers and to tap into all new knowledge within their fields. Hence, knowledge-augmenting strategies through the establishment of global techno-scientific collaborations dominate for these companies. Meanwhile, companies producing traditional products directly for consumers have generally little internationalization of innovation.

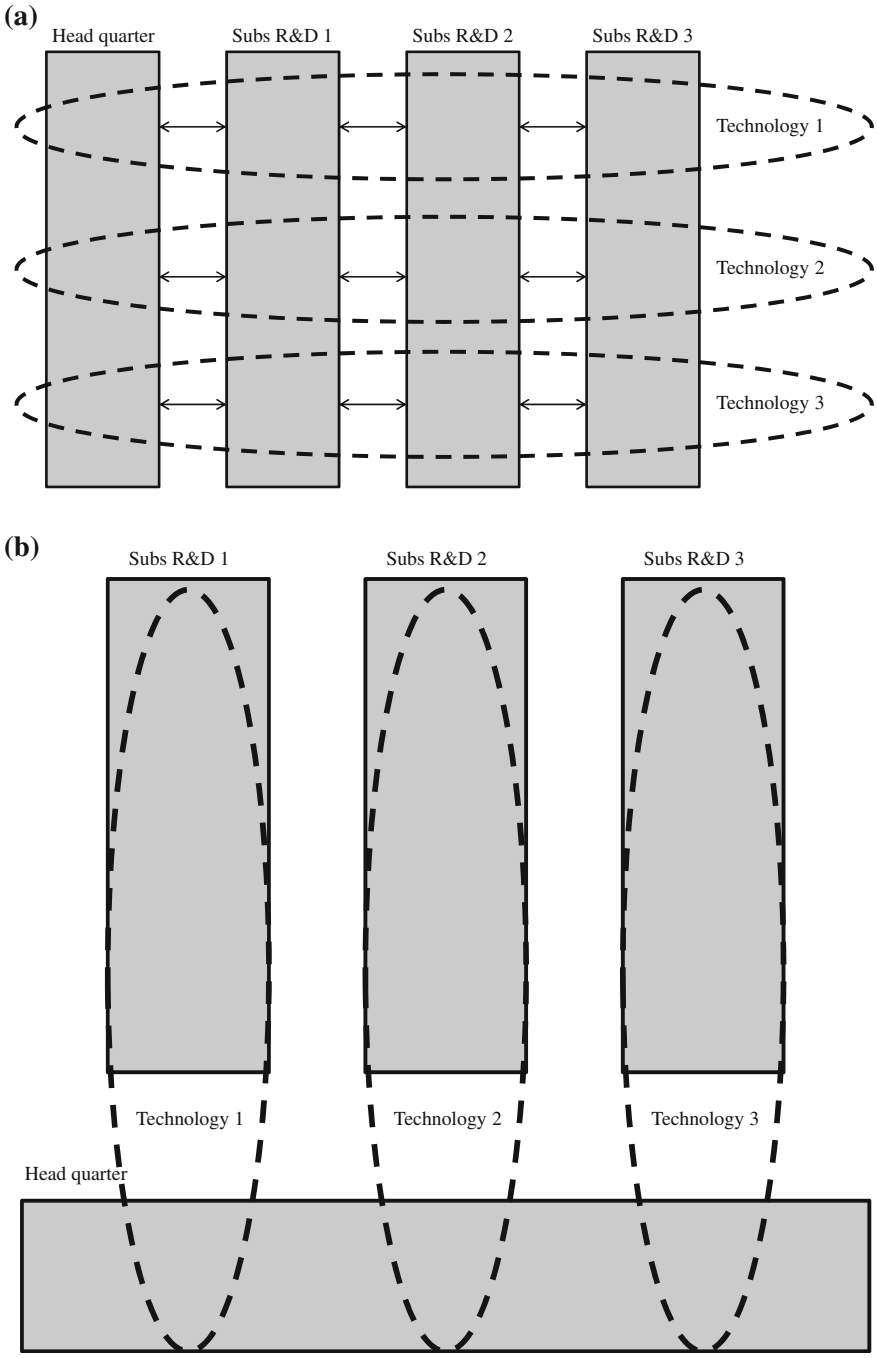

Fig. 17.1 Research-related network constructions between R&D subsidiaries and headquarters found in Company I and Company II. **a** Company I: virtual centres of excellence. **b** Company II: physical centres of excellence

The two companies with knowledge-augmenting strategies have organized their internationalization of innovation through different network constructs. One common creation is the centres of excellence. Both companies have created specialized teams for specific technology areas. However, one company uses virtually constructed centres of excellence consisting of experts around the globe. The localized experts also engage in their local external networks. The other has developed physical specialized centres of excellence in highly specialized locations. Each model requires a different form of coordination from the headquarters, why it would be relevant to look into the determinants of these two forms of organization in internationalization of innovation. For further research, insights from contingency theory into the study of complex organizations and their environments would be a potential way to research under which circumstances which network configurations appear.

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Chapter 18
Global Operations Coevolution: Hidden Effects and Responses

Dmitrij Slepniov, Brian Vejrum Wæhrens and Ebbe Gubi

Abstract Companies are actively seeking competitive advantage through their choice of location and ownership of operations. The purpose of this chapter is to uncover hidden effects of this development and propose how companies can respond to them. The chapter draws on a case study of a Danish industrial equipment firm and describes how its operations configuration has been changing over time. The chapter identifies the key determinants of this change and uncovers some of its hidden effects. The chapter closes with propositions for how to respond to these effects through the development of a distinct systemic approach to control and coordination, which emphasizes not only short-term operational efficiency, but also increasingly long-term strategic effectiveness. The findings advance coevolutionary perspectives on the integration of globally dispersed business systems spanning multiple levels of analysis and involving temporal adaptations. In terms of managerial implications, the study provides managers with lessons for designing a robust system of globally dispersed operations.

Keywords Operations configuration · Coevolution · Hidden effects · Operations capabilities · Case studies

D. Slepniov (✉) · B. V. Wæhrens
Center for Industrial Production, Aalborg University,
Fibigerstraede 10, Aalborg Oe 9220, Denmark
e-mail: ds@production.aau.dk

B. V. Wæhrens
e-mail: bvw@production.aau.dk

E. Gubi
Grundfos Management, Bjerringbro, Denmark

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18.1 Introduction

The world is changing fast and with this change emerges the need to establish a new agenda for innovative ways of organizing work. Facing intense competition, companies all over the world are seeking to achieve a higher degree of efficiency and effectiveness by constantly reconfiguring their operations networks and subsequently relocating discrete value-added activities to most appropriate destinations. This process may be confined only to crossing geographic borders and occur on an 'intrafirm' basis (i.e., offshoring). However, increasingly, in many industries (e.g., textile, footwear, IT services), it has also been accompanied by vertical disintegration of activities (i.e., outsourcing to external suppliers) (Kotabe and Murray 2004; McIvor 2009; Aron and Singh 2005; Hayes et al. 2005; Slepniov and Waehrens 2008).

It goes without saying that the idea of global dispersion of work is not new. The existing industrial networks scholarship (e.g., Ferdows 1997; Shi and Gregory 2005) provides a point of departure for understanding how global operations units are configured on a global basis and consist of diverse and interdependent affiliates (linked both through ownership and non-equity relationships), which are engaged in an exchange of goods, services, and information. Dicken (2007) points to the essential dynamism and organizational temporality of such global operations agglomerates. With the spread of offshoring and fragmentation of operations, the networks temporality and frequent reconfiguration trends are likely to continue. We argue that the constant 'process of becoming' in global operations networks poses a serious challenge and makes short-term adaptations based only on managerial intentionality inadequate for managing such a system.

Ultimately, any business process or task that can be decomposed and codified is amenable to transfer to a different location. However, how companies can effectively coordinate and control globally dispersed tasks which are embedded in differentiated and constantly changing organizational contexts remains a key unresolved question. Therefore, given these challenges for organizing operations on a global scale, this chapter explores the following research question: *what are the effects of coevolving global operations and how can companies establish fitness for global operations coevolution?*

We draw on Lewin and Volberda (1999, p. 526) definition of coevolution as 'the joint outcome of managerial intentionality, environment, and institutional effects'. In other words, the system transformation can be caused not either by managerial intervention or exogenous factors but rather by their combination. In order to account for multiple levels of analysis implied by the coevolution approach, we use the business system (Whitley 1999; Davenport 1998) and operations configuration perspectives (Srai and Gregory 2008).

The empirical part of the chapter is based on a case study of a large Danish industrial equipment company. The offshoring process has affected most parts of its value chain activities and is as such no longer confined to simple or noncore activities. This process has pushed the company into the development of more

elaborate operations strategy structures and infrastructures. The case testifies how Danish companies, which have come quite far in relocating and reconfiguring most parts of their value chain, have to deal with recursive changes in their operations system. Drawing on the experiences of the case study, the key argument of this chapter is that companies need to understand the logic, factors, and determinants of their global operations configurations, and how they change over time. Such an understanding will enhance companies' ability to build and continuously upgrade organizational capabilities, support systems, and knowledge for integrating the lead firm with the increasingly dispersed operations network.

In the rest of the chapter, we explore the effects of changing operations configurations and how companies can establish fitness for this change in order to avoid unintended dependencies on specific locations and to minimize hidden costs associated with new offshoring opportunities. The following section introduces the theoretical background of the study. We then proceed with the methods and the case study used in the chapter. Next, the analysis and discussion are presented, before we conclude with key lessons and implications for future research.

18.2 Theoretical Background

18.2.1 Business Systems and Configurations

The global business system is a rather vague concept, which has been applied at multiple levels of analysis. On the one hand, there is the economic concept of the national business system (Whitley 1999), dealing with the national institutions and environmental conditions for conducting various business processes. At the company level, the business system has been used to describe the organization, mode, and scope of operations (Normann and Ramirez 1993). And, at the operational level, the business system is often discussed as the specific tools supporting and governing operations and their development (Davenport 1998). One key dimension of the latter perspective on business system is that the business system imposes its own logic on the company, and the company often fails to reconcile the technical standards embedded in the system with its specific business needs (Davenport 1998).

From the configuration perspective, business system at the operational level can be described in terms of several variables. These variables include the number, location, and ownership of sites, the inter-facility allocation of roles and responsibilities, the nature of coordination, product range, and product composition (e.g., Colota et al. 2003; Srai and Gregory 2008).

In this chapter, the business system is discussed as a combination of these perspectives, drawing on the idea that the business system builds on a set of structural and infrastructural means, which enable the company to create, deliver, and appropriate value. This does not alone include internal resources and capabilities, but also the company's ability to deal with environmental and institutional

conditions. Therefore, the chapter will be working from the thesis that we should draw our knowledge about how to configure the global business system appropriately based on the understanding of the joint outcome of managerial intentionality and environmental effects.

18.2.2 Organizing Principles of Global Business Systems

The business system approach (Whitley 1999) focuses on the effect of factors in the institutional environment on organizations. The basic dimensions of coping with these effects are as follows: (1) coordination, that is, the mode and extent of organizational integration through common routines, systems, and management standards and (2) control, that is, the way the activities and resources are controlled within the organization.

These two dimensions are also important for determining the degree of centralization and decentralization. Prior research (e.g., Narasimhan and Carter 1989) differentiates between three major types of organizational structures: centralized, decentralized, and hybrid. Centralized structures are characterized by tight coordination and control mechanisms and decision-making authority concentrated at the top of an organization. In decentralized structures, on the other hand, decision-making authority is pushed down to the business units level making it particularly suitable for organizations with markedly different or even unique business units. In practice, however, most companies have adopted a hybrid structure that combines attributes of both centralized and decentralized form with the intention to overcome centralization–decentralization tradeoffs.

In the strategic management literature, the dimensions of control and coordination are used in defining four basic business configurations with distinctive governance forms: the multinational, the global, the international, and the transnational (Bartlett and Ghoshal 1989). The transnational mode helps companies to achieve simultaneously global efficiency of the global mode, national responsiveness of the multinational mode, and the ability to exploit knowledge emphasized in the international mode (Bartlett and Ghoshal 2002). The transnational mentality recognizes the importance of decentralization and responsiveness to cultural differences and, thus, retains national in its name. On the other hand, the transnational mentality also emphasizes linking and coordinating between globally dispersed operations, as indicated by the prefix ‘trans’.

18.2.3 Offshoring Trends and Challenges of Coevolution

In this chapter offshoring is treated as the process which arises through substituting overseas activities for domestic activities; often, it also involves a reconfiguration of the existing global operations setup. Offshoring inevitably leads to more complex and varying relationships among globally dispersed entities. With the

growth of offshoring, the move of competitive resources from intra-organizational base to the network settings is also gaining pace. As the nature of competition is changing from competition between firms to competition between networks, the firm boundary may be too narrow for defining the boundary for resource bases. According to McIvor (2009), competitive resources may be found in the network setting as companies build competitive resources that reach beyond the specific location as well as the originating organizational boundary. As a result, achieving a concerted business action becomes more challenging (Rungtusanatham et al. 2003; Sinha and Van de Ven 2005). Many of these challenges can be attributed to what we can refer as coevolutionary effects of offshoring.

Lewin and Volberda (1999) consider several essential properties of coevolution. First, these include multi levelness/embeddedness related to multiple levels, which business systems span across. Second, multidirectional causalities originate in the thesis that the lead firm and its partners in the business system coevolve with each other and with a changing environment. Third, nonlinearity emerges as a result of indeterminate paths often caused endogenously. Fourth, positive feedback or bidirectional links characterize the relationship between organizations and their environments. Fifth, path dependence influences adaptation and strategic management.

Often, though, these properties crucial for unraveling offshoring relationships are ignored which in turn leads of hidden effects of the process. There has been relatively little analysis of the extent to which companies can identify and respond to these hidden effects. In the remaining parts of the chapter, we will demonstrate that the five properties of coevolution can explain some hidden effects of operations reconfiguration. Furthermore, we will derive that some companies are likely to be better equipped for constantly changing operations configurations due to a higher level of maturity with regard to the management of their global operations. However, even in these instances, companies cannot avoid challenges and costs of coordination. Within a global operations configuration, mundane transaction costs arise when value chains are producing nonstandard products, products with integral product architectures, and products whose output is time-sensitive (Baldwin and Clark 2000).

However, these mundane costs differ depending on robustness and transferability (Grant and Gregory 1997) of the tasks in question. An operations process is robust if its sensitivity to external factors (e.g., managerial practices, infrastructure, and government requirements) is low. Transferability here refers to how easy the process can be captured, decontextualised, transmitted, and assimilated. We propose that high robustness and high transferability of operations may be required for adequate responses to undesirable effects of global operations coevolution. However, few manufacturing processes possess a sufficient robustness and transferability levels to allow for perfect mobility or a standardized organizational infrastructure, which is also supported by Clemmons and Simon (2001) in their discussion of global ERP configuration. This raises the question of configuring business systems solutions to key contingencies. Addressing this effectively means that not only the hardware of the support system has to be changed; the process also involves building organizational capability for global operations through

systems, processes, product adaptations, and preparing the organization mentally for the resulting and often radical change in focus and setup.

18.3 Methodology and Data

The primary data set for this study is derived from a case of Danish industrial equipment firm. The case was followed intensely by the authors in 2009–2011. We have interviewed COO and supply chain managers about the process, means, and strategies supporting their international operations.

The case study strategy, one of the several strategies of qualitative enquiry, has been chosen for this investigation for several reasons. First, case studies can describe, enlighten, and explain real-life phenomena that are too complex for other approaches requiring tightly structured designs or prespecified data sets (Voss 2009; Yin 2009). Second, the case study strategy is well-equipped instrumentally for furthering understanding of particular issues or concepts, which have not been deeply investigated so far (Eisenhardt 1989; Yin 2009). Third, the choice of the case study strategy is based on the fit between case research and operations management (OM) (Voss 2009), which is acknowledged but underexplored in the literature.

Despite having many advantages, case study research also has several pitfalls and poses significant challenges (e.g., Meredith 1998). First, there is the problem of the observer's perceptual and cognitive limitation. Second, a high probability of overlooking some key events also constitutes a threat to the quality of case studies research. Third, case studies are exposed to the challenge of generalizability. Fourth, the accuracy of some inferences can be undermined by the reliance on intuition and subjective interpretation of an investigator. To address these challenges, we followed practical guidelines and steps discussed in qualitative methodology literature (e.g., Yin 2009; Voss 2009). The current research relied on extensive use of triangulation. Multiple sources of evidence (semi-structured interviews, documents and on-site observations) as well as triangulation of multiple data points within each source of evidence (e.g., multiple respondents at the top and middle management levels) were used. These data combined with secondary material (annual reports, media material, presentation material to customers, and stakeholders) were used to build the database for the case.

18.3.1 Case Study: Distributed Operations at a Danish Industrial Equipment Firm

The case company is a Danish equipment manufacturer holding a market leader position. With production in twelve countries and a global sales presence, it was

working from a strong international base. The company had been acquiring approximately one production company, every year since 2000 and with these new subsidiaries, it also inherited a number of business systems, processes and product configurations. By 2011, it had incorporated more than 80 companies, spanning all time zones, 90 languages and more than 100 product families. These developments were signaling a change of mindset from an early ideology of original in-house development, tight control, and green-field investments.

Some of the newly acquired firms still controlled their own business agenda, while others were fully integrated under a corporate business system. The pace of acquisition had quickened recently in par with the restructuring of their main product's market characterized by increased concentration, and firms moving from component to system suppliers, adding more competencies. When referring to the business approach, one of the company's executives defined it as 'centrally driven global approach with a local presence'. Such an approach inevitably resulted in a highly complex business system characterized by:

- Sales and operations location diversity: Some products were produced in one factory and sold world-wide, and other products were produced in the region where they are sold.
- Components supply base diversity: Many components for local assembly were produced in one or a few factories; some components were also shared across product families.
- Multiple product/solution configurations: Sales responding to local needs and standards resulting in many potential product/solutions configurations.
- Multiple approaches to operations: Network consisted of all operations approaches from make-to-stock to engineered-to-order.
- Diverse and dynamic operations network: The global operations network was emerging with addition of new facilities many of which had their own operation conditions.

The Danish HQ had the strategic vision of establishing tighter control of foreign subsidiaries with regard to global capacity footprint, R&D, and process ownership. However, each business unit had its own budget and certain latitude to select projects, allocate resources, and responsibilities. Consequently, coordination efforts were organized in a corporate management function with a key focus on embedding a corporate culture, developing group standards and policies. But, the entrepreneurial spirit of the individual subsidiaries remained and was seen as a key driver of development and all KPIs remained related to local operations performance, resulting in what could be termed a loosely coupled global supply chain.

The company was structured around a fundamental process perspective where the interaction between Production, Product Development and the Technology Center played a special role. With Technology Centers being responsible for technology development and establishment of production lines, a certain degree of coordination was necessary to serve their two customers, namely Production and Product Development. Although the main Production hub was still based in Denmark, parts of Production had already been widely offshored, and a broad

autonomy has been granted to regional hubs. With Product Development also moving out of Denmark, it made sense that Technology Centers followed its internal customers in their global expansion. Consequently, local hubs were opened in Hungary and China, and a new hub was planned in Mexico/USA. Although there was a shared agenda at a higher level in relation to operations in different market segments, cooperation between foreign units was largely limited to brief collaboration on assignments and sharing of patents.

The economic downturn hits the company with a delay in 2009. The management group had just reported that the company seemed to be largely unaffected by the global crisis when a drastic drop in turnover happened. Afterward, it was unveiled that due to the largely decentralized reporting structure, it took more than 6 months to stop component production, from the time, it stopped to invoice the external customers. This experience taught the company a valuable lesson, namely that the loosely coupled operations network could not react swiftly to major changes on the market. To respond to this challenge, a strategic decision was made initiating global integration of Demand and Supply.

For implementing this decision, the company introduced a number of new formalization techniques and processes, which challenged the decentralized approach to the global network of facilities fulfilling demand and consolidating demand planning. An overlaying federal structure was introduced to the global network consisting of a number of business system tools:

- A new process for Integrated Demand and Supply Planning.
- New roles and changed responsibilities across the supply chain.
- New SAP modules to support the process and decision-making.
- A product segmentation according to level of demand predictability and supply chain impact.

For further coordination of strategic roles and responsibilities in the global business system these measures were introduced:

- Supply Chain focus and KPIs.
- ONE PLAN—transparent and visible to all.
- Global decision-making with local execution.

The R&D function was also in need of better coordination. The company had over 1,000 R&D staff globally, indicating that even highly complex tasks are increasingly dispersed. In the coming 5–7 years, this dispersion of activities was expected to grow further. To illustrate, the Asian hub was planned to have the same number of engineers as Denmark. This rapid growth could also be illustrated by the more than doubling of staff in China in just a year, to more than 100 engineers. Though R&D man power in China was growing fast, they had not launched any product range on their own yet, solely supporting central development activities. It was seen, however, that future responsibilities of developing products would be decentralized to a larger extent. One key driver of this was that China had a special status as a ‘second home market’ with a Managing Director reporting directly to the global board. Meanwhile, efforts were also taken to

develop the US market as its potential had traditionally been unrealized to the full extent. To illustrate, although the company introduced some product ranges over 50 years ago, it could only claim less than 10 % share in the market.

It is expected that over time, despite the introduction of measures outlined above, each regional 'Network' (Technology Center/Production/R&D) will grow increasingly independent and specialized, replicating best practices, but developing own capabilities, compatible with local culture and markets. The global organization will be nurtured through a positive iterative process by gradually increasing the level of complexity of tasks overseas. The parallel activities at different hubs of the company will continue until outposts reach critical mass or until they matured enough to absorb key competencies from headquarters or other hubs of the network.

18.4 Discussion and Implications

18.4.1 Operations Configurations Coevolution and Effects

As a point of departure to discussing the case company and its fitness for global operations, there is a need to highlight how the operations configurations of the company have been changing over time and how the overall operations configuration has been affected as a result of that. The long period of acquisitions and offshoring moves resulted in the creation of a complex loosely connected network of differentiated partners and affiliates working with a variety of business systems, processes, and product configurations. The approach led to a number of different standards for operations and a lacking ability to organize a coordinated effort across sites.

The situation is hardly can be seen as unique or specific just for this case. All companies are bound to their historical path or legacy. The long string of strategic and operational decisions related to growth through acquisitions introduced a certain path and history dependency pointing to one of the essential properties of coevolution. The development process in the case is also conditioned by such dependency rather than just a set of external conditions. It indicates that the business system cannot be configured from a clean slate to expect contingencies as any business system development initiative need to take the organizational realities and legacies into account.

Next, factors influencing operations in the case are added incrementally as new facilities are established, or acquisitions are made, new markets are opened, new technologies are added, and new suppliers seek integration. These incidences mean that the system should account for multidirectional causalities and nonlinearity, that is, two more essential properties of coevolution, challenging the mechanisms of coordination and control driven by managerial intentionality. While the operations of sites and companies may have a clear agenda and set of stakeholders, the

network of operations is not tended to; it is no-one's business. This means that the network may indeed declaratively share a common vision, but that its common focus is disintegrated by design, as each entity does not merely evolve through a series of determinate moves and decisions; they rather coevolve with their environments through often indeterminate paths.

The increased configuration complexity and its implications for business called for reengineering of the business system and its supporting structures and infrastructures. Like any other open system, the business system is designed to nurture certain capabilities, and the system is as such likely to be good at doing certain things, but does so at the expense of others. This is related to other essential properties of coevolution, multi levelness and positive feedback. Coevolutionary effects take place at multiple interconnected levels within and between firms and their environment. Ultimately, this property of the system leads to trade-offs, which have to be dealt with. The issue may, however, be solved by focusing on the possible complementarities of the system elements rather than their conflicting characteristics. We know from the field of OM that certain complementary effects can be gained from capabilities, which are often seen as conflicting (Hallgren et al. 2011). This approach has won widespread recognition as a key organizing principle for the transnational mode of operations (Bartlett and Ghoshal 1989). However, it is also recognized that governance based on these principles are difficult to operationalize in practice. So, how the company tried to respond to these difficulties?

18.4.2 Developing Adequate Responses

In terms of defining and managing a particular offshoring trajectory in the case, the company-specific task interdependency played an important role. For understanding why the case company experienced correlating offshoring trends across all major functions (i.e., Production, Product Development and Technology Centers), the particular relational density of a given set of activities is key because it defines how individual tasks are linked together. In the case company, interdependence was inherent in the task and was closely related to the structural properties of technological processes exposed to offshoring. The above perspective depicts interdependence as identifiable and relatively stable interactions. Furthermore, the interdependence here is also assumed to be amendable to coordination mechanisms, which can be set up in advance. Although this perspective provides some necessary measure for responding to offshoring challenges, it alone may be not enough.

Under the coevolutionary conditions, an increasing number of manufacturers, like the case company, are significantly reshaping their global operations configuration. Very often, such a reconfiguration is done based on partial analysis taking into account either external factors and contingencies or internal organizational realities influenced by short-term capacity and cost implications. Meanwhile, the

equally important aspects of how to combine the two and to sustain competitive positioning in the longer term get lower priority. As a result, the company struggles to utilize global operations potential or is faced with outcomes of coevolutionary effects, as the case company experienced shortly after the global economic downturn in 2009.

Circumventing these negative effects requires a conscious build-up of organizational capabilities in support of global operations; we refer to it as the build-up of fitness for global operations coevolution. First of all, it requires the emphasis on the overall system performance. Referring again to the property of multi levelness and embeddedness and echoing the system theory arguments, any open system is not just the sum of the individual parts. They interact between each other and with their environment, and these interactions should be taken into account when assessing performance effects.

Second, the effects of nonlinearity caused endogenously as a result of growing complexity of the operations system, the company tries to tackle through finding an optimum balance between centralization and decentralization. On the one hand, to compensate for slow response and the increased distance among their operations, the company introduced a more formalized form of working, which increased robustness and transferability of operations. On the other hand, putting a 'straight jacket' on the system was not seen as a remedy against all challenges and the company nurtured plans of upgrading its regional hubs and maintaining a high degree of responsiveness and sensitivity for local settings.

Third, the ownership ties that exist within the vertically integrated multinational company do not necessarily preclude the entire range of discretionary behaviors and multidirectional causalities that are possible among interacting organizations that are geographically dispersed and are exposed to indeterminate influences from their environments. Paradoxically, despite predominantly ownership-based relationships in the case, control was limited not only because some of the subsidiaries happen to be very physically distant and resource-rich, but also because they controlled critical linkages with key actors in the environment, such as suppliers and customers. Direct control originating from vertical integration was present in the case company, but its effectiveness was limited due to its coexistence with local autonomy, inherited and diverse systems, and work cultures, which were also recognized as necessary for maintaining responsiveness to various local market demands.

It is evident that the case company has developed a high level of fitness for global operations as it has come quite far with its global operations capability through cultural, systemic, and organizational development. However, the case also shows that, figuratively speaking, the company has been building the bridge while walking on it. Responding to upcoming challenges, it pushed standardization efforts, builds up an integration mechanism and initiate relations building and resource pooling to build economies of scale and scope. The case clearly demonstrated that continuous dynamics and change became inherent characteristics of the operations configurations. In this context, the old fashioned efficiency-alone-oriented global business system solutions become irrelevant. Therefore, the

company faced the challenge of developing a solution, which enabled it to achieve the optimum balance between local responsiveness and global efficiency. The efforts that the company instigated led to an increased systematization of the business system and increased awareness of processes at its various levels, namely corporate management (challenging decentralization approach e.g., through global Demand and Supply synchronization) and individual sites level (having enough autonomy for ensuring local responsiveness). The cases company carefully studied its opportunities for outsourcing parts of the operations network or otherwise extending the reach of its OM beyond the organizational boundary as a means to focus on product development, assembly, and distribution.

The institutional support was also available for establishing global operations on a site-by-site basis within the organizational context as well as facilitated by the developments in the external context. However, the case also stresses how the global business system is affected beyond just the stage of establishing individual sites or contracting with an external service or manufacturing provider. It rather emerges and as an effect of this emerging process, there seems to be a clear trajectory to the internationalization of the operations system, which at least on some levels over time gradually changes its center of gravity to offshore destinations and absorbs new roles and responsibilities in this process. Mature offshoring decisions are characterized by their move beyond the piecemeal type decisions. They rather initiate an organizational process, which accounts for systems effects and is not just about getting something produced in a specific location, but rather about orchestrating a network of interlinked activities, which raise multiple new demands on management capabilities and management systems.

18.5 Conclusion

The operations configurations coevolve over time. This in turn means that developing solutions and capabilities related to managing such coevolving global systems poses a serious challenge. Factors influencing it are added incrementally as new facilities are established or acquisitions made, new markets are opened, new technologies are added, and new suppliers seek integration. These occurrences mean that the system is in constant motion and that mechanisms of coordinating and controlling it are constantly challenged by the essential properties of the coevolutionary process: multilevelness/embeddedness, multidirectional causalities, nonlinearity, environmental influences, and path dependence.

The purpose of the chapter has been to investigate the hidden effects associated with these coevolutionary challenges and identify how companies can establish fitness for global operations coevolution. The findings of the investigation show that the traditional manufacturers are significantly reshaping their global operations configurations, including radical increase in offshore production. In spite of conscious steps toward increasing the robustness and transferability of operations activities, the case company is not seeing the context-independent manufacturing

system as a remedy for all its challenges; it rather tries to balance global efficiency with maintaining a high degree of responsiveness and sensitivity for local settings. The company needs to advance its understanding the mechanisms of its global business system as a means for making better decisions related the governance of the system. On the basis of the existing literature and the case-based example, the study identifies key determinants of the solution aimed at striking a balance between seemingly irreconcilable global efficiency and local responsiveness.

This chapter adds to the existing literature by unfolding the aspects of organizational capability required for improving the integration of globally dispersed business system and successful development of global operations configuration. The study provides managers with lessons for designing a functioning system of globally dispersed operations. These lessons are learned by doing or reveal themselves in the situation where the company fails to establish a required level of quality, fail to gain sufficient advantages from their global scope of operations or to reproduce proprietary practices at a new location. As this study demonstrated, due to the integration needs and the interdependencies between globally dispersed tasks, this challenge is persistent and reveals itself even in more experienced companies.

Among the issues for further research, we foresee the question of searching for solutions for new contingencies, which could among others contribute to the discussion of how to organize activities in order to economize on cross-border management and communication.

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Chapter 19
Transformations of Mobile Telecommunications Supplier Networks

Timo Seppälä

Abstract The aim of this chapter is to advance our understanding of changes in mobile telecommunications supplier networks by answering the following question: *how does a lead firm manage its supply networks in global supply chains?* Strategic thinking, strategic management and execution play important roles in this management process. In this chapter, I extend the existing literature on strategic thinking by analysing the strategic and operating behaviours of mobile telecommunications supplier networks composed of technology and service firms that are being influenced by the globalisation of the industry and that are operating under a strategically and operatively dominant player: a lead firm. Additionally, I analyse the strategic and operating behaviours of the mobile telecommunications suppliers in the context of two major transformations that occurred during the extraordinary growth of the mobile telecommunications industry from 2000 to 2010. The results of this chapter underscore the significance of understanding economic developments and market requirements as well as the urgency of decision-making. The results of this chapter also highlight the consequences of technology commoditisation and insufficient knowledge regarding spillovers.

Keywords Mobile telecommunications · Global supply chains · Strategic thinking · Supplier networks

T. Seppälä (✉)
ETLA, The Research Institute of the Finnish Economy,
Lönnrotinkatu 4B 00120 Helsinki, Finland
e-mail: timo.seppala@etla.fi

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19.1 Introduction

Yielding to the powers of a large player in a global supply chain can either be exhilarating or devastating. A firm in a weak position in a global supply chain may enjoy the benefits of aligning itself with a powerful entity, or it may be outperformed if it does not act prudently and fast. The stakes increase if not just a single firm but an entire global supply chain is involved.

The phenomenon of unequal power distribution in global supply chains is well documented in the management literature. For instance, supplier networks form around powerful hub companies that control key supply-chain activities and resources (Achrol 1997). Similarly, prior management studies have examined concentrated buyer power, where one customer represents major portions of an industry's revenues and growth. Even in well-established and stable industries, the effect of an imbalance of power can cause major disturbances among the subordinate supply-chain players in a short period of time (Fine 1998; Porter 2007). Usually, the weaker supply-chain players in a fast-changing business environment are targeted for acquisition, lose their businesses or slowly (and often painfully) undergo a transition into a new market.

Fine (1998) and Möller and Rajala (2007) note that one way to manage a supply-chain strategy is to control the entire supply chain and/or the entire vertical demand–supply network. However, this action cannot be undertaken by those in weak positions, especially if a supplier network relies on a single dominant firm for strategic and operational decision-making and execution. These decision-making and execution patterns in supply-chain strategies can be observed among supply-chain networks in the mobile telecommunications industry from 2000 to 2010.

This case study analysis is based on 51 qualitative interviews and several discussions with supply-chain experts who are current or former representatives of the eight case firms from the mobile telecommunications industry. The interviews were conducted between November 2007 and April 2011.

The remainder of this chapter continues as follows. The next two sections introduce the analytical framework and a research methodology related to the transformation of mobile telecommunications supplier networks and the respective case study. Section 19.4 introduces the customer and supplier perspectives of the transformation by paying particular attention to the customer–supplier relationship between the lead firms and the supplier network. The three transformations of mobile telecommunications supplier networks are then discussed in detail, and the implications of these behavioural patterns are presented. Section 19.7 discusses the next possible transformation and presents the concluding remarks.

19.2 Analytical Framework

Global supply chains have recently received considerable attention in different industry contexts and in the world in general. Global supply chains have affected not only industries but also people, corporations, the workforce and consumers. Moreover, global supply chains affect not only the corporate structures but also various types of relationships between people, including transactional, cultural and social relationships (Ali-Yrkkö et al. 2011). The global supply chain refers to the global flows of intermediate goods, materials and services. These products and services may be provided in-house or purchased from external sources that are involved in providing a product or a service for final consumption.

That said, global trade has increasingly moved away from the gross border trade of materials, goods and products—which are primarily manufactured in and distributed from one geographical location to another—to the compilation of bits of value added—where goods and products are created in many geographies, regions and countries—in the provision of materials, goods, products and services offered globally (i.e. trade in tasks) (Grossman and Rossi-Hansberg 2008; Baldwin 2006, 2009). As Grossman and Rossi-Hansberg (2008) note, the distinction between tasks and intermediate inputs is largely semantic. This transformation of global trade has been assisted by the following: the increased ease of communication, transportation and trade; drastically falling costs of collecting, storing, processing and transferring materials and digitally coded information and major political and social changes that are opening up vast input and output markets across the globe (Ali-Yrkkö et al. 2011).

With these shifts, the link between the scale/scope and the geographical and regional concentration of the provision of materials, goods, products and/or services has weakened. It has become feasible to separate tasks in time and space at a relatively fine level of aggregation. It has also become possible to understand how this separation links to corporate strategic thinking in theory and practice.

In this section of my chapter, I intend to share the theoretical framework and other information that have influenced me most in my study of the changes in the supplier networks within the mobile telecommunications industry. This theoretical framework has been relevant since the 1980s. Since then strategy scholars have increased their use of and sophistication in using economic theory, as the two following examples indicate. These strategy scholars form a community of scholars interested in strategy as a practice. However, they are also becoming interested in a broad spectrum of issues concerned with the formation and execution of strategy and strategic change in organisations (Jarzabkowski 2002; Whittington 2006).

Following the theoretical framework of strategic thinking presented in Fig. 19.1, I intend to challenge Rumelt et al. (1991). However, I also argue that both economics and strategy should recognise the contributions, limitations and opportunities presented by the other. A chief strategic officer in any firm should be able to apply this theoretical framework. In future, I hope that new directions,

priorities and ideas for the practice of strategic thinking will be unearthed by the readers of this chapter and applied to firms.

The term strategic thinking is often used widely and generically. Furthermore, this term appears to be used to denote all types of strategic thinking rather than a particular mode of thinking. Additionally, as discussed earlier, the field of strategic thinking resides at the intersection of numerous fields, including economics, strategic management and its sub-fields of strategic management, such as perspectives on corporate external environments and internal resources, as outlined in Fig. 19.1. Strategic thinking is not alone in its eclectic nature, as other sub-fields of management, such as organisational behaviour and organisational theory, similarly intersect with the fields of psychology (House and Singh 1987; Pugh 1969), sociology (Perrow 2000) and strategic management (Nag et al. 2007). Thus, every strategic thinker in any corporation has a mental model of an end-to-end system of strategic thinking and an understanding of the relationships within it. The mental model usually incorporates an understanding of both external environments and internal resources. Usually, the external environment dominates strategic thinking.

Similar to this study, past studies that have devoted attention to defining "strategic thinking" have often used a broad, seemingly all-inclusive definition, such as the one offered by Näsi (1991):

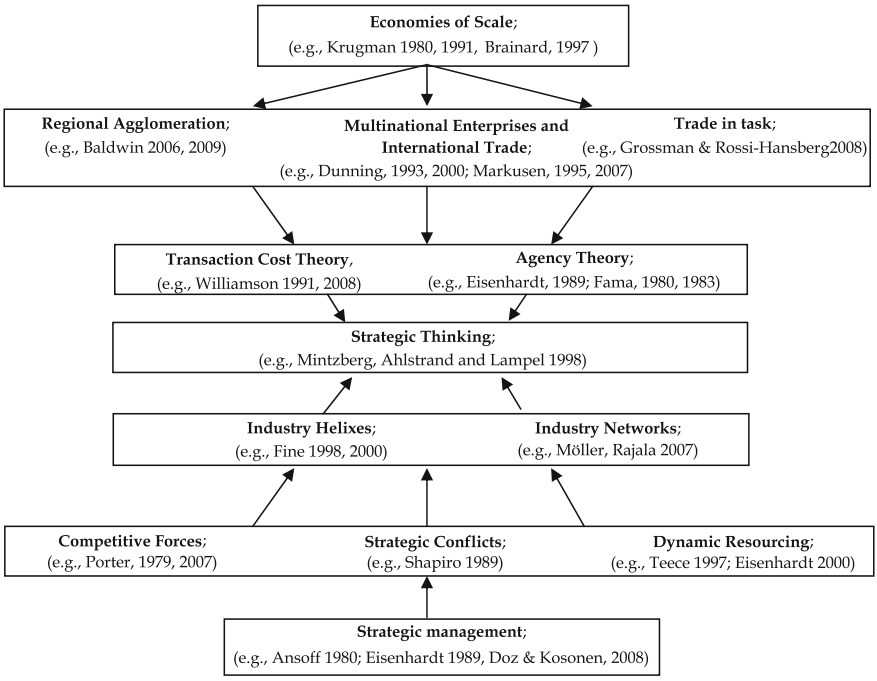

Fig. 19.1 Theories related to strategic thinking within the corporate environment

> Strategic thinking extends both to the formulation and execution of strategies by business leaders and to the strategic performance of the enterprise. In includes strategic analyses, strategic planning, organisation and control and even strategic leadership. Therefore, strategic thinking basically covers all those attributes which can be labelled strategic.

I define strategic thinking as a particular way of thinking that shares specific attributes with economics and strategic management perspectives. This particular way of thinking stems from the idea that strategic thinking emerges from a customer-driven business environment, is periodic and develops consciously and purposefully.

The unequal strategic thinking capabilities and the overload of information within industry networks and relevant supply chains, where one customer represents a major share of the business, can be problematic for firms that lack strategic thinking capabilities. Additionally, strategic management and strategy execution may become cumbersome tasks to perform. For example, Nokia's supplier network, which was marked by unequal power relations among its members, tended to depend too much on Nokia's strategic thinking and supply-chain strategies. The members of Nokia's supplier network simply followed Nokia's strategic thinking without executing their own strategic thinking in accordance with the framework presented earlier in Fig. 19.1.

Strategy is not only about change. Strategy also concerns continuity and sustainability (i.e. whether a strategy is formed as a deliberate plan to establish patterns of behaviour or as an emergent pattern by which such patterns are established). In other words, although the strategic thinking process may set out to change an organisation's direction, the resulting strategies (strategic management and execution) may stabilise the resulting direction. The theory of configuration reinforces this concept; the theory describes how the relative stability of strategy within given states is interrupted by occasional and rather dramatic leaps to new ones (Mintzberg et al. 1998, p. 302). However, the other side of the configuration school views the process as one of a rather dramatic transformation (e.g. "strategic revolution").

Many argue that organisational structure follows strategy (Chandler 1962). I argue that organisational structure is the first step towards managing and executing the selected strategy, which is a transformation driven by strategic thinking. In other words, from both the economic and business environment perspectives, organisational structure is an established view of a current business environment and is usually determined in any corporation based on the company's annual strategic planning cycles. Overall, strategic thinking is to be taken seriously.

19.3 Methodological Choices

In this section of my chapter, I will share information on conducting action research in a case study and in business, the interview guidelines, the formulation and application of these guidelines, as well as my research methodology and data

collection in action research. I will also explain my research strategies and the effectiveness of these research strategies.

19.3.1 Action Research on a Case Study

The methodology is a case study using action research. I understand and define the methodology of a case study in accordance with Yin (1989).[1] Case study research excels at clarifying complex issues, extends experiences and adds strength to the findings of previous research. The case studied in this chapter is certainly a current phenomenon and is studied in a real-life context.

In contrast, action research is a methodology that has developed incrementally in recent years. Action research is becoming an increasingly viable option for those who want to apply useful knowledge from academia to the practical world and from the practical world to academia. I understand and define action research methodology according to Reason and Bradbury (2001).[2]

However, there is confusion regarding how to integrate these methodologies. Confusion similarly surrounds the distinction between qualitative data and case study research (Eisenhardt 1989a, b, c). Typically, there is also a lack of clarity about the process of building a theory based on cases, as explained by Eisenhardt (1989a, b, c). This problem arises when integrating action research and case study methodologies.

19.3.2 Development of Interview Guidelines

I gathered information from 51 interviews and discussions with the industry experts. All of the experts are current or former representatives of the case enterprises, which include Nokia, Elcoteq, Aspocomp, Perlos, Eimo, Salcomp, Savcor, Protopaja and Laukamo. Through my interviews and discussions with these people, I was able to reflect on the transformation of Nokia's Finnish supplier network and continuously clarify my personal interpretation of this transformation. There were also a handful of industry experts who refused to participate in these interviews and discussions. The research question and the categorisation of the questions asked in the interviews are introduced in the next section. The detailed questionnaire is appended (Appendix B).

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[1] Yin writes, "It is an empirical inquiry that investigates a contemporary phenomenon within its real life context, when the boundaries between the phenomenon and context are not clearly evident, and in which multiple sources of evident are used. It is particularly useful when addressing who, why and how questions in management research."

[2] Reason and Bradbury call this methodology "a participatory, democratic process concerned with developing practical knowing in a pursuit of worthwhile human purposes, grounded in a participatory worldview."

19.3.3 Research Question

My research questions were as follows:

How does a lead firm manage its supply networks in global supply chains?

Based on this question, I continued the second half of my interviews. The questions asked were categorised as follows: What strategic thinking framework should a company apply to manage its own strategic thinking? What happened to Nokia's Finnish supplier network? Why did Nokia's Finnish suppliers fail to succeed in the global marketplace?

19.3.4 Methodology

My research is intended to observe, analyse and describe the phenomena of transformations in mobile telecommunications supplier networks from 2000 to 2010. To collect and present the most clear and reliable evidence, I accumulated notes, conducted interviews, participated in discussions and collected data as much as possible during the different stages of my research process. By ensuring that the data were collected in various ways and from different sources during the different stages, I was able to describe the transformations of Nokia's Finnish supplier network from the perspectives of Elcoteq, Aspocomp, Perlos, Eimo, Salcomp, Savcor, Protopaja and Laukamo.

In other words, I investigated a phenomenon in a real-life context while relating it to theory and seeking to understand the empirical phenomenon in theoretical terms. Based on a greater understanding of this phenomenon, I was able to construct a new theoretical framework of strategic thinking regarding corporate strategy.

19.4 Riding the Wave into a Mobile World: An Overview of the Global Mobile Phone Phenomenon from the Perspective of Nokia

The demand for mobile phones surged from 2000 to 2011, as the global penetration of these mobile phone subscriptions increased from 12 % to over 86.7 % in a short time period.[3] The most important changes were the new emerging market areas, higher product volumes, different product models, different product form factors, higher product customisation levels and lower average selling prices.

[3] Source: ITU Statistics.

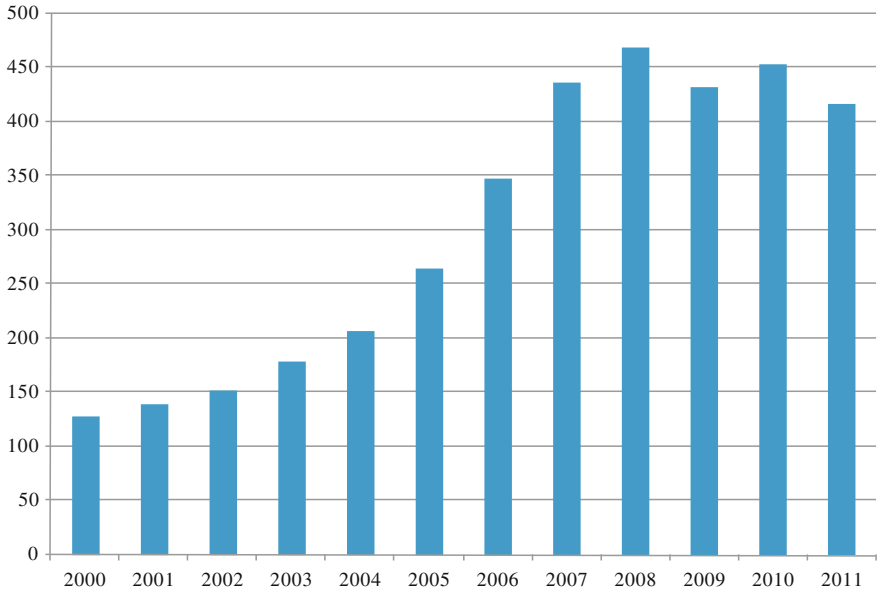

Fig. 19.2 Volume of Nokia mobile phone handsets (millions pieces) from 2000 until 2011 (*Source* ETLA database)

Based on these changes, several mobile phone manufacturers quickly began to change their supply chains by moving towards an original design and manufacturing business model. This transition has continued to this day.

Nokia mobile phone sales increased yearly throughout this period, especially in emerging markets, as outlined in Fig. 19.3. New strategic transformation initiatives were needed. These strategic initiatives then helped Nokia to meet its increasing volume requirements and the product needs of the marketplace. As shown in Fig. 19.2, the rapid growth in the volume of Nokia's mobile phone handsets sold in the markets required considerable investments in plants, machinery, competence and knowledge from not only the Finnish supplier network, but also Nokia's other suppliers.[4] The Finnish supplier network could not have singlehandedly provided all of Nokia's technologies and services. It would have been catastrophic from the perspective of Nokia's volume production if Nokia had relied solely on its Finnish supplier network. The Finnish supplier network would also have run out of capital.

The changes in product portfolios were generally apparent in the product volumes 2 years after Nokia executives made the actual decisions. For example, Nokia's reaction to the lack of products in the product portfolio in 2000 resulted in an increase in almost 300 % in the number of products in the product portfolio

[4] In the early 2000s, the Finnish supplier network represented less than 20 % of Nokia's total subcontracting.

for 2002. Another example is Nokia's reaction to its clamshell products in early 2003, which resulted in the introduction of 10 new clamshell products for the 2004 Christmas market. Although only 10 new clamshell products were added to Nokia's product portfolio during 2004, after Nokia added ten additional clamshell products and seven slider products a year later, the company's need for capacity in terms of both mechanics and assembly was almost four times greater than it was in 2003. Additionally, because Nokia did not want to invest in mechanics and assembly capacity, the company needed suppliers in addition to the Finnish suppliers to provide the industrialisation and manufacturing capacity, as shown in Tables 19.1 and 19.2.

The major changes in terms of the product volume and product portfolio compelled Nokia to begin globalising its supplier base. Nokia already had a number of non-Finnish subcontractors by the late 1990s. In the late 1990s, some Finnish suppliers decided to follow Nokia and internationalise their manufacturing operations. At the same time, Nokia began to systematically increase the number of Asian suppliers in its portfolio by including more suppliers from Taiwan, China and, later on, India. In this manner, the company almost exclusively copied the trends, integration model and direction of the computer and automotive industries and the related value chain structures (Fine 1998; Gould 2004; Yildiz et al. 2010). Moreover, in the electronics industry, the post-2000 period witnessed an intensification of the movement towards low-cost industrialisation and manufacturing locations.

The company's three transformations are based on Nokia's business strategy and the organisational changes that occurred in three distinct periods: the pre-2004 period, the 2004–2008 period and the current context (see Doz and Kosonen 2008). Nokia's supply-chain strategy followed a pattern similar to one examined by Doz and Kosonen (see Fig. 19.3).

Table 19.1 Nokia's mechanics supplier network from 2000 to 2002

Asia	Americas	Europe	Brazil
Perlos	Perlos	Perlos	Perlos
Foxconn	Triple S	Nypro	Intesys-Metacal
Eimo	Nypro	Eimo	
		Nolato	
		Balda	

Table 19.2 Nokia's outsourcing[a] supplier network from 2000 to 2002

Asia	Americas	Europe	Brazil
Elcoteq	Elcoteq	Elcoteq	In-house
GKI			
Foxconn			

[a] Firms providing printed circuit board assembly services

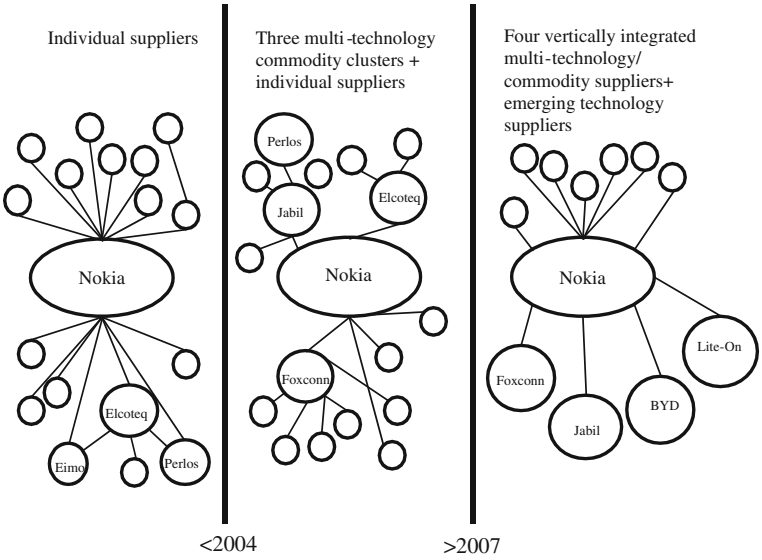

Fig. 19.3 Changes in Nokia's supply-chain strategy

Some customer–supplier relationships in which no intellectual property rights are involved can be conceived of as a game of "seduce and squeeze". First, the customer seduces his or her suppliers into investing in additional capacity or additional technologies. Second, after the suppliers have expanded their capacity and learned new technologies, the customer tightens his or her belt in a bid for lower prices and more flexible terms of his or her agreement with the suppliers in practice (i.e. the customer "squeezes" the supplier) (Fig. 19.4).

Seduce-and-squeeze behaviour often emerges in customer–supplier relationships. Some Finnish and other Western suppliers feel that Nokia utilised this tactic.

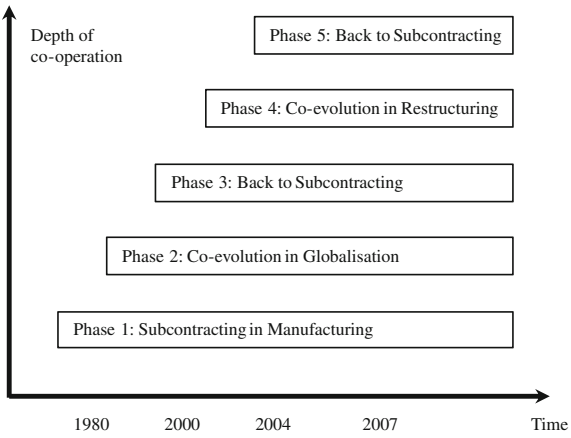

Fig. 19.4 Customer–supplier relationships in practice

This supplier management tactic is viewed as having emerged within such a short interval that these suppliers were incapable of reacting successfully to it. This problem became one of the major obstacles faced by Finnish suppliers as they attempted to address their capacity in terms of global technology, service and manufacturing and provide the flexibility needed to manage this capacity.

It appears that the Finnish suppliers lacked a proper understanding of the market's changing needs. Because of the changes in Nokia's supply network strategy and the changes driven by Asian and other competitors, the members of Nokia's Finnish network could no longer predict Nokia's business strategy as easily as they once could because Nokia was no longer communicating with its Finnish suppliers as frequently as it used to. Nokia's Finnish suppliers did not receive the special treatment that they had previously enjoyed. These changes led to uncertainty and difficulty at all levels of the organisations' strategic and operational decision-making processes.

19.5 Pre-2004 Transformation

In 1999, Nokia appointed a new head of sourcing, who will soon retire from his position as Senior Vice President of Sourcing and Procurement at Nokia. His background is in the computer industry, where original design and manufacturing (complete vertical integration) companies were the tier-one suppliers in the value chain in most cases.

During the same period, Nokia further developed its new approach to supply-chain management and began adding Asian suppliers to its supplier portfolio. Nokia's Finnish suppliers started to globalise their supply chains and manufacturing operations. By doing so, the suppliers took their first step towards becoming global players. Finnish suppliers undertook this development approximately 3 years after their American competitors and because Asian suppliers were beginning to enter the business.

> In 1999, Nokia took its first steps to internationalise their plastics and manufacturing supplier network, and the first audit of Foxconn was made. Later on that same year Foxconn became an approved supplier (*A former Nokia Sourcing Manager*).

In 2000–2002, Foxconn entered the Nokia business in the Asia–Pacific region with some mechanics[5] operations. Foxconn also started manufacturing its first printed circuit board assemblies. Through its success in these areas, Foxconn challenged Finnish suppliers and other suppliers in the Asia–Pacific region.

[5] Mechanics includes plastic (e.g., covers), metal parts and their assembly.

19.5.1 Local Services Globally

The behavioural pattern that most Finnish suppliers followed was that of internationalisation. These firms invested almost blindly in the globalisation of their own industrialisation and manufacturing operations. Initially, investing in Nokia was a profitable business because Nokia was ultimately paying the bill. However, if they did not invest in Nokia's business, the Finnish suppliers feared that they would lose all of Nokia's business. This fear of losing a profitable business became a higher risk than decreasing Nokia's share in their customer portfolios.

Typically, when Nokia began to collaborate with one of its suppliers, Nokia's message to the supplier would be clear, at least from an outsourcing perspective: that Nokia's manufacturing outsourcing was for risk management purposes and for cost efficiency and flexibility. Cost and flexibility were most important; thus, Nokia's manufacturing strategy and primary aim were to run the company's own plant at full capacity. Nokia would then outsource processes its own plants could not handle, which resulted in demand fluctuations for the company's suppliers. The strategy remained the same for years and was applied in every possible context. Nokia was and is outsourcing because of the flexibility obtained by doing so.

Until the end of 2003, most sourcing decisions were made by Nokia's regional sourcing organisations, and programmes were allocated within particular geographical regions by the organisation in each region (Doz and Kosonen 2008). Therefore, Europe-related product design and manufacturing decisions were made in Finland, decisions concerning the Asia–Pacific region were made in Hong Kong and decisions concerning North and South America were made in Dallas. As mentioned above, during the same period, Nokia introduced a more powerful global sourcing organisation, which first started as a supplier business development organisation before evolving into a real global sourcing organisation.

Nokia also introduced and began to reap cost benefits from the so-called Nokia XingWang logistics concept, which may be called the first-generation Nokia industrial park. Additionally, during this period, Nokia began to transform its supply chain by integrating global supply-chain processes and tools in a way that affected the entire value chain.

In the early 2000s, the mechanics technology segment was fragmented, and the business was divided among several different companies.

Table 19.1 presents the largest suppliers in this market segment by geographical region. The information presented in Table 19.1 was collected from different interviews. As can be seen from the table, Nokia's global mechanics supplier network was fragmented, and there was room for improvement from a risk management, cost efficiency and flexibility perspective. Brazil is treated as a separate market area because it has its own set of regulations favouring local manufacturing over imports. In that market, Intesys-Metacal dominated the mechanics technology segment in Manaus in early 2000, which was before Perlos announced its investments in 2002.

As can be observed in Table 19.2, Nokia's outsourcing policy with regard to its printed circuit board assembly services differed from its policy towards its mechanics supplier networks. Later, these networks changed significantly. To defend its market position in the Asia–Pacific region, Elcoteq acquired GKI from IBM. However, the competition tightened when Foxconn entered this business segment. Afterwards, Nokia used that firm as a price challenger in the Asia–Pacific region. In the Americas and in Europe in 2002, Nokia introduced Jabil Circuit as a new supplier in all of its outsourcing areas.

> Jabil received its first orders from Nokia in the Americas Region in 2002 and began to become a global Nokia Supplier (*A former Nokia Sourcing Manager*).

Assembly, radio frequency card manufacturing and mobile phone engine manufacturing began to play a more important role because Nokia's volume increased and because Nokia did not increase its capacity in its own plants. As Nokia's volume increased in every geographical region, outsourced volumes became increasingly attractive to other players. As a result, price competition and price erosion for the different technologies and services began to affect all geographical regions. In practice, this change meant that the Asian competitors, most of which were based in Taiwan and China, entered businesses that the Western companies used to dominate.

Eimo wanted to become the third global plastics supplier for Nokia alongside Perlos and Nypro. However, *There were too many things happening at Eimo in 2000, and we lacked experience,* said a former Eimo employee. In 2000, Eimo acquired facilities from another Finnish manufacturer, Ensto, and established manufacturing operations in Pecs (Hungary), near Elcoteq's operations. Eimo acquired a competitor, Triples S, from the US in the same year. Later on, Eimo faced great difficulties in integrating Triple S into the company.

> For the Finnish supplier network, year 2000 was already too late to enter Asia. We should have done it a couple of years earlier (*A former Eimo employee*).

Perlos, Eimo's competitor, is the only Finnish supplier that built most of its plants from scratch. That is, all of Perlos's plants around the world are similarly designed to support its core competencies and knowledge. However, in 2001, Perlos decided to expand its service and technology offerings by acquiring the Swedish antenna company Moteco AB. Moteco AB was considered an entry point into the Ericsson Mobile Phone business. Unfortunately, when Flextronics took over Ericsson Mobile Phone in 2002, the Moteco AB investment became almost worthless, especially because Nokia decided not to approve Perlos as its antenna supplier.

> Yes, we were delivering antennas to Nokia, but not directly; always through an approved Nokia antenna supplier[6] (*A former Perlos employee*).

[6] Later on, Perlos was approved as an antenna supplier.

Another Finnish company, Savcor, was more successful in its acquisitions. Savcor acquired two niche technology companies: LK Engineering, a Danish decorative etching company, and Swedecal, a Swedish flexible circuit antenna manufacturer. These acquisitions helped Savcor to maximise its value added as a one-stop shop for its customers. As a result of the Swedecal acquisition, Savcor introduced antenna technologies to its mobile phone technology portfolio. Later on, Savcor relocated the manufacturing operations of these companies to China. In addition to these acquisitions, Savcor followed Nokia by expanding to the same locations in which Nokia's in-house plants were located. For instance, Savcor invested heavily in greenfield operations by establishing units in Beijing, Fort Worth (the US), Manaus (Brazil) and Komarom (Hungary).

> We invested heavily, but after a couple of years, we noticed our technologies were replaced by other shielding technologies, and we faced restructuring (*A former Savcor employee*).

Unlike Perlos and Savcor, whose vertical technology strategy (Monteverde and Teece 1982) focused on selecting technologies related to mobile phones, Elcoteq decided to implement a horizontal service strategy that focused on services.

> In 2002, Elcoteq made a strategic decision to stay in the horizontal service model instead of the vertical service model (*A former Elcoteq employee*).

In other words, in this context, vertical integration can be described as a style of ownership and management control over several component technologies of a mobile phone. Horizontal integration can be described as a type of ownership and management control over several services throughout the life cycle of a mobile phone. Typically, both vertical and horizontal integration strategies are used by a business or corporation that seeks to sell a type of service in numerous markets over the life cycle of a product (i.e. from design to after sales).

At this point, it is clear that the firm's decision to maintain the horizontal model was unsuccessful. A potential reason for the decision was provided by a peer group analysis by Elcoteq.

> Elcoteq compared itself with the wrong peer group while deciding its new strategy. They were following what Flextronics, Solectron, Sanmina etc. were doing and not what Foxconn and similar companies were doing (*An analyst monitoring telecommunications companies*).

Based on the horizontal strategy, Elcoteq acquired most of its research and development personnel from Benefon and established the Elcoteq Design Center Oy in Salo.

> The decision to start design operations in Finland was the wrong one. We should have started either in China and/or India (*A former Elcoteq Design Center employee*).

19.5.2 Global Services Locally

Although there was pressure to globalise manufacturing operations, some suppliers refused to do so. Protopaja Oy, a small company based in Naantali, Finland, is an excellent example. A representative from Protopaja commented on the issue:

> Nokia asked us to globalise our operations. First, they asked us to come to Hungary and then to China. On both occasions, we said no. We wanted to continue operating only in Naantali [a small town located in Western Finland].

Protopaja decided to stay in Finland for obvious reasons. This decision was appropriate for the firm's technology segment because of the high capital costs of establishing new industrial and manufacturing operations. Another reason was Protopaja's ability to react immediately to customer needs, which would have been weakened in the context of multi-plant operations.

> As our company name says, our strategy has been making prototypes. We were manufacturing component prototypes for Nokia 3310, and suddenly we were investing in mass-manufacturing capabilities (*Employee of Protopaja*).

Nokia 3310 is still one of the bestselling Nokia products worldwide, with over 100 million units sold. Some other Finnish suppliers entered the mass volume business by chance because of this product, and the reason or this is simple: they were there from the start of Nokia's success, and it was easy to arrange communication channels between one Finnish company and another.

19.5.3 Global Products

In 2003, Salcomp decided to close its mobile phone charger manufacturing operations in Kemijärvi and relocate its technology and manufacturing operations to China. However, Salcomp kept its platform design for mobile phone chargers in Finland. Most of the existing Western electronics companies have their new technology platforms designed in Western countries, but industrialise their technology and manufacturing operations at lower-cost locations (Brandes et al. 2007). In practice, this strategy forces Western electronics companies to manage different supplier networks, including current business networks, business renewal networks and emerging business networks, in different ways over the different stages of technology and product life cycles (e.g. design, industrialisation and manufacturing) and after sales perspectives (Funk 2004; Möller and Rajala 2007).

19.6 2004–2008 Transformation

In autumn 2003, Nokia introduced a cluster strategy in which one fully vertically integrated company or a set of virtually integrated companies, a cluster, would be capable of supporting various part technologies and deliveries and would be located close to Nokia's manufacturing and final assembly locations. Three different technology and service clusters were named in autumn 2003: Foxconn, Jabil and Elcoteq. However, according to a former employee of Nokia, there was also another reason to change supplier networks:

> The behaviour among the Finnish suppliers, especially in the geographical region of Europe, was the main reason why vertical integration became so popular for Nokia Sourcing.

In other words, it became too expensive to manufacture parts in Europe, and it was cheaper to manufacture parts in the Asia–Pacific region and transport them to Europe.

At the beginning of 2005, Nokia announced that it would invest in an expansion of the Reynosa Plant, which led to many changes in the Americas. This investment also entailed a number of changes for both Nokia and for Nokia's supplier network in South Korea. Based on this Nokia decision, a year later, Foxconn entered the Nokia supplier network in the Americas region by promising to build a plant in Reynosa, which caused Elcoteq to lose its Americas business in 2006.

Nokia implemented the new global supply-chain model, the demand supply network strategy, by dividing its plant network into two basic categories: a low-mix/high-volume category (volume) and a high-mix/low-volume (value) category. Brazil and South Korea were treated differently. The implementation of this new global supply-chain model resulted, for example, in the closure of Elcoteq's Nokia operations in Tallinn at the end of 2006.

However, the Nokia Chennai logistics model can be called a second-generation industrial park and demand–supply-chain management model. The Nokia Chennai logistics model differs from Nokia's XingWang model. In Nokia's XingWang model, most of Nokia's supplier network is located in China, whereas in the Nokia Chennai logistics model, only a few Nokia suppliers are located in Chennai, India, with the rest remaining in China. Nokia also implemented the Nokia Chennai logistics model in Cluj-Naboca, Romania.[7] Nokia primarily used a logistics model different from its XingWang logistics model in Chennai, India and Cluj-Naboca, Romania because, from Nokia's point of view, the economies of scale for mobile phone component manufacturing were to be found in China.

In practice, this new model meant that only vertically integrated companies, such as Foxconn, the Jabil Cluster (including Perlos) and, later on, the Chinese company BYD, were invited to join Nokia's Chennai Business Park because these companies had the right vertical technologies and service portfolios to support the

[7] Nokia closes its manufacturing facility in Cluj-Naboca, Romania at the end of 2011.

technologies required for Nokia's product portfolios. All of the abovementioned clusters were included in Chennai and made it into the high-volume plant that it is today.

Before this change, the integrated mechanics and printed circuit board assembly market were divided as follows (see also Tables 19.1 and 19.2):

1. The Elcoteq Cluster (later known as the Nokia Cluster), which included Nypro and BYD;
2. The Jabil Cluster, which included Perlos and
3. The Foxconn Cluster.

BYD was under development and at the same stage at which Foxconn had been 5 years earlier. BYD was investing heavily in different technologies with the hope of becoming a genuinely vertically integrated company. Because BYD was under development, Nokia was forced to preserve some non-vertically integrated companies to support BYD's ramp-up.

Because of the vertical integration of the market, Jabil acquired Greenpoint in early 2007. This acquisition left Elcoteq as the only electronics manufacturing services (EMS) company without vertical integration in mechanics and some other technologies. These events raised the question of whether a merger between Perlos and Elcoteq was a lost business opportunity.

Based on the changes in the marketplace and because of the emerging vertical integration in Nokia's supplier base, Nokia decided to wind down its business with Elcoteq. One of the reasons Nokia did so was that Elcoteq exhibited no interest in investing in vertical integration.

19.6.1 Commodity Technology and Service Clusters

Foxconn acquired Eimo, and Jabil acquired Greenpoint. In contrast, Elcoteq did not acquire any companies. Because not everything was occurring as planned with Jabil and Elcoteq, Nokia wanted to create a competitor that would serve as an alternative to Foxconn. One former Nokia Sourcing Manager commented:

> We had one target: we wanted to create a competitor for Foxconn, another Foxconn.

From the beginning of this new relationship, BYD started making significant investments with the hope of serving Nokia in the area of mechanics technologies and deliveries worldwide. BYD also listed its operations on the Hong Kong Stock Exchange to obtain additional financing, which would allow the company to comply with Nokia's written and verbal supplier requirements.

Because of BYD's willingness to invest, Nokia introduced BYD as a second source for its product programmes, which were essentially the Foxconn programs. However, once BYD started to comply with Nokia's supplier requirements, BYD improved its performance so much that it actually became the main source for some of Nokia's product programmes. Later, the collaboration expanded to other technology areas and deliveries.

During this time period, the Elcoteq cluster was renamed the Nokia Cluster because Nokia took over the management of the cluster from Elcoteq, with all of the members of the Elcoteq cluster were returned to Nokia's normal supplier base. A former Nokia Sourcing Manager stated the following:

> BYD became another Foxconn in the end, but it took a lot of effort. It took too much effort because we did not succeed with some technologies, like mobile phone engine manufacturing.

Perlos continued without hesitation to invest in its Nokia operations because doing so was the only way to slow down Foxconn's and BYD's successes in winning additional contracts from Nokia. Perlos continued to expand its manufacturing network while remaining close to Nokia's in-house manufacturing locations. As Perlos continued to invest in Nokia as a customer, the supplier struggled with acquiring new customers. Later on, this problem became one of the key obstacles to the firm's sustainability.

> Perlos was on the brink of deciding upon one of two courses of action: it would either restructure its customer portfolio and keep Nokia happy while simultaneously investing millions in new customer acquisitions or it would find the right partner to support its vertical integration process*, said a consultant from telecommunications industry.*

Later, following Foxconn's acquisition of Eimo, Perlos was sold to the Taiwanese firm LiteOn. This acquisition provided LiteOn with immediate access to Nokia's business and volume. Following the acquisition of Perlos, LiteOn became the fourth vertically integrated company (along with Foxconn, BYD and Jabil) that supported Nokia's sourcing strategies.

According to LiteOn, Perlos was mainly acquired because of Perlos's relationship with Nokia, which provided LiteOn with access to Nokia. Other reasons included Perlos's extensive knowledge of plastics.

For Elcoteq, this event was the beginning of a significant decline in its revenue, profitability and cash flow.

> Elcoteq's decline started when we at Nokia could not make Elcoteq move towards vertical integration. We then decided to take over the Elcoteq cluster, *said a former Sourcing Manager at Nokia.*
>
> Because of our horizontal service strategy, we started to lose our manufacturing business… Every time we lost a new project, the feedback was the same: 'because you are not vertically integrated', *said a former Elcoteq employee.*

For the first time, the possibility of establishing manufacturing operations in Manaus began to attract attention. A location in Manaus, Brazil became a verbal supplier requirement because Nokia wanted all of its clusters to have a presence in locations where manufacturing for Nokia's products is done. Therefore, most of Nokia's first-tier suppliers invested in Manaus. However, Nokia later withdrew the location requirement. The firm realised that there was not enough business for every cluster.

In 2004, Balda and Lumberg Brasil acquired Intesys-Metacal together by establishing a 50–50 joint venture. In 2008, Balda acquired the entire stake in the joint venture and later closed the plant. In 2004, Nypro decided to invest in Brazil because of the opportunity it had missed by not buying Intesys-Metacal. Later, Nypro decided to withdraw from Manaus, and many other manufacturers made the same decision. During the same year, Elcoteq began its operations in Manaus as well.

19.6.2 Niche Technology and Service Companies

Savcor's niche technology strategy, which concentrated on coating technologies, drove that firm into a predicament, as new technologies were replacing its old technologies. However, Savcor emerged as a dominant player in the new technologies arena and found new business areas, such as camera modules and cosmetics, for its coating technologies.

Building on its niche technology strategy in the mobile phone business, the firm introduced another technology niche: decorating technologies.

Other companies were not as successful when changes were needed. For instance, Aspocomp, which provides services for the design and manufacture of high-tech printed circuit boards, implemented a new strategy of changing its company's focus but did not succeed.

> We warned them that their new strategy was very risky and aggressive, but it seems that they did not listen to us (*former Nokia Sourcing Manager*).

The risks proved to be real. Aspocomp's profitability began to fall, and the firm ran out of cash. For this and other reasons, the firm was forced to sell its manufacturing operations. As a result, Meadville (from Hong Kong) acquired Aspocomp India, Aspocomp China and part of the Salo operations.

What Nokia did globally was identical to what Protopaja did locally in Naantali, Finland. Although Protopaja's business with Nokia was growing, Protopaja started sharing the growth and risk with local suppliers because of the increased manufacturing volumes.

> They [Protopaja] had ten suppliers working for us under the same roof who shared all of the fixed costs. That was one of the best decisions they made. In that way, they continued to be competitive against the Asian competitors, *said a former Nokia Sourcing Manager.*

19.6.3 Current Status of the Finnish Supplier Network

Eventually, Eimo and Perlos were taken over by Asian competitors. Aspocomp sold the majority of its operations to an Asian player. Laukamo and Elcoteq were left with none of Nokia's business. For Laukamo, the loss of Nokia's business happened earlier than for Elcoteq.

In 2006, after Foxconn announced that it was building a plant in Reynosa, Mexico, Elcoteq realised that it would eventually lose its business in the Americas. For reasons that were not made public, Elcoteq did not change its strategy and did not become vertically integrated. It was apparent that there was no room in Nokia's supplier portfolio for a company that was only manufacturing mobile phone engines.

Protopaja, Salcomp and Savcor continue to be Nokia's suppliers. These three companies have demonstrated their capabilities to transform strategically and operationally during the last 10 years. One might say that this adaptability is due to their entrepreneurial mindsets at all levels of the organisations.

Protopaja is returning to its original strategy of making prototypes because there are only a handful of Nokia's product specific components still produced in mass quantities. By taking advantage of what it learned as a Nokia supplier, the company can also successfully attract new customers.

Salcomp invested in India and continues to be one of the market leaders in its technological domain. However, all of Salcomp's manufacturing operations are currently in low-cost countries, and the majority of its R&D employees are located in China. Savcor continues to invest in three mobile phone technology niches: coatings, antennas and decoration technologies. However, its global manufacturing strategy for these technologies has changed. Whereas the firm was previously close to its second-tier customers, it now offers one technology from one or two locations: antennas from Beijing, coatings from Guangzhou and Reynosa and decorations from Guangzhou and Komarum.

Savcor has succeeded in changing and has also found new business opportunities for its existing mobile phone technology portfolio.

19.7 Findings, Conclusions and Discussion

In this chapter, I examined the concept of economics, strategic management, strategic thinking and strategic agility from analytical and practical perspectives. Furthermore, I studied the integration and causality between the market changes in the industry, how these changes are translated into supply-chain strategies by a strategically and operationally dominant player in the industry network and how that dominant player has managed its industry network from 2000 to 2008. I also analysed the consequences of lacking strategic thinking and agility.

According to this study, there are six major findings, which represent both the analytical and practical perspectives, explaining why the Finnish electronics subcontracting network did not survive the transformations described and analysed above.

First, the strategic and structural changes in the mobile phone industry [i.e. the changes in local demands (cf. Fig. 19.2, p. 8), especially in the Asia–Pacific region, and global shifts in consumer behaviour] were not properly understood. One example of consumer market behaviour is the case of the clamshell phone.

The clamshell form factor is most closely associated with the mobile phone market, as Motorola used to have a trademark on the term "flip phone". However, the term "flip phone" has become generalised and is used more frequently than "clamshell" in colloquial speech. Motorola is best known for its clamshell models, such as the RAZR. The Motorola RAZR was a success, and soon after it was introduced, consumers began to request similar designs. However, Nokia adapted clamshell designs long after Motorola had introduced the concept and was in a hurry to introduce its own clamshell products. This change in Nokia's product portfolio created a need for additional technologies, which Nokia's Finnish supplier network did not have.

Second, many of Nokia's Finnish suppliers did not have the strategies and structures needed to manage their own strategic thinking (i.e. the Finnish suppliers had no comprehensive view of information related to their strategic thinking) (cf. Fig. 19.1, p. 4 and Fig. 19.3, p. 10). Furthermore, compared with their Asian competition, which engaged in war room techniques, the Finnish suppliers lacked strategic agility (Ansoff 1980). The people working in these war rooms were responsible for maintaining an up-to-date display of the key strategic and operative issues, their priorities and the status of their projects. This up-to-date display of information enabled the Asian companies to secure more business from Nokia.

Third, there was a lack of collaboration among Nokia's Finnish suppliers. All of the Finnish suppliers ran their own agendas from the beginning to the end of their business relationships with Nokia. After the end of the 1990s, they did not enter real discussions about merger. Although there were some discussions among Elcoteq, Aspocomp and Perlos and eventually between Aspocomp and Perlos, the first attempts at collaboration failed because of the arrogant behaviour of some of the owners of these companies. During the second series of attempts, the discussions failed because of the differences in the actual companies' valuations. Additionally, there were no interested private investors or available funds to finance mergers among these companies.

Fourth, Nokia's Finnish suppliers were running out of financial capital. The changes in Nokia's sales volumes (cf. Fig. 19.2, p. 8) and product portfolio required a great amount of financial capital. Ultimately, none of Nokia's Finnish suppliers had enough financial capital to move ahead on their own in adding additional customers, technologies, services or products to their portfolios. Additionally, the suppliers could not add production capacity or make the correct types of acquisitions. Usually, suppliers running out of financial capital in a fast-changing business environment are targeted for acquisition, lose their businesses, or slowly and often painfully undergo a transformation into a new market.

Fifth, Nokia's Finnish suppliers lacked global brand recognition. None of the enterprises had a globally recognised brand to attract new customers. Typically, a global brand has several advantages, including an association with status and prestige and the capability of achieving maximum market impact while reducing marketing costs. If a company seeks to globalise its brand, that brand will be of greater value to the company than a local or regional brand. The value measured by expected profits and new customer engagements is completely linked with the

intentions of future purchaser (i.e. the customer) and the company's global strategic plans for the brand (Motameni and Shahrokhi 1998). In reality, most of the Finnish suppliers were unknown in the global marketplace. Additionally, the fact that they had Nokia in their customer portfolios and played such an important role was seen as a great risk.

Finally, technology commoditisation happened faster then expected in the mobile phone industry. The depreciation schedules for enterprise fixed assets are quite long and range from 3 to 10 years. Facing fierce short-term price competition, Nokia's Finnish suppliers were not capable of managing their assets quickly enough, as technologies were *commoditising while new suppliers were entering the game.*

These findings do not explicitly explain why Nokia's Finnish suppliers did not survive in the global marketplace. There were many other reasons as well. I personally consider these six findings to be the most important ones.

These above-mentioned findings, which are both analytical and practical, contrast with and contribute to past research in the economics, strategic thinking, strategic management and strategic agility literatures.

First, the strategic management and economics literatures (Rumelt et al. 1991) have found that economics and strategic management are related and linked by transaction cost economics, agency theory, game theory and evolutionary economics. Based on my view, Fig. 2.1 introduces a holistic relationship and integration model that is relevant to this case and that sits at the intersection of economics and strategic management.

Rumelt et al. (1991) argue that economic thought is reshaping strategic management. However, I argue that the strategic and operative management behaviour of different multinational enterprises is creating trends, theories and behaviours driven by economics.

Second, the strategic thinking and management literature states that when working globally in close collaboration with a dominant global value chain player, firms' strategies arise unexpectedly instead of deliberately (Drucker 1970; Porter 1980; Mintzberg 1994, 2007). Nokia's Finnish supplier network tried to work with deliberate strategies, but these firms failed to successfully implement these strategies. How can such an unequal power distribution be balanced in a global value chain? There is no clear answer. However, I argue that Nokia's Finnish supplier network, specifically the multinational enterprises, lacked access to the additional stakeholders and resources that would have enabled the suppliers to break out of their existing business structures.

Third, the strategic agility literature (Ansoff 1980; Eisenhardt 1989a, b, c; Teece 1997; Doz and Kosonen 2008) not only addresses firm-level strategic agility but also examines global value chain agility. To manage strategic agility in a global value/supply-chain environment, a firm needs different types of business networks (current business networks, business renewal networks and emerging business networks) to enable fast turnover in an agile manner (Möller and Rajala 2007). Nokia's Finnish supplier network was part of Nokia's current business network but was not a part of its other networks.

In addition to contributing to the literature, these findings offer implications for management and strategic thinking practices in any corporation.

In the following section, I share major findings related to three other topics and explore future research opportunities. These three findings are structural changes within the global value chain, technology commoditisation and knowledge spill-overs in industries, enterprises and individuals. I finalise this section with a discussion and with my parting thoughts on Nokia's next transformation.

19.7.1 Structural Changes Within the Global Value Chain

On the one hand, scale economies promote complete industry value chains or the establishment of certain parts of a value chain at one location, from which intermediate and final products are shipped to customers. On the other hand, transportation costs and customer service commitments drive firms to establish their value chains in locations close to their consumers. These opposing forces drive the decision-making processes within the different value chains of different industries. Furthermore, as shown by the case of Nokia, these same forces drive the decision-making process of any dominant player with regard to the proximity of its manufacturing centres to its consumers, especially if the company is a manufacturer of consumer products.

Based on design, industrialisation and manufacturing proximity to consumers and markets, this regional industry value chain agglomeration or partial industry value chain agglomeration usually increases speed, salience and clarity. Thus, the process helps firms and their supply chains to execute continuous, pervasive and incremental operational improvements in an efficient and centralised fashion.

Changes in local demand and consumer behaviour have operated as key drivers of the transition from Finnish (European) subcontracting networks to Chinese subcontracting networks. Thus, most of the value added to the Finnish economy, including the design of the product, the industrialisation of the product and its manufacturing process, the manufacturing of the product and other services provided by the Finnish electronics subcontracting network, have been partly transferred to China and to various electronics industrial parks in low-cost locations around the world. However, much value-added work is still conducted in Finland.

19.7.2 Technology Commoditisation

History has shown that all industries will mature, all businesses will become saturated, and all technologies, services and products will become commodities (Dunning 1993; Markusen 1995; Blinder 2006). In the Finnish electronics industry, where everything was "high-tech" in the late 1990s and early 2000s, many of these items have become commodities. Conversely, it can be said that

Finnish suppliers have been unable to renew and restructure their businesses and that their strategic and operative thinking has not kept pace with market requirements.

In practice, this change began to emerge in 1999, when Nokia established its product creation centre in Beijing, China, where manufacturing was already occurring. The initial purpose of this product creation centre and manufacturing unit was to expand Nokia's ability to develop, localise and deliver the company's mobile phones in China and the Asia–Pacific region. Today, the Beijing product creation centre and manufacturing operations represent the key product creation centre and manufacturing unit that designs, industrialises, manufactures and delivers mobile phones to the global markets (Hariharan 2005).

> The first Beijing product creation centre product program in 2001 was a facelift program for the Nokia 3310… the first complete product program was another product in 2002 specifically for the Chinese market… the first complete product family was another set of products in 2006. For the first time, the product was for global delivery *said a former Nokia Employee.*

In sum, knowledge and technology transfers take years to complete. It took 7 years to establish a product creation centre in Beijing that was capable of designing products featuring mature technology and delivering them to global markets.

Nokia's Finnish supplier network was not part of this development at the Nokia Beijing product creation centre. Instead, the Asian competitors became well established and are currently supporting Nokia in Beijing.

19.7.3 Knowledge Spillovers Among Industries, Enterprises and Individuals

If a firm is to strategically transform and change, attracting talent and experience from other industries and businesses is of the utmost importance (Cappelli 2008). This capability has been one of the key drivers of success for many Finnish companies, including Nokia, Nokia Siemens Networks, UPM, Kone and Konecranes.

The mobility of the top management between industries and businesses allows enterprises to transform and position themselves according to the requirements set by other industries and competing firms. Therefore, management mobility is an important channel of knowledge spillovers.

According to Boeker (1997), the central argument for management mobility is that the movement of top managers between organisations enables the information and insights obtained from these managers' prior experience to influence the strategic decisions at the focal firm. In contrast, Sorenssen (1999) argues that the strategic implication of management mobility is that the firm must attend not only

to its positioning in the product and/or service markets but also to its positioning in the factor markets, particularly the market for management talent.

Nokia's Finnish suppliers did not engage in management mobility, whereas their Asian competitors did. The Asian competitors consistently pursued the best available agents of strategic change, but Nokia's Finnish supplier network relied solely on Finnish management resources.

In addition to management mobility, knowledge spillovers happen in several other forms: research and development spillovers by patent citations (Jaffe et al. 1993), technology transfer and spillovers deriving from ownership sharing of foreign multinational affiliates (Blomström and Kokko 1998; Blomström and Sjöholm 1999) and talent management at all levels of an organisation (Cappelli 2008).

Offshoring and outsourcing phenomena encourage the migration of impersonal technology, service and manufacturing jobs to low-cost locations to minimise the cost of technology, service and product ownership. However, jobs in which personal or face-to-face contact is either imperative or highly desirable remain in locations close to customers and consumers. These opposing forces drive the decision-making process in society and business with respect to the locations of current and future jobs (Blinder 2006).

19.7.4 Parting Thoughts on Nokia's Next Transformation

In my opinion, this recession and the following period represent a golden opportunity for Nokia to not only restructure its global supply chain and the different tasks related to product life cycle but also reselect its outsourcing subcontractors and its overall supplier portfolio.

Furthermore, the recent changes and volatility in exchange rates, such as the US Dollar versus the EURO, the Japanese YEN versus the EURO and the potentially unexpected changes in future Chinese currency policy, have raised the question of whether it is too risky to continue encouraging multinational enterprises to further invest in China or to consider new locations (i.e. perhaps the company should consider transferring its production back to Europe). This represents another potential driver of another supply-chain transformation at Nokia.

In addition to the above, I believe that Nokia will move further towards an exclusively original design manufacturer (ODM)-oriented business model. That is, some additional manufacturing assets and machinery may be sold to newly selected outsourcing partners, as Nokia did with its software assets, but only time will tell whether this prediction will become a reality.

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Part VI
Exploring New Theoretical Approaches in Offshoring Research

Chapter 20
Broadening the Conceptual and Phenomenological Scope of Offshoring

Susan M. Mudambi and Jonathan Doh

Abstract Offshoring is an important economic and social phenomenon that is not confined to the firm-to-firm relationships emphasized in the management and international business literatures. Global sourcing strategic relationships also exist between firms, governments, and non-governmental organizations, and merit a re-examination of the phenomenological and conceptual scope of offshoring. We identify some contrasting assumptions about the roles and responsibilities of different actors in the global business environment, and offer some "provocations" designed to stimulate the rethinking of offshoring within the emerging global social and economic environment.

Keywords Offshoring · Government sourcing · Non-governmental organizations · Stakeholders

20.1 Introduction

Offshoring captured the attention of the general public and policy makers at the turn of the new century because it was presented as a "big idea" that challenged assumptions about the boundaries of the firm, the value of human capital, and the

S. M. Mudambi (✉)
Department of Marketing and Supply Chain Management, Fox School of Business, Temple University, 524 Alter Hall, 1801 Liacouras Walk, Philadelphia PA 19122, United States
e-mail: susan.mudambi@temple.edu

J. Doh
Villanova University, Bartley Hall Rm 2079, Management, 800 Lancaster Avenue, Villanova PA 19085, United States
e-mail: jonathan.doh@villanova.edu

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separability of business processes. Unfortunately, some academic discussions of offshoring definitions and details have obscured the view of the big picture. Offshoring is an important economic and social phenomenon that is not confined to the firm-to-firm relationships emphasized in the management and international business literatures. An overly narrow focus on the exchanges between relatively sophisticated multinational corporations has limited the potential conceptual and phenomenological development of offshoring and its application to a broader set of circumstances and practices. In this chapter, we argue that the phenomenon of offshoring is much broader than what has been considered in the literature to date. Global sourcing strategic relationships also exist between firms, governments, and non-governmental organizations, and merit a re-examination of the phenomenological and conceptual scope of offshoring. We propose new research directions that capture this wide scope and suggest specific avenues for promising investigations that recognize the breadth and depth of offshoring and its relevance to a range of social science theories and approaches.

The chapter is organized as follows. In the next section, we review conventional definitions of offshoring and argue why such definitions are incomplete. We then discuss and distinguish between the phenomenological and conceptual scope of offshoring, as a first step to re-conceptualize offshoring to incorporate new modes and mechanisms. We then describe contrasting assumptions about the roles and responsibilities of different actors in the global business environment, and offer some "provocations" designed to stimulate the rethinking of offshoring within the emerging global social and economic environment.

20.2 Conventional Definitions of Offshoring

The term *offshoring* typically refers to a domestic for-profit company's decision to obtain products or services from a foreign-based company instead of continuing to source the products or services internally and locally (Lewin et al. 2009). The term *captive offshoring* or international in-sourcing applies when the foreign-based company is a subsidiary of the focal firm, and the term *offshored outsourcing* refers to the practice when an independent or third-party provider is utilized. Considerable space in academic publications (and much time at academic conferences) has been dedicated to exploring these definitional distinctions and adding new extensions such as "near-shoring," "in-shoring," and "far-shoring." There are also examples of "reverse" or "boomerang" offshoring, such as a U.S. firm sourcing software development to Infosys, with the work performed in California by Indian H-1 visa holders.

The definitional extensions have not been able to mollify skeptics who continue to ask what is new? Critics ask how offshoring decisions and practices are conceptually different from the "old-school" international business topics of sourcing and logistics, foreign direct investment, and joint ventures and alliances. They also wonder what theoretical perspectives are required beyond standard

conceptualizations of internationalization, internalization, the international product (or service) life cycle, etc. These are fair questions with no simple answers. One relevant approach is to examine each theory and research framework and analyze how each can be applied to offshoring (Bunyaratavej et al. 2011). These efforts should continue until a clear conceptualization is developed.

20.3 Broadening the Scope of Offshoring

In this chapter, however, we advocate a substantial broadening of the conceptual and phenomenological scope of offshoring. We attempt to frame a bigger picture using a wide-angle lens. To start, there are other relationships that conceptually fall under the heading of offshoring, and we use current examples to re-examine the nature and implications of offshoring. In particular, offshoring theory can and should be extended to the sourcing relationships of all multinational organizations, not just multinational firms. Sourcing relationships take place between government and firms, government and non-governmental organizations (NGOs), and firms and NGOs. This messy reality of offshoring has even messier theoretical implications.

Management theory has long argued that an organization's mission, values, organizational culture, structure, and processes matter. If the boundary blurs between two organizations that are very similar along these dimensions, it may generate headlines and rhetoric, but can be seen as business as usual, with no strong or enduring theoretical challenges. It can be argued that this describes the situation of offshoring between multinational firms, with information technology enabling the offshoring of business services in the same way that transportation and communication improvements enabled the offshoring of manufacturing.

However, boundary blurring between two organizations with very different missions, values, and incentives raises theoretical issues as well as eyebrows. The differences between firms, governments, and NGOs are real and relevant. Significant differences in missions, values, and incentives among offshoring partners may also lead to troubling unintended consequences.

Even if the entities share an objective such as cost reduction or service improvement, existing theory on offshoring does not lead to an expectation of offshoring effectiveness. Should scholars interested in the global sourcing of firms pay attention to sourcing relationships of governments and NGOs? Given the size and scope of these arrangements, an examination beyond the firm-to-firm comfort zone has the potential to cast new light on the complexities of global sourcing.

To this point, despite an extensive literature on government contracting, there has been little analysis of government contracting to offshore subcontractors. National, state, and local governments are increasingly offshoring IT and healthcare services. For example, in 2010, the U.S. state of Missouri awarded a nine-year $407 million contract to India-based Wipro for the outsourcing of healthcare services (Basu 2011). In the area of defense, the U.S. Department of Defense

sources some security services to U.S.-based contractors, who then subcontract to a non-U.S. firm that is located offshore. In late 2009, there were more U.S. citizens in Iraq working for private security companies and related services than were serving in the armed services, raising many ethical and legal issues and concerns (Elms and Phillips 2009).

Governments also offshore activities to NGOs. In particular, international development aid is often outsourced by donor governments to NGOs, rather than to recipient governments. These practices are not new (Lancaster 2000, p. 10). Characterized funding through NGOs as an important part of the assistance allocated for development purposes, noting that the United States Agency for International Development (USAID) estimated that about a third of the nearly $2 billion development assistance funds are implemented by NGOs. The percentage of aid that is funneled through NGOs, however, is growing. In the 1970s, approximately 70 % of resource flows from the United States to the developing world were from official development assistance and 3 % were private. In 2003, direct government assistance comprised just 15 % of $102.5 billion in resource flows, with 85 % coming from non-governmental resources, of which 45 % was private capital flows, 15 % NGO assistance, and 25 % personal remittances (USAID 2006). For example, instead of delivering emergency services itself or directly providing financial assistance to foreign governments, USAID sometimes relies on the UK-based NGO Oxfam for the provision of emergency food aid, and utilizes the France-based NGO Medicines Sans Frontiers for medical services. The governments of Bangladesh and Haiti rely heavily on NGOs for essential health and education services, using a mixture of local and foreign personnel.

In this environment, many NGOs have evolved into sophisticated multinational enterprises. Although there has been academic interest in the role of non-governmental organizations as important global organizations that create value for stakeholders (Doh and Teegen 2002; Teegen et al. 2004), the theoretical and practical implications of NGO global sourcing strategy have not been examined. NGOs source services to foreign subsidiaries, and source services to non-affiliated foreign NGOs, and have sourcing relationships with firms and governments. Similar to MNCs, global NGOs involved in relief and development, environmental protection, and poverty alleviation face cost pressures and difficulties in finding qualified workers. This merits a deeper examination of the nature of offshoring and challenges some of the assumptions associated with classic MNC examples, such as a UK firm offshoring IT services to a firm in India.

In addition to sourcing relationships between governments and NGOs, a rise in collaborations between firms and NGOs (Doh and Guay 2004) indicates that private companies increasingly source services from NGOs—many in foreign countries—in order to complement their capabilities and resources (Boddewyn and Doh 2011). In particular, the economic recession of the early 2000s, the continued retrenchment of governments from their traditional social welfare responsibilities, and responses to the collapse of global financial institutions in 2008 and 2009 prompted a further blurring of the lines between public and private enterprise and

raised questions over what are core governmental functions, what can be outsourced and offshored, and what cannot.

The Global Development Alliance, for example, which was pioneered by the United States Agency for International Development (USAID), brought together partners from 339 multinational enterprises and 89 NGOs and foundations to form a growing network of approximately 290 public–private alliances for the purpose of promoting development in education, health, safe water, youth vocational training, information technology, forest certification, and small to medium-sized enterprise (SME) development (USAID 2006).

Unexplored relationships involving NGOs, governments, and firms have important implications, not just for the definition of offshoring, but also for broader discussions about the role of MNCs and NGOs in the global political economy, and the linkages and spillovers among public, private, and nonprofit actors in developed and developing countries around the world. In times of economic crisis, "big picture" concerns about job security, cost reduction, and performance enhancement are paramount. Our discussion is intended to spur future research on a broader perspective of offshoring.

20.4 Conceptual Scope Versus Phenomenological Scope

Broadening the conceptual and phenomenological scope of offshoring requires two forms of bridge building. The first connects the concept and the phenomenon, or theory and reality. In identifying the benefits of bringing together organizational theorists and MNC strategic management researchers, Doz and Prahalad (1991) called for a bridge between concept and phenomena, or between theory and descriptive analysis. Doz and Prahalad (1991) implied that management theorists can get so caught up with theories that they make assumptions that apply only to simple or straight-forward phenomena, while academics closer to practice can become so mired in the complexity of multinational operations that they insufficiently exploit theory to explain the operations.

This concept–phenomenon connection can be developed in two ways. First, scholars may develop a theory and apply it to a phenomenon, what might be viewed as a deductive approach. Alternatively, one might first observe and describe a phenomenon and then identify a theory or theories that best fit that situation, what might be viewed as a more inductive approach. Both approaches can be problematic if done superficially, but both can lead to lasting contributions. Without strong connections between concepts and the phenomena of offshoring, the body of academic literature may continue to grow and make contributions, but perhaps without producing transformational insights, especially given our observations about the dynamic, boundary-blurring reality of offshoring.

The second bridge connects and integrates academic disciplines. To Cantwell and Brannen (2011, p. 4), "interdisciplinary research needs to be driven primarily by issues." Offshoring is a complex business phenomenon that would benefit from

an interdisciplinary approach. Cantwell and Brannen (2011, p. 3) argued the case for an "intellectual bridge" (p. 3) for scholars in one discipline to reach out to scholarship in other disciplines to tap new perspectives. Similarly, Cheng et al. (2009, p. 1072) advocated "addressing a phenomenon that can only be unpacked by combining theories, concepts, data and methods from multiple disciplines to explore the scope or boundary conditions of multiple disciplinary perspectives and the benefits of their integration."

The complex nature of offshoring lends itself to a multi-theoretical approach, as evidenced by strategic management and economic research that combines aspects of transaction cost economics, the resource-based view, alliance theory, and organizational learning theory (e.g., Mudambi and Tallman 2010). However, although offshoring has been examined through the lens of multiple academic disciplines other than strategic management, such as information systems (e.g., King and Torkzadeh (2008), marketing (e.g., Thelen et al. 2011; Bharadwaj and Roggeveen 2008), and political science (e.g., Margalit 2011), truly interdisciplinary conceptual models remain rare. In their review of the offshoring literature, Bunyaratavej et al. (2011) draw from and integrate the literature as it has been developed within management, international business, innovation, information systems, information technology, and operations management fields, but they do not move beyond these "business" disciplines to consider broader social science perspectives.

In this chapter, we construct a broader contextual framework for offshoring, as practiced in the three phenomenological domains of business, NGOs, and government, and as conceptualized by their affiliated theoretical foundations. Our particular focus is on MNCs, multinational NGOs, and governments that offshore services. Doing so requires recognition of differences in theoretical assumptions and practical assumptions.

An essential starting point is the examination of phenomenological assumptions. Phenomenological assumptions, according to Bendersky and McGinn (2010), are revealed beliefs about the fundamental qualities of the behavior or phenomenon, and beliefs regarding how the environment affects the behavior. They also include assumptions regarding how stable or dynamic are the relationships between the phenomenon and the environment. Phenomenological assumptions can be examined from an institutional theory perspective (Kostova et al. 2008). Phenomenological assumptions can be specific to a discipline or can be held by more than one discipline. Although researchers in different disciplines may all examine the same phenomenon, incompatible or conflicting assumptions form barriers to knowledge dissemination and integration across disciplines (Bendersky and McGinn 2010). As a result, it is important to identify the underlying assumptions and determine whether there are conflicts that could get in the way of broader understanding.

Offshoring research is dominated by the assumptions of multinational firms embedded in MNC institutional environments, yet the institutional environments of government and NGOs offer several contrasting assumptions. In addition, interdisciplinary differences in phenomenological assumptions are not stationary.

As articulated by Kostova et al. (2008), institutional environments are "fragmented, ill-defined and constantly evolving," and the relationships of the parties with their institutional environments can be "dynamic, symbolic and pro-active" (pp. 1001–1002). Phenomenological assumptions change as the underlying institutions change.

Institutional change lies at the heart of offshoring. In the MNC domain, not only do academics disagree over the nature and boundaries of the multinational firm, they argue about how and why the concept of a multinational firm is changing. This has fueled definitional debates on the distinctions between outsourcing and offshoring, especially in the context of sourcing practices between headquarters and subsidiaries. In the government domain, the role and reach of national, state, and local governments are continually shaped by changes in political power and voter sentiment. As NGOs grow, become more multinational, and develop relationships with government and private business, the assumptions of NGO sourcing activity also evolve.

The dynamic institutional environment can help to explain the reversibility of offshoring. As assumptions and conditions change, firms may stop the offshoring of a service activity and move to "re-shoring" the services and/or re-internalizing the production, either as a short-term or medium-term solution. Similarly, in the government domain, it is increasingly common to see reversals of decisions by governments to privatize or contract out services either to domestic or foreign firms or to NGOs (Hefetz and Warner 2004; Warner 2010). This can be due to the lack of realization of cost savings or the lack of effectiveness of meeting goals of social inclusion or public welfare. Another reversal for MNCs takes place when emerging country service provider companies in India or the Philippines set up physical operations in the client countries (such as the United States or Japan), and hire employees in the client countries to provide the services to the client. The growing competencies of emerging country multinational firms such as Tata Consultancy Services and Wipro can explain some aspects of this practice of "reverse offshoring" (see Bunyaratavej et al. 2011). In addition, some emerging country multinationals have reacted to negative public reaction to offshoring by acquiring U.S.-based service providers, which then opens the door to new contracts in government and other areas (Basu 2011). Fuller explanations of reverse offshoring practices may rely on conceptual input from other disciplines.

Environmental dynamism also partially explains the hybridization of offshoring practice. As institutional environments change, the optimal sourcing conditions may also change. At the extreme, firms can offshore a service to a foreign third-party firm in an arms-length arrangement. However, firms can develop strategic partnerships or alliances with one or more foreign third-party service providers, or can turn to one of their own foreign subsidiaries. In the government domain, hybrid arrangements are also common, with a wide range of public–private partnerships and public–NGO partnerships (Warner and Hefetz 2008).

Although the academic term of global sourcing covers well the scope of activity, public perception and terminology still matter and so are worth consideration. In addition to the academic gap between theory and descriptive analysis

(Doz and Prahalad 1991), there may be a gap between public perception, academic perception, and reality. The term *offshoring* typically refers to a domestic for-profit company's decision to obtain products or services from a foreign-based company instead of continuing to source the products or services internally and locally (Lewin et al. 2009). If a German firm contracts with a Ukrainian firm to provide engineering services, that is considered offshoring by academics and the public. A less clear situation is one in which a German firm recruits Ukrainian engineers to relocate temporarily to Germany. That could be defined as offshoring since non-Germans have been contracted to do the work, but might not be seen as offshoring since the services are provided within Germany. Beyond the definition, public reaction to these two options may differ, depending on whether there is a perceived shortage of qualified engineers or whether the German public perceives there to be an underutilized source of labor within Germany for these jobs. Perception of the local availability of qualified local workers is likely to affect public definitions of offshoring, and public reaction to offshoring decisions.

In addition, public definitions and perception may markedly differ for jobs perceived as undesirable or dangerous. Stakeholders might be more likely to label a practice as offshoring, and negatively perceive the offshoring, if the activity involves a desirable job. For example, when a U.S. local firm contracts with a Mexican agent to supply temporary labor from Mexico for undesirable landscaping or restaurant work, that practice may be publicly seen as offshoring, even if the services are provided onshore, since the services are not provided by U.S. workers. Similarly, when the U.S. government contracts embassy security in Baghdad to a U.S. defense contractor who then subcontracts to a Filipino security company who supplies Filipino workers, some may consider that to be offshoring. Yet, in these two examples, public disapproval may not materialize because there may be greater acceptance of offshoring relatively undesirable jobs and more willingness to accept foreign workers for such positions, especially if they are hired by a domestic intermediary or "middle man". Hence, perception of the desirability of a job is likely to affect public definitions of offshoring and public reaction to offshoring decisions.

The blurring boundaries of MNCs can make it difficult to identify what is a domestic company and what is a foreign company. This blurriness raises the question of the relative importance of different areas of public concern about offshoring. Public outrage over offshoring is typically in response to concerns about loss of jobs, loss of control and security, or loss of service quality. Stakeholders may also care where the company profit goes or about the nationality of service workers. If jobs are filled locally by local workers employed by a foreign company, there is likely to be less public concern. There is less public concern either when the offshoring situation is temporary, or if it involves a dangerous or undesirable tasks or conditions. In general, the level of concern is highly variable and dependent upon the context, the culture, and economic orientation of the home (source) country, and many other variables.

20.5 Contrasting Assumptions

A premise underlying this rethinking of offshoring is the existence of contrasting assumptions across the disciplines involved in offshoring research. It is important to identify the assumptions across domains and disciplines and see where there is agreement and where there is conflict. A broadening of the scope of offshoring beyond the MNC domain has the potential to produce new insights.

Table 20.1 provides some of these contrasting assumptions. For each of the three main actors in our discussion—MNCs, governments, and NGOs—we summarize what is generally understood to be the assumptions regarding the motivation for offshoring, assumptions about the relationship with the institutional environment, and assumptions about the stability of the underlying institutions. It is striking how different these assumptions are across these sectors, with some notable exceptions, especially the basic assumptions about why actors in these sectors engage in offshoring in the first instance. In terms of the relationship with the institutional environment, governments are the principal actors defining the institutional environment, and so they have the greatest discretion. NGOs seek to influence the environment while, on the whole, MNCs must adapt to it.

In Table 20.2, we present an analysis of what are the principal strategic concerns about offshoring among these three sectors and their relevant constituencies. Although there are many shared concerns, here we will explore some of the potential differences. We propose that distinct objectives, value realization, risk, and internal and external stakeholder concerns characterize the strategic concerns of these actors and influence the implementation.

Table 20.1 Phenomenological assumptions of offshoring across domains

	MNC	Government	NGO
Assumptions about the motivation and behavior	Motivated by desire to profit through global expansions	Motivated by desire to respond (democratically) to externalities; provide social goods	Motivated by desire to respond to/remedy social or environmental problem, especially those unmet by governments
Assumptions about the relationship with the institutional environment	Must adapt to (become isomorphic) or overcome institutional environment	Shapes/defines institutional environment, although increasingly unable/unwilling to do so (e.g., privatization, deregulation, failed/fragile states)	Influences governments and firms to shape or define institutional environment in a manner that is responsive to social needs
Assumptions about the stability of the underlying institutions	Variable stability	Historically stable over time; increasingly unstable	Variable stability

Table 20.2 Differences in strategic concerns about offshoring

	Objectives	Value realization	Risk	Internal stakeholder concerns	External stakeholder concerns
MNC	Lower cost	Higher value to customer	Loss of capability Loss of control	Employees worry about job security or wage cuts	outrage from employees, customers, community
	Labor access Lower permanent headcount Better service New markets	Higher shareholder value			Loss of local jobs Loss of taxes Degradation of service quality
NGO	Lower cost	Higher value to recipients	Loss of legitimacy/ reputation/ credibility among recipients and supporters	Employees lose faith in organizational integrity and independence	Donors lose faith in organizational integrity and independence
	Labor access Lower headcount Better service New markets Lower risk	Higher value to donors			
Government	Lower cost	Lower taxpayer burden	Loss of capability Loss of control	Employees worry about how job losses affect their duties and organizational integrity	Voter outrage due to job losses and loss of capability and control
	Labor access Lower permanent headcount Better service Lower risk	Improved service			

MNCs, governments, and NGOs all share the objectives of lowering cost, improved labor access, better service, and new markets, and MNCs and NGOs may both be interested in new markets. Regarding value realization, MNCs and NGOs have similar notions of value to customers/recipients, and value to shareholders/donors, while government has a quite different perspective on value realization. Perception of the risk associated with offshoring also varies. MNCs and government perceive a risk of loss of capability and loss of control, while NGOs may emphasize a risk of loss of reputation or legitimacy. The internal stakeholders of MNCs are primarily concerned with job security and wages, and less concerned with firm integrity. In contrast, NGO internal stakeholders may be more concerned about organizational independence and organizational integrity. Government internal stakeholders share both areas of concern. Finally, external stakeholder concerns or outrage takes different forms. External stakeholders of MNCs such as local communities and customers may be most concerned about loss of jobs, loss of taxes, and decreased quality of service. The concern of NGO external stakeholders is similar to that of the NGO internal stakeholders, stemming from high involvement in the mission of the NGO. The external stakeholders of government express concern about job loss, and loss of capability and control.

Overall, the identification of contrasting assumptions and differences in strategic concerns can help to highlight the complexity of the social, business, and political environment of offshoring. Offshoring is undertaken by firms, governments and NGOs, for a multiple of reasons and with a multitude of consequences. The summaries in Tables 20.1 and 20.2 highlight the cross-domain similarities and differences and stimulate new thinking about the conceptual nature of offshoring.

20.6 Provocations for Future Research on Offshoring

Since assumptions of multinational firms have dominated past research on offshoring, a fresh look at conflicting and changing assumptions can offer new insights. To spur further discussion, we have identified a few widely held beliefs about offshoring—what we term "tenets" and juxtapose them with an alternative view, what we term "provocations" that challenge those tenets and suggest that the research agenda for offshoring is still unsettled and requires further extensions or even transformations. This approach is inspired by Kostova et al. (2008) presentation of institutional theory "tenets" and "provocations."

Conceptual Scope

Offshoring Tenet #1. Since the concept of offshoring is closely linked to philosophical and political debates, the term global sourcing is a more value-neutral and widely acceptable term for firm-to-firm decisions.

Offshoring Provocation #1. Stakeholders rarely take a philosophical stand on global sourcing, but do care about the objectives and risks of firm, government, and NGO sourcing strategies that affect them.

In understanding the epistemological foundations and practical applications of a phenomenon, definitions matter to academics interested in theory development and in practice. Or do they? Popular representations of management theory offer contradictory insights. For example, in cross-cultural research, the continuing debate over universalisms versus particularism persists (Trompenaars and Hampden-Turner 1998). One driving academic concern is the need for theory-based definitions and constructs. Multiple articles on offshoring and outsourcing have defined and re-defined offshoring, and have argued about definitions offered by other academics.

In the non-academic world, the practical or political assumption is that since actions designated as offshoring or outsourcing are more likely to raise stakeholder concerns, those terms are avoided by firms, NGOs, and government. In our view, future research can use the global sourcing term as a useful conceptual umbrella, but that will not completely ward off stakeholder criticisms. Future analysis should also incorporate global sourcing objectives and consequences, whether conducted by MNCs, NGOs, or governments. The perception of the different stakeholders merits further examination.

Phenomenological Scope

> Offshoring Tenet #2. Offshoring is an international business concern, best analyzed with international business and economic theory.
> Offshoring Provocation #2. Offshoring is also a facet and reflection of broader societal concerns and issues and therefore requires sociological, political, anthropological, legal, and psychological perspectives to fully understand. Integration of theory from non-business disciplines would enhance understanding of the phenomenon.

As we have underscored through practical illustrations and theoretical arguments, offshoring transcends international business theories—and even business theories more generally. The full range of social science (and even humanities) perspectives should be leveraged to fully comprehend the scope and impact of global sourcing.

Environmental Dynamism

> Offshoring Tenet #3. Firm sourcing decisions and stakeholder concerns are driven by changes in the economic environment.
> Offshoring Provocation #3. Firms, NGOs, governments, and stakeholders are affected by changes in the political, cultural, and social environment, not just by the economic environment.

Stakeholders vary in their awareness of change and in what is changing the most. Change can be good, and change can be bad. Future research could examine to what degree stakeholder objections stem from a discomfort with change itself and could identify how sourcing decisions are affected by different aspects of environmental change.

For example, perceptions of job desirability shape the liability of foreignness. Although stakeholders may decry the offshoring of an activity, there is a growing acknowledgment of the difficulty of hiring local workers for less desirable jobs. The less desirable the job, the less likely stakeholders are to object to sourcing

decisions, and the more willingness to accept foreign service providers, especially if hired by a domestic-based intermediary. With changing conditions, communities and voters can make the distinction between good jobs and dirty jobs. There can also be acknowledgment of a temporary unavailability of qualified local workers. As is true in a criminal trial, motive and extraneous circumstances often matter to those making judgment. Stakeholders may take firm motives and external circumstances into account when evaluating sourcing decisions. Future research can lead to a better understanding of how the many dimensions of environmental change can affect sourcing decisions and stakeholder reaction.

Institutional Dynamism

> Offshoring Tenet #4. Firm sourcing decisions and stakeholder concerns are driven by changes in the institutional environment.
> Offshoring Provocation #4. The boundaries of firms, NGOs, and governments are so blurry that changing institutional boundaries are less relevant to stakeholders, requiring a dynamic, co-evolutionary perspective.

Concerns about loss of control, capability, security, risk, and service quality seem to matter more to some firms and stakeholders more than traditional interest in institutional boundaries. Consumer surveys continue to find low levels of trust in almost all institutions—business, government, labor, education, religion. Future research on sourcing should acknowledge the complex and dynamic institutional landscape and how stakeholder perceptions of institutions affect sourcing decisions and offshoring effectiveness.

20.7 Conclusions

In this chapter, we have sought to challenge some of the widely held assumptions about offshoring as a phenomenon and as a subject of scholarly theorizing and investigation. In particular, we have argued that the scope of current theoretical and practical conceptualizations of offshoring is too narrow and limited and should be substantially broadened to encompass the range of commercial and non-commercial relationships among public, private, and nonprofit stakeholders in the global business environment. Further, we have suggested that relaxing these conceptual and phenomenological constraints suggests a more inclusive polyglot model with a range of scholarly perspectives, drawing from a much wider set of scholarly traditions in the social and behavioral sciences, and even the humanities. Finally, we have proposed that this more holistic perspective provides an opportunity to more fully process complexity and dynamism, and stimulate a more intellectually productive and practically relevant research agenda on global sourcing.

By broadening and challenging the phenomenological and conceptual scope, offshoring will remain a “big idea” that provokes theoretical and practical arguments—and relevant insights.

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Chapter 21
The Complexity of Offshoring: A Comparative Study of Mexican Maquiladora Plants and Indian Outsourcing Offices from an Institutional-Prospect Theory Perspective

Van V. Miller, Ananda Mukherji and Kurt Loess

Abstract To improve our understanding of offshoring and how it is evolving, salient ideas from both institutional and prospect theories are utilized to build a more descriptive model of how decisions are made to (re)direct foreign investment into offshored activities. Careful examinations of the offshoring programs in India and Mexico reveal that they took different investment trajectories during the past decade that can be aptly explained by this integrative model. The primary information used to measure the population trends of offshoring firms in India and Mexico comes from proprietary data sources for each country that issue annual reports on the number of operators in their respective offshoring sectors, that is, services and manufacturing.

Keywords Maquilas · Offshoring · Outsourcing · Call centers · Business processes · India · Mexico · Prospect theory

V. V. Miller (✉)
Central Michigan University, 204H Smith Hall-CMU, Mount Pleasant, MI 48859, USA
e-mail: mille2v@cmich.edu

A. Mukherji
Texas A&M International University, Laredo, USA
e-mail: max@tamiu.edu

K. Loess
East Tennessee State University, Johnson City, USA
e-mail: kloess@etsu.edu

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21.1 Introduction

In a recent issue of the Journal of International Business Studies (V42, N4), Liu et al. (2011) reveal the results of their research into the complex nature of offshoring decisions for service activities. Though we agree with their viewpoint that offshoring choices cannot be easily explained, we do feel that they have not dug deep enough into the complexity of offshoring and that they have limited their exploration with a US-centric sample (all data are from the U.S. Bureau of Economic Analysis which collects information from US firms only). In an attempt to broaden this constrained viewpoint, our study examines offshoring from the national perspectives of India and Mexico and relies on prospect theory [Kahneman and Tversky (1979, 2000); Tversky and Kahneman (1992); Kahneman (2011), for simplicity the distinction between cumulative prospective theory and prospect theory will be overlooked in this chapter] to frame offshoring institutions in the mindset of business decision makers who ultimately choose where to locate or relocate offshored activities.

Prospect theory, one robust manifestation of behavioral economics, rigorously describes the preferences and outcomes of individual decision makers. Those preferences and eventual decision outcomes are influenced by the perceived risk, gain versus loss, that decision makers feel they face in a given situation. As stipulated by the theory, gain–loss preferences are asymmetrical. A gain of 'x' in a decision makers mind carries less weight than an equivalent loss of 'x'. This normal bias in human decision making leads to the loss aversion principle that undergirds prospect theory and helps to explain offshored investment decisions more rigorously than does expected utility theory. By heeding this principle, we root our analysis of offshoring in the descriptive reality of (re)directed foreign direct investment decisions and not in the prescriptive theories of international business scholars (Santangelo and Meyer 2011) who mistakenly, though understandably, confuse and substitute hypothetical precepts for actual organizational actions.

In this chapter, we describe and explain the internal evolutions, decision frames, and entry–exit choices for two major offshoring programs—Mexican maquiladora plants (MMP) and Indian offshoring offices (IOO). Using salient concepts/principles from institutional and prospect theories (both explained next), we develop a main hypothesis and empirically show, using population data for each, that the MMP severely declined during one time period in the last decade and that the IOO expanded during the same time period and then slowed down after 2008. Given their different institutional frames yet consistent with our central hypothesis, these divergent trajectories need to be better understood and appreciated—from the gains versus losses perspective of prospect theory—if researchers expect to make headway in their studies of both services and manufacturing offshoring. To add real substance and theoretical insights to such understanding, our study will conclude by looking briefly at the operations of Delphi Automotive (a bankrupted former subsidiary of General Motors) and of Tata Consultancy Services (an expanding former division of the Tata Corporation).

21.2 Institutional Theory

To develop the construct of institutional frames, we rely on Scott (1995, p. 33), who has developed an integrative framework that admirably synthesizes the vast literature comprising institutional theory. His definition of an institution specifies that an institution has three main components: pillars (composed of structures and activities), carriers, and levels:

> Institutions consist of cognitive, normative, and regulative structures and activities that provide stability and meaning to social behavior. Institutions are transported by various carriers—cultures, structures, and routines—and they operate at multiple levels of jurisdiction.

Pillars support the institution by providing it with meaningful stability, while carriers overtly reinforce this human social construction at multiple levels. For Scott, pillars and carriers co-exist at micro (the firm)-, meso (the industry or field)-, and macro (the nation)-levels. While the definition has a sociological flavor to it, it does include institutional ideas from economics and political science and facilitates the construction of comprehensive institutional frames, which constitute the lenses that actual decision makers peer through when deciding on where to locate offshored activities. To reveal the multi-disciplinary nature of decision lenses, we briefly review relevant literature from each discipline next.

21.2.1 Economics: Price Signals May or May Not Matter

Looking first at economics, Scott's main institutional components run through the field's major writings and add credence to his comprehensive typology. The pillar-like and persistent nature of an institution can be found in North's rules (1990), Williamson's governance structures (1985), and Nelson and Winter's organizational routines as genes (1982). The idea that institutions reside at different levels becomes quite apparent in the focus that each writer takes. North concentrates on the macro-level and spends much of his time explaining property rights and how they are enforced in different nations and at distinct time periods. Williamson, on the other hand, examines governance structures at the micro-level—whether firms choose to use the market or the hierarchy to organize and implement their economic transactions. Nelson and Winter scrutinize the meso-level with a scope that is much broader than Williamson's. Drawing on their biological metaphor, they study organizational evolution within an industry through the utilization of activities and routines. Whether called rules, routines, or governance structures, institutional pillars provide the fixed frames that stabilize organizational transactions (including those arising from foreign investment) as they emerge from the micro-, meso-, and macro-levels.

Institutional carriers are also present in the economics literature, but the difference between the two major writers becomes most apparent here. North (1990) contends that institutions are path dependent and evolve along a well-defined route at the macro-level, where his interests lie. Given that an institution, that is, a property right, represents a negotiated outcome, it will not be readily changed without a political battle that most actors will be reluctant to start due to its uncertain outcome. For North, institutions emanate from national political struggles and not from economic efficiency. Price signals are not paramount to him. Institutional persistence and change are more about politics than economics within a given nation. A society is fortunate if the structures and routines that carry its institutions are also efficient, but there is no guarantee that carriers will be efficient. By its nature, the frame for a national economic institution, like the MMP, may be sticky and slow to change, that is, locked-in and resistant to change, but it can change if the struggle is intense enough.

Williamson (1985) argues that carriers do reveal efficient institutions, at least for the micro-level. In his view, firms choose governance structures and their concomitant routines based on price signals. If transactions are cheaper via the hierarchy, then firms will transact internally. If the market is more efficient, then they will conduct their exchanges externally wherever needed. In terms of FDI, Williamson's ideas (encapsulated in transaction-cost economics and the internalization advantage of Dunning's eclectic paradigm) can be interpreted to mean that managerial decisions will be governed by which is more efficient—the market or the hierarchy in a given country. For Williamson, the efficient nature of economic institutions implies that firms can readily change when prices change, but those price signals are generally associated with a national context, not an international one. Nevertheless, his ideas can be easily translated into the international context where a firm would compare the manufacturing costs of an export processing zone (EPZ) in one country with those from other countries.

Nelson and Winter (1982) at the meso-level seem to take an institutional position that is midway between North and Williamson in terms of economic efficiency—price signals do matter, and those signals are carried and filtered through the routines and practices already in place. With respect to institutional pillars manifested through routines (repeated procedures and activities), their thinking is in agreement with both North and Williamson. The frame around those pillars stabilizes and supports organizational behavior so that it is both predictable and profitable. Using the biological analogy, routines act like genes that can benefit or harm an organization as it encounters changes in its competitive environment. As industries change, some firms will evolve and survive, while others will die due to the inappropriateness of their inherent routines. How these routines will affect (re)directed FDI decisions is a moot point in their discussion, but the importance of institutions remains prominent as business organizations confront threats to their framed operating environments.

21.2.2 Sociology: Offshored Practices Do Matter

From the sociological perspective, the notion of institutional pillars carried by organizational structures and routines is best enunciated by DiMaggio and Powell (1983) in their seminal article on isomorphism and the "iron triangle". Though work in this genre often concentrates its measurement at the micro-level, it clearly assumes and reveals isomorphic pressure at the meso-level, that is, organizational field. This can be readily detected in the work of Guler et al. (2002), who carefully examine the adoption of the ISO 9000 standard by firms across nations. For these institutional researchers, a multitude of manufacturers has adopted this quality standard due to the inter-organizational mechanisms that result in isomorphism. Their findings emphasize the importance of a pressure at one level influencing behavior at a lower level. According to them, the pressure does not stem necessarily from price signals or a desire to be efficient, but it follows from a meta-national desire to emulate and institutionalize the structures and persistent routines of others. From our offshoring perspective with its focus on the (re)direction of FDI, one could argue that the (re)action of setting up or leaving behind operations in an EPZ is more of an imitative or mimetic response than an efficiency objective.

21.2.3 Political Science: Government Does Matter to Offshoring Practices

Turning to political science (especially relevant to the Mexican context that we focus on initially), Thacker (2000), who provides an in-depth study of the Mexican business sector and its increasing clout on government's economic policies (e.g., NAFTA), argues that price signals do matter in the development of institutions. From his perspective, capital—its availability and cost—reigns supreme in the institutional struggles (a la North) between the business sector and other Mexican sectors. In Thacker's discussion of what has transpired over the last couple decades, one finds evidence that sunk costs or endowment effects, represented by the capital reflected in FDI numbers, do influence the decision making of Mexican business investors and sympathetic government officials. Coming out of a political science perspective, Thacker's analysis does not address Nelson and Winter's institutional routines or Williamson's institutional structures [a more thorough discussion of institutional economics and the state can be found in Khan (1995)]. His analysis does, however, highlight the potential cognitive dimension of invested capital and its price upon the institutional frames to which firms respond as they consider operating in manufacturing EPZs.

21.2.4 Institutional Integration

To integrate the institutional framing construct reviewed above, Thacker's (2000) relevant examination of Mexican economic institutions and corporate sunk costs along with research from others (Miller and Loess 2002; Witt and Lewin 2007) provide a rationale for the proposal to combine institutional plus prospect theories in an evolving international setting [see Harriss et al. (1995) for a comprehensive treatment of institutionalism in emerging economies]. In an investigation of the foreign sales corporation (FSC), Miller and Loess found that US exporters behaved very differently in the face of sure financial gains/losses from their use of the institutionalized FSC. They revealed that Williamson is correct, but only to a degree. Price signals do matter, but not in the symmetrical way specified by the standard model of expected utility theory that the eclectic paradigm assumes (Dunning 1981). As discussed and specified by Camerer (2000), prospect theory's loss aversion (a stronger reaction to a threatening loss) explains such asymmetrical behavior much more robustly than does expected utility theory as noted in our review below.

Before exploring the relevant ideas of that theory, however, we wish to reiterate our rationale and method for utilizing institutional frames. One can think of institutions simply as the persistent rules and routines that support the stability needed for doing business. Until now, these rules and routines have generally been studied by institutional theorists at the national level, for example, the collection of single country institutional studies edited by Dacin et al. (2002). Though their focus on institutional change is critical, they approach it from a historical perspective—when nation-states predominated in the institutional arena. With economic globalization occurring via the WTO, the EU, and ASEAN (to cite just a few international acronyms from the 1990s), a national approach to institutions is quickly becoming insufficient. We therefore propose an examination of offshoring decisions with an expanded institutional construct, redefined as persistent business rules and routines for profit-seeking firms that operate both across nations and at the international level [see Dam's The Rules of the Global Game (2001), for a general discussion of this perspective].

Traditionally, in the field of international business, FDI research has focused on why a home corporation decides to invest *initially* in operating assets within another country. Such an investment generally occurs in foreign assets and/or overseas operations. Focusing on offshoring, as this study does, our initial point of interest will be manufacturing EPZs, shorthand for designated areas housing outsourced activities. For explanatory and analytic purposes, we stipulate that such FDI is subject to the behavioral peculiarities of human decision making. In order to analyze the managerial decision to stay or relocate, the EPZ regime in a given country should be framed and reacted to as a nationally particular institution (Scott 1995) with its own rules/routines (regulative, cognitive, and normative) that will result in financial gains/losses from the offshored activities there. This stems from the fact that *it is the institutional frame* to which managers react when they

experience expected gains and losses from their current operations. *It is the uncertainty of institutional frame*(*s*) they consider and evaluate as distinct choices—one of which is not to relocate if the current institutional arrangement can be maintained or enhanced. These institutional frames for offshored FDI decisions represent the substance of recent writings by Contractor (2011), Liu et al. (2011), and Santangelo and Meyer (2011). However, the essence of those decisions, or human judgments, is often overlooked as noted by Witt and Lewin (2007). As specified below and diagrammed in Fig. 21.1, human choices about competing institutional frames are subject to the concerns of prospect theory's frame valuation, which is in turn influenced by the theory's four main framing effects, all of which need to be more carefully scrutinized in offshoring research.

The conceptual ideas and research being advanced in this chapter can be succinctly explained as:

1. the original FDI/offshoring decision-act consists of an 'old' institution (see Belderbos and Sleuwaegen (2005); Chetty et al. (2006); Dikova and van Witteloostuijn (2007), for evidence that internationalizing the firm with FDI can be viewed as institutionally based) grounded in its rules and routines that form the substance of the initial frame for offshoring,
2. the subsequent decision to consider or engage in re-directed foreign investment for offshoring obligates the decision maker to compare the substance of the 'old' institution with that of the 'new' institution(s) and is subject to the conditions of prospect theory, to which we now turn.

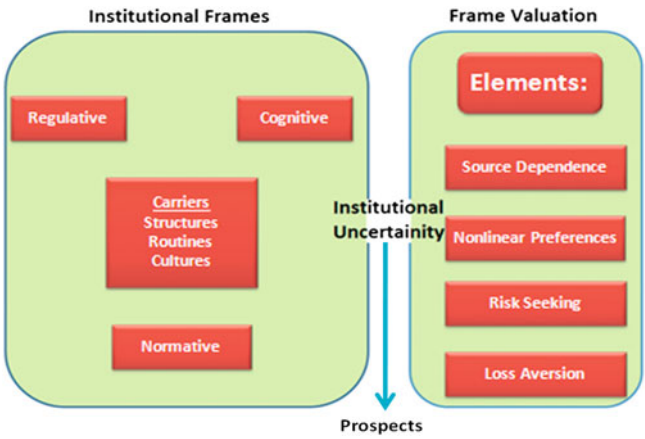


Fig. 21.1 Human choices about competing institutional frames are subject to the concerns of prospect theory's frame valuation

21.3 Prospect Theory

In a germane article about applied prospect theory, Camerer (2000) discusses and illustrates some of the major elements associated with it. The element that he focuses on is the loss aversion principle, which is associated with one's judgmental reaction to a perceived reference point within a frame (page 288)—*the value of loss* $-x$ *is larger in magnitude than the value of an equal-sized gain* (*i.e.,* $-v(-x) > v(x)$ *for* $x > 0$). According to the loss aversion principle, equal-sized deviations from the reference point are valued differently, with negative (loss) deviations weighted more heavily. Related to loss aversion is the endowment effect, which is a judgmental bias in favor of the status quo, that is, against the loss of that which now exists. In international business decisions, this is often the result of the sunk FDI costs one has already made or invested. This sunk cost in the status quo has been examined by Salter and Sharp (1997), who contrasted Asian with North American managers, and by Thacker (2000), in his discussion of decisions about institutions that impact capital investments in Mexico. Thacker's discussion of sunk costs in Mexico's offshoring institutions and Camerer's emphasis on asymmetrical financial gains/losses are cogent examples that illustrate the conceptual link between the two primary theories—institutional and prospect—being utilized in our offshoring research endeavors.

A fundamental element of prospect theory carries the label of framing-effect, which was noted above. Framing effects, that is, source dependence, nonlinear preferences, risk seeking, and loss aversion, which give rise to frame valuations as depicted in Fig. 21.1 [see Tversky and Kahneman (1992) and Holmes et al. (2011) for a complete discussion of these effects and cumulative prospect theory], are the explanatory variables relevant for a complete examination of offshored FDI. Framing effects, in particular, have received considerable scholarly attention in recent years, as the following titles reveal:

- Breaking the Frame: An Analysis of Strategic Cognition and Decision Making under Uncertainty (Hodgkinson et al. 1999),
- Shifts of Reference Points for Framing of Strategic Decisions and Changing Risk-Return Associations (Lehner 2000),
- Using Credible Advice to Overcome Framing Effects (Druckman 2001),
- Eliminating a Framing Bias by Using Simple Instructions to 'Think Harder' and Respondents with Managerial Experience: Comment on "Breaking the Frame"
- (Wright and Goodwin 2002),
- Further Reflections on the Elimination of Framing Bias in Strategic Decision Making (Hodgkinson et al. 2002).

Even though there is much debate about the nature and types of framing effects, we are conducting our study in keeping with Hodgkinson et al.'s initial statement—*These studies indicate that the framing bias is likely to be an important factor in strategic decision making, and suggest that cognitive mapping provides an effective means of limiting the damage accruing from this bias* (1999, p. 977).

Framing bias is a major concern as offshoring decision makers construct institutional frames to make judgments about re-directing foreign investment in light of their current situation. Three of the four framing-effect elements noted above seem particularly germane for present purposes. They are: source dependence—where there is an over reliance on a provider of information, knowledge, or expertise; risk seeking—the tendency in certain situations to become over eager when assuming risks; and, loss aversion—the propensity to fear losses more than to covet comparable gains. In the latter case, the relationship between institutional framing effects and the much studied loss aversion principle has been examined and discussed by George et al. (2006), Kennedy and Fiss (2009), Shimizu (2007), and Witt and Lewin (2007). Wu and Markle (2007) speculate that human cognition most likely results in asymmetrical judgments because the brain itself processes framed gains and losses in different cerebral areas. Such speculation is not idle, given that the brain processes fear and pleasure separately; thus, framing effects due to loss aversion should not be ignored in studies involving human cognition.

Previously, Fiegenbaum et al. (1996) tied the cognitive elements of loss aversion plus framing and endowment effects together for business strategists. Building upon Kahneman and Tversky (1979), Fiegenbaum and his associates developed a theory for business strategists around the concept of a strategic reference point (SRP). According to Fiegenbaum et al., business strategists make decisions according to how they view their firm and other firms relative to the SRP. Taken together, all of the elements form a frame around the SRP for managerial decisions. These decisions or judgments are, of course, influenced by human loss aversion arising from the impact of framing effects.

Revolving around the SRP, frames are constructed on three substantive dimensions: internal capability, external conditions, and time. The first two are very similar to the ownership and location advantages of the eclectic paradigm. Taken jointly, all three define a three-dimensional space or matrix within which the SRP is located, according to Fiegenbaum and his co-authors. In addition, it is conceived as an analytical device for evaluating complete business units with revenue/expense contingencies and membership in a strategic group. Its elegance is truly complex and quite difficult to operationalize. Nevertheless, indirect empirical evidence does exist to support the hypothesized SRP as a valid and useful concept. Such evidence can be found in studies by Devers et al. (2007) in managerial valuations of stock options, Johnson et al. (1993) for consumer decisions about insurance, Weyland (2002) for national decisions regarding risk taking, Guler (2007) for venture capitalist judgments about sequential investments, and Larraza-Kintana et al. (2007) in CEO risk taking toward compensation contracts. All of these studies find that prospect theory and the related SRP concept are germane to human business decisions.

We initially chose to reduce the complexity of Fiegenbaum et al. (1996) by examining the MMP, where its individual businesses, maquilas, are essentially cost centers that should represent a sunk cost or endowment for offshoring decision makers. These cost centers lack a competitive referent group seeking revenues inside an industry. Thus, the program's maquilas are not nearly as complex as full

business units; however, they do operate in a globalizing world with multiple offshoring sites. Initially, the conceptual development of the three dimensions within the context of institutional frames was much less difficult in the cost-centered maquiladora situation. In view of what is happening to offshoring in India (discussed below) and the very recent theoretical contribution made by Holmes et al. (2011), we have decided to expand this framework to Indian offshoring offices (IOO) because the contrasting outcomes from the MMP and the IOO offer a fuller view of offshoring reality and a more immediate 'test' of the complete framework, in particular, the risk-seeking and source-dependence elements.

To summarize, Fiegenbaum et al. theorize that firms will react to their institutional frames based on their perceived position relative to the SRP. Similarly, we contend that strategic choices about (re)directed FDI will be based upon considerations of competing SRPs from different national settings. Using the MMP case, maquiladora managers who are very *favorably* positioned with regard to the current reference point will view the potential negative institutional change to the MMP as an existential threat and react defensively, that is, engage in a political struggle to keep the Program with its favorable business features. Those very *unfavorably* positioned will view the same uncertainty and react offensively—actively pursue relocation of their FDI to another national setting, for example, China. However, for those firms and managers who fall in between these two poles, their reactions will be less predictable and more susceptible to framing effects. The ultimate question that will arise from the competing SRPs is how carefully, which includes an allowance for any overreaction due to framing effects, do the offshoring managers compare the distinct national institutional frames when making judgments for an FDI decision? Do they later regret it? However, before that empirical question can be broached by us and eventually addressed in detailed future studies, the substantive and framed nature of offshoring decisions must be determined and established through an analysis of the two large offshoring programs we have selected to examine.

21.4 Prospects: Mexican Maquiladora Plants and Indian Offshoring Offices

In November 1965, the Mexican government initiated an economic development program that was distinct from its 1960s activities for development. The program permitted Mexican plants (generally owned and operated by US companies) to import duty-free materials from the United States, assemble them into finished or semi-finished goods, and then re-export them back to the United States with duty assessed only on the Mexican value added. Originally, such permission was only granted to plant operators in special economic zones (SEZs) along the United States border. After several years (see Miller and Mukherji 2010), *this early assembly effort for manufactured goods became the MMP* (*the official name would*

vary over the years), *which expanded and flourished across the country until* 2001 *when it experienced a serious downturn* (*a reported loss of* 500 *plants and* 300,000 *jobs*). During the 1980s, several significant transformations in the Program occurred. First, the Mexican government without success ordered the maquilas to increase their usage of Mexican materials, that is, to establish vertical linkages within the Mexican economy and thereby contribute to national economic development. Historically, it had been in the 1–2 % range and remained there throughout the 1980s. The second change related to the types of activities performed in the maquilas. Without any formal mandate, the maquiladora operators started to manufacture inside their rudimentary plants. This newer activity, usually found alongside the assembly operations, represented an evolutionary shift from labor intensive to capital intensive. Wilson (1992) first chronicled this transformation *from assembly operations only to assembly and manufacturing operations together*.

Later, there appeared a third class of maquiladora facility that performed more than just low-cost assembly and manufacturing activities. As discussed by Carrillo and Hualde (1997), this third-generation maquila performed design and engineering activities for major foreign firms by utilizing low-cost engineers schooled in Mexico and then hired and trained by the foreign entities. The spread of this latter type of maquiladora operation in Mexico has provided the country an offshoring sector that now spans most industrial activities, from the simplest, that is, sewing on buttons, to the most sophisticated—designing the next generation of automotive or electronic components. *This idea of offshoring generations is critical in our framework for understanding the technology of offshoring and the comparability of national institutional frames*.

Two of us (Miller and Mukherji 2010) found that the IOO sector in India, *like the MMP, includes three major activity segments or service modes as we term them* (*their almost simultaneous emergence precludes the use of generations which has a distinct chronological dimension to it*). They can be found in the IT enabled services and categorized as—*call centers* (*CC*), *business process outsourcing services* (*BP*), *and computer software development services* (*CS*). As discussed below, these three service modes are equivalent in form to the three manufacturing generations of the MMP and could lead to similar outcomes if institutional and contextual determinants were comparable (assuming favorable wage differentials in both countries).

Nevertheless, for the Indian case of offshoring, we will hypothesize different outcomes in light of institutional dissimilarities and of prospect differences. Our logic for this hypothesis begins by highlighting first the similarities between the MMP and the IOO. In both Mexico and India, the outsourcing sectors are involved in transformational activities. As noted by Miller and Mukherji (2010), *some Spanish writers even use this Latin-derived term to describe the MMP. In the MMP, the transformation is from and to materials in first and second generation plants and from human minds and for* (*the design of*) *materials in third-generation maquilas. In all three generations, the transformational activities are outsourcing based, that is, for export. In India, the IOO sector has also been export oriented,*

but with modes of services instead of generations of manufacturing. The first-mode, CC, like the first-generation maquila, does simple transformational activities, for example, receives and answers (from and to) telephone calls. The script in a call center is equivalent to the wiring jig in a maquila. The second-mode, BP, can be viewed as equivalent to a manufacturing operation in the MMP. In manufacturing, concentrated energy or force is applied in a systematic fashion to materials in order to transform them from their earlier state. In the BP mode, concentrated effort from the human brain, using well-established protocols, is applied to a human problem, for example, raw financial data or an x-ray picture, to yield an analytic result. In essence, a business service is rendered using standardized methods—the quintessence of modern manufacturing. In the third-mode, CS, there is, as in the third-generation maquila, considerable creative activity from humans to design and build something new for an external customer, for example, software for Microsoft. We wish to mention that this three-mode scheme coincides with the observations of reputable others (Business Week 2006; The Economist 2004), who illustrate three major categories of activity in the outsourcing/offshoring sector worldwide. The scheme is also comparable to how NASSCOM segments IT services in its reporting (www.nasscom.in 2011).

In spite of these internal (and institutional carriers) similarities, there are two major differences—sectoral and institutional—between the MMP and the IOO. The first, sectoral, recognizes that manufacturing and services have very different growth trajectories. Manufacturing now appears to be as agriculture was a century ago. It surely matters for survival, but its overall economic importance will likely decline in the decades ahead and this must be kept in mind when examining the two national programs. Though this difference may be seen as overwhelming by some observers, we do not believe it fully explains the divergent trajectories of the two programs over the short period of less than ten years that we scrutinize.

Thus, the second difference, institutional, seems in order. Substantively, the institutional differences can be couched directly in terms of business ownership, government rules, and organizational practices. Historically, the MMP has been foreign owned and dominated, whereas the IOO resides in the hands of Indian owners/operators. In Mexico, foreign corporations like Sony and Delphi ruled over the MMP for most of its existence; however, in India, the dominant firms are Indian, as we illustrate in our concluding case examples using Delphi and Tata Consultancy Services. In addition to the ownership difference, there are also the institutional contexts that emanate from the respective governments and their rules for the programs. As detailed elsewhere (Miller and Mukherji 2010), the level of uncertainty for the MMP was much higher than it was for the IOO. Mexico, due to its NAFTA obligations, was supposed to end the Program, but after years of hesitation and conflict [see chapters in Miller (2007) for a full discussion about this struggle], it decided in 2007 to maintain the MMP in a much revised form. This high level of regulatory uncertainty created a situation that Santangelo and Meyer (2011) contend will influence the external redirection or weak commitment of FDI to national offshored programs like Mexico's.

However, in India, there appears to be no evidence of a similar institutional context. There has been no anti-IOO sentiment against the existing rules coming from the national political leadership in Delhi. In fact, the opposite is more likely the case. Nevertheless, a low level of institutional uncertainty most likely exists now due to the organizational practices and routines that the IOO initiative started to require in 2007 between the transactional partners—the 'offshorer' and the 'offshoree', as we term them (Giridharadas 2007; Tagliabue 2007). In an insightful discussion, Tadelis (2007) explains in detail with corroborating evidence from major surveys of 'offshorers' that many, perhaps half of offshored operations in the first half of the 2000s, resulted in negative or disappointing outcomes. This situation seems particularly true where the offshored activity was relocated to a distant location—from Mexico to China or from the US to India. In framing-effect terms, the high degree of institutional uncertainty in Mexico may cause decision makers there to juxtapose the old and new institutional frames in a context where the "grass looks greener" in the new frame. Or, they may sense a real business threat where the analogous biological fight-or-flight response dominates their thinking and pushes them to relocate in a more welcoming setting. In essence, they have a strong bias toward the promise of the new given the bleakness of the old. This bias for the new frame and relocation away from the old should not be present among IOO decision makers given their much lower level of institutional uncertainty in India; nevertheless, the low level of uncertainty that has arisen for offshorers to India may cognitively stimulate IOO offshorees in India to consider other locations for, or to reshore, their operations. In our concluding discussion, we highlight this point using anecdotal evidence. Given the contrasting gain–loss prospects for corporate decision makers in Mexico and India, we hypothesize the following:

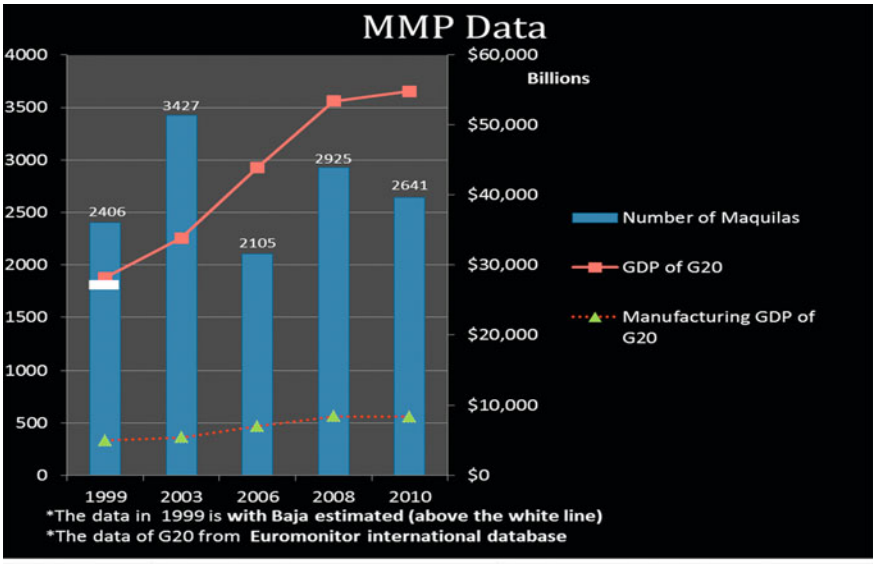
> An offshoring program exhibits a distorted growth trajectory whenever the competing institutional frames, prospects, contain disparate levels of uncertainty, specifically
>
> (a) The 2003–2006 downward trend of the MMP trajectory reverses itself in the later years when the Mexican frame, prospect, becomes less uncertain.
> (b) The upward trend of the IOO trajectory slows itself as key foreign institutional frames, prospects, become more uncertain.

21.4.1 Test of the Hypothesis for the MMP and the IOO

To test the specific hypotheses, we have relied on data sets that are generally recognized by knowledgeable observers of the MMP and the IOO to be reliable and authoritative for their respective populations of offshored operators. For the MMP, the Solunet Twin Plant Guide was purchased from Owen Media Partners, a Canadian company, that does an annual survey of maquilas in Mexico. Its methodology has been refined over a twenty-year period and is carried out by a trained group of personnel in Mexico who contact each of the maquiladora operators listed in their directories. This direct contact results in a data set that

does not suffer from the problem that was present in the official INEGI data for the MMP that only counted permits issued. Furthermore, given that Solunet sells (and hopes to have repeat sales) its annual listings to vendors who wish to do business with maquilas, there is a financial incentive for the company to be as inclusive as possible. This quest to be inclusive prompted Solunet to include more than maquilas—defined as entities holding the requisite permit from the federal government—beginning in 2006. Due to lingering doubts about how to distinguish between maquilas and non-maquilas in the listing, we have chosen to remain cautious and count all firms in the listings from 2006 onward. This choice means there could be an over count of maquilas but not an under count. For present purposes, the annual Mexican data for testing the hypothesis are from the 1999, 2003, 2006, 2008, and 2010 listings. The number of operating maquilas for each examined year is shown in Fig. 21.2 and reveals a conflicted trajectory that supports the hypothesis during the 2003–2006 and later periods.

The first data set for the IOO owner/operators comes from NASSCOM, the premier entity that reportedly represents the main companies in this service sector. It collects, prepares, and then disseminates the data through its website (www.nasscom.in 2011) to the public. As revealed in Fig. 21.3 (taken from NASSCOM), the growth trajectory was very sharp until 2007, after which it slowed considerably. A plausible, though not convincing, explanation for the halt



Years	GDP of G20	Manufacturing GDP of G20
1999	$28,185,698,700,000	$4,977,955,100,000
2003	$33,810,062,900,000	$5,437,393,300,000
2006	$43,914,678,600,000	$7,032,100,300,000
2008	$53,417,312,600,000	$8,446,917,700,000
2010	$54,813,867,700,000	$8,360,489,800,000

Fig. 21.2 The number of operating maquilas for each examined year

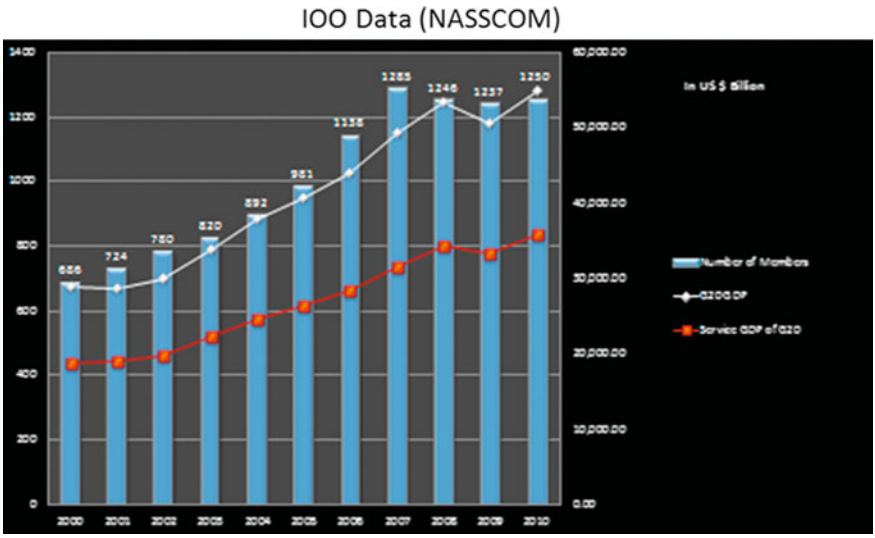


Fig. 21.3 The growth trajectory of the IOO over the time period studied

in growth during that year and the flat trajectory since then would be due to the global economic downturn that commenced in 2008 and has continued thereafter, especially in the western countries where most 'offshorers' are domiciled. However, this slow down began before the economic downturn and would be consistent with the hypothesized framing-effect influence. The second data set from software technology parks of India (STPI) is the official governmental agency that oversees and provides permits to IOOs located in SEZs and shows results that are totally consistent with the NASSCOM data and corroborate its numbers (Fig. 21.4).

Based on the data sets measuring the number of members in the MMP and the IOO programs, we find a substantial and very sharp decline in the number of MMP facilities during the past decade, particularly during the 2003–2006 period, and a very dissimilar trajectory for the IOO in the same time frame. In the MMP, the most dramatic loss of maquilas occurred after the North American economic downturn of 2001 and before the precipitous global economic decline of 2008. Thus, the external economic situation had minimal influence on the situation within the MMP. In fact and as hypothesized, the dramatic exit of maquilas from Mexico happened during the period, 2003–2006, when the legal fate of the MMP was being hotly debated within the country, that is, during a period of high institutional uncertainty. Nevertheless, many maquilas remained in spite of high uncertainty, which was consistent with the loss aversion element for frame valuation. The debate was finally resolved in 2007 when the new law governing the Program was passed and signed, and as predicted, we note more maquilas were being added by the end of this period. However, these gains from 2006 to 2008 were not consistent with the underlying economic situation but were in line with the risk-seeking and source-dependence elements of prospect theory.

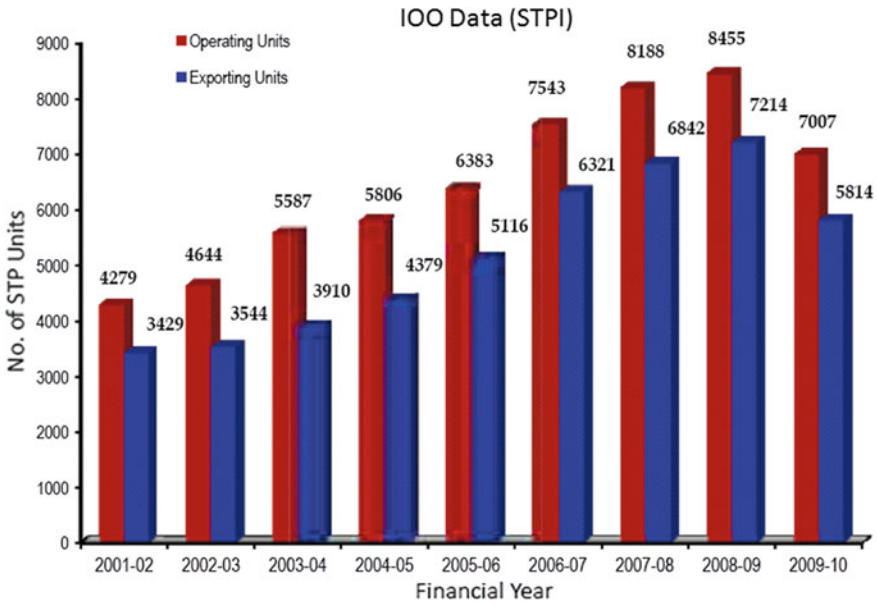


Fig. 21.4 Operating units and exporting units from 2001–2010

Also consistent with the risk-seeking and source-dependence elements of prospect theory is the early reversal of the IOO trajectory. This occurred before the 2008 economic collapse and appears counter-intuitive given the wage differentials known to exist between India and the U.S., for example. The loss of maquilas between 2008 and 2010 can be very likely explained by the global economic situation for manufacturing, but such an explanation seems less plausible for the IOO and service sector. In light of the sharp downturn in the MMP for the 2003–2006 period, we begin our concluding discussion in the next section by reiterating the theoretical and practical contribution of framing effects for achieving a better understanding of how offshoring decisions are made when institutional prospects differ.

21.5 Concluding Discussion and Illustration

Stated succinctly, our main contribution in this study of Mexican and Indian offshoring endeavors speaks to the importance of institutional frames and their comparative prospects in the minds of decision makers when they choose to establish/maintain or relocate their offshored activities. As the MMP data reveal, the many decisions to remain within the MMP plus the very high number of exit decisions between 2003 and 2006 along with the high incidence of (re)entry decisions after 2006 cannot be attributed to decision makers weighing the

information carefully and choosing a new offshoring site wisely. There is too much evidence, both anecdotal and in summary form (see Tadelis 2007), that many of the decisions to relocate offshored operations were later reversed or regretted.[1] As we have argued and presented herein, there exists a strong case for asserting that decision makers viewing a loss threatening frame in their current offshored activities will over react and too quickly opt for an institutional frame that appears to offer a more gainful prospect.

However, in the IOO case the circumstances are quite different. There is a sharp growth trajectory for Indian offshoring until 2007, a year before the global economy entered into a downturn. As already alluded to, the institutional frame for IOO owner/operators also suffers from uncertainty, but it is of a different type and lower magnitude. For IOO decision makers, especially the largest which are and have always been Indian owned, they have broadened their operations due to the incipient institutional uncertainty between them and their offshoring partners as detailed by Tadelis in transaction-cost terms (2007) and has resulted in numerous reports of re-shoring back to Europe and the United States (Tagliabue 2007; Giridharadas 2007; Glader 2011; Timmons 2011) under the aegis of the IOO firm. Similar re-shoring endeavors have not been reported for MMP operators (as of 2010), who are invariably foreign owned, particularly the largest operators.

This contrast in re-shoring initiatives due to ownership can be easily discerned in the cases of the two largest MMP and IOO operators, respectively, Delphi and Tata Consultancy Services (TCS). Delphi was the largest automotive components maker for the General Motors Corporation (GM) until it was spun off as an independent entity in 1999 and took over the global component operations that had been established by GM in the previous decades. For several years after that, it closed plants, reduced employment, and eventually filed for bankruptcy in 2005. The following year, it announced that it would close 21 of its 29 US plants and drastically downsize its workforce in numbers and wages. Though the most severe reductions were in the home country, it also shrank in Mexico. During the 1990s, it was common for the main MMP reporting site, www.maquilaportal.com, to show 70+ Delphi plants in Mexico with the highest number of employees, making Delphi the number one MMP operator. Today, late 2011, the company is not listed by that website in its top 100 Maquilas. Reporting elsewhere (Kolenc 2010) indicates that Delphi has 43 plants and 42,000 employees in Mexico. If accurate, this would result in Delphi being the number three MMP employer based on the

[1] In 2006, one of the authors was approached by a global Tier 1 automotive supplier about undertaking a study in Mexico to determine the feasibility of establishing an offshored design facility there. The proposal was intriguing due to the fact that this company had just announced publicly that it was halting construction of a manufacturing plant in Mexico, even though it was 90 % complete. The proposed design shop in Mexico would be a replacement for their offshored endeavor in India, which they now regretted. Recently, they had discovered a 'Slovakian' solution to automotive design for their European products. Slovakia was close to their plants in Europe, and it facilitated the design-production linkage at a lower cost. Now, they wanted to duplicate this experience in North America, and Mexico seemed ideal if they could find the right city.

maquilaportal.com figures. In light of these circumstances and outcomes, there is no reason to believe that Delphi's corporate ownership has been a positive institutional force for the firm, its employees, or the MMP program.

At TCS, the situation has been the reverse. Though in revenue terms, TCS is smaller than Delphi (US$8 vs. US$13 billion). In employment numbers, TCS has about 100,000 more personnel (with annual employee numbers increasing by the thousands during recent years), and the corporation has been on an acquisition binge as it expands operations around the world. We will not delve into the numerous ownership differences between TCS and Delphi except to note that control of TCS, a quasi-independent corporation, appears to remain in the hands of the founding Indian family. Thus, its enterprise roots stretch back into the nineteenth century when nascent Indian industrialists were struggling to overcome British dominance; however, TCS itself was born in the 1960s. Of particular interest to us is the expansion that TCS has most recently launched into the United States. In Midland, Michigan, TCS has just inaugurated an operation where the firm reportedly provides BP services to Dow Chemical using Michigan employees supervised by a few Indian managers. Prior to this TCS arrangement for Dow, these same BP services were handled by a large US accounting-consultancy firm that offshored the work to India and China. After a recent conversation (Personal 2011) with one of one of the Indian managers setting up this operation, the intended magnitude of the operation encompasses more than work for Dow. With an anticipated 500 employees, TCS expects to make the Midland facility its automotive manufacturing hub for the United States and is opening similar hubs for other industries in different cities, for example, Cincinnati for banking. In summary, this emergent re-shoring of what was once offshored by a US company to TCS in India provides a very different outcome from the one observed in the MMP Delphi case. Such re-shoring under the aegis of the initial offshoring recipient suggests that offshoring needs to be studied with multiple analytical lens in order to appreciate its real complexity in a globalized economic system. Prospect theory's frame valuation elements become particularly relevant in light of the stark wage differentials that clearly justify BP work in Mysore, India but not in Midland, Michigan, yet the latter site receives and will receive even more of this work in the future.

To conclude, we have tried to show through the analyses of the MMP and the IOO that offshoring is indeed complex. As it now evolves rapidly before us, it can no longer be understood with simple models predicated on wage differentials and little else. Clearly, wage differences represent the price signals of the transaction-cost viewpoint and do matter, but the current location upheaval in offshoring initiatives stems from more than just wages. As hypothesized and supported, offshoring decisions also depend on the prospects that decision makers perceive when they make judgments about institutional frames, and those judgments should not be construed as being free of human biases and aversions.

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Appendix A

Outsourcing refers to "the externalization of a company's non-core activities" (Ricart et al. 2010). It has also been defined as "the transfer of activities and processes previously conducted internally to an external party" (Ellram and Billington 2001 in Hätonen and Eriksson 2009) and "the delivery of products and services by an external provider" (Lewin et al. 2011).

Outsourcing can be both in the firm's home nation, as well as abroad, and entails an organizational restructuring of some activities. Outsourcing is a conscious abdication of selected value chain activities to external providers. When a company in another country is involved, the correct term is *offshore outsourcing* (Kedia and Mukherjee 2009, Monczka et al. 2005 and Klingebiel 2005 in Jahns, Hartmann and Bals 2006; Ricart et al. 2010).

Offshoring, on the other hand, is restructuring the firm along another dimension, namely geography.

"The term offshoring comes from the words *off* and *shore*, and refers to activities that are conducted far from the place of origin" (Ricart et al. 2010). It refers to the strategy of transferring activities and/or functions across national borders. It has also been defined as "the process of sourcing and coordinating tasks and business functions across national borders" (Lewin et al. 2011). This may be done through outsourcing, using external resources or a foreign contract vendor, or through foreign direct investment, using internal resources or relocating the operations to a company's own subsidiary (Contractor et al. 2010; Hagel and Brown 2005 in Hätonen and Eriksson 2009; Kedia and Mukherjee 2009; Manning et al. 2010).

Figure A illustrates the different alternatives companies have when deciding to outsource and/or offshore their business functions. It is assumed that the decision companies make depends on the perceived delocalization advantage and externalization advantage dimensions.

As a result, Fig. A shows two different models of offshoring:

Captive offshoring: The company establishes a subsidiary or local office in the chosen country. This creates a captive center to which the desired activities can be

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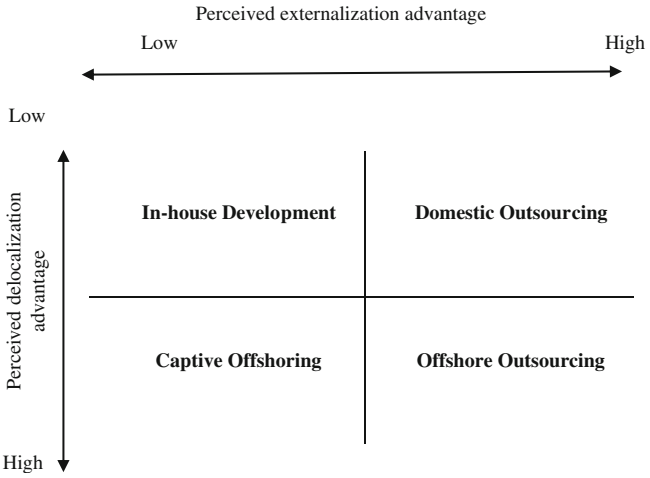

Fig. A Different sourcing models

brought. Therefore, activities are still conducted within the organization but in offshore markets.

Offshore outsourcing: This consists of a combination of offshoring and outsourcing. The company subcontracts an activity to a provider operating in a different country. Therefore, activities are conducted by outsourcing suppliers in offshore markets.

Alternative models: There are many other models that combine different features of the two models mentioned above. For example, companies may subcontract providers only in the initial stage of the offshoring in order to use their knowledge of the local market and thus facilitate the integration process. Other approaches include subcontracting a third party that does not operate in the destination country, subcontracting a national provider or participating in joint ventures.

Because firms are not easing into working in foreign environments, there is some uncertainty about the benefits of offshoring and a sense of insecurity about managing offshoring entities abroad (Hutzschenreuter et al. 2011).

Appendix B

Questionnaire

1. What were the strong market signals from 2000 to 2008 that were used in corporate strategic thinking?
2. What were the strong market signals from 2000 to 2008 that were not used in corporate strategic thinking?
3. What were the weak market signals from 2000 to 2008 that were used in corporate strategic thinking?
4. What were the weak market signals from 2000 to 2008 that were not used in corporate strategic thinking?
5. What was the marketing strategy used?
6. How was the brand used when targeting new customers?
7. How does Asian business culture differ from Finnish (Western) business culture?
8. Open discussion

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