

# Time to Capture the Momentum

Drivers and Effects of Swedish Companies' Establishment of R&D in India

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Linköpings universitet  
TEKNISKA HÖGSKOLAN

Master Thesis LIU-IEI-TEK-A--12/01553--SE  
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# Executive summary

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## *Background*

In today's society with globalized markets and communication solutions facilitating a global workspace, value chains are increasingly spread out over national and continental borders. Multinational companies' activities are located in accordance to optimal value creation from available resources and strategic importance. Where the traditional reason for offshoring lower value adding activities like manufacturing and back office functions have been access to low cost labour the situation today is different - especially for more advanced operations like R&D.

While the markets in the western world are becoming more saturated and on top of that affected by financial downturn, the global economic focus is shifting rapidly towards Asia. India as the second largest country of the continent and with a quickly increasing welfare status has therefore emerged as an important strategic location for business activities of different scopes ranging from sales- and back end functions to R&D. Where the western world is losing interest in technical educations and professions, India is quickly taking a leading position when it comes to alternative locations for Swedish companies' R&D activities due to the amount of collective knowledge and skilled labour. To be able to maintain and stimulate the competitiveness of the domestic industry it is of importance for the Swedish authorities to understand the reasons behind Swedish companies' reasons to locate R&D activities abroad in countries such as India.

## *Purpose*

The purpose of the thesis is to study the major factors behind Swedish companies' decision to conduct research and development activities in India and which role the Indian research and development play in the present and future global R&D strategies of these companies.

## *Methodology*

A case study was conducted in India for the Swedish Agency for Growth Policy Analysis at the agency's local office at the Swedish Embassy in New Delhi. The study consisted of interviews with representatives of the chosen case companies Ericsson and Volvo as well as complementary interviews with the Swedish Trade Council and the Swedish Chamber of Commerce. The aim of the interviews was to gain understanding of these companies' strategies for R&D placement and India's role in these by acquiring an understanding of the major factors influencing these decisions.

## *Results*

The globalisation of markets paired with mature home markets have a great impact on the case companies' decision to expand their R&D to new and faster growing markets such as India, to keep a forward going momentum and further the expansion of the company. As the companies grow internationally they also need more R&D staff to keep their technological edge and also to be able to find and answer to the local demand. The fairly large increase of employed workforce is hard to facilitate by the number of viable personnel available in the home market and is more easily carried out in countries with a higher amount of engineers.

Cost benefits are deemed a major factor for general expansion of jobs to lower cost countries, but when it comes to high value functions like R&D the cost factor's importance decrease and is replaced by the need for skilled labour and knowledge resources that can, and will cost more as long as the resulting outcomes provide high quality. This is the case with India, where well educated labour like engineers exist in abundance and is, generally

cheaper than in the western world. The Indian market is deemed very important both now and in the future, so R&D departments are set up in India to gain access to the domestic market. As the Indian culture and market climate is so different from the home conditions there is also a need for local R&D and access to local market knowledge to be able to properly utilize this market's potential. The country specific business conditions are seen as mostly favourable in India and the regional Indian authorities are actively trying to get foreign companies to India by offering attractive business conditions.

The Indian R&D is of an increasing importance for Swedish companies, even if it's still on a smaller scale compared to the work being done in more mature markets. Research is generally kept close to the headquarters while development activities tend to be more scattered and both case companies have large scale development activities in India. The future is predicted to be much more global and decentralized for large companies, even on a management level. While strategic hubs will be maintained in countries of origin there are plans to decentralize strategic operations like R&D to better utilize the different knowledge bases around the world. The usage of IT-systems decreases the relevance of geographical localisation of R&D worldwide - another factor that facilitates a decentralized workspace. Important to have in mind is that an expansion of R&D in India does not automatically mean a reduction of these activities in Sweden, a country that after all is quite well prepared to face the new challenges the future will bring.

# Preface

Reading newspapers today always bestow a feeling of paranoia. Hasty conclusions are drawn around the emerging economies and our own obsolescence in the western world. They took our jobs! Their birth rate is astronomical! They are investing a lot of money in their military! And of course they are a strange bunch with an alien culture that we will never understand, right?

Sitting around the lunch table at a University usually brings up interesting debate topics about most things. Discussing school related topics and comparing them to the real and the newspaper-projected world is almost a sport around campus. As students of Industrial Engineering and Management the discussions more often than not centers on business topics like the changing economic power in the world. And the longer into the education, the more it feels like we can add meaningful substance to further the discussions.

It's long been said by professors, economists and government officials that the Swedish economy should be knowledge based. The outplacement of manufacturing processes is seen as a loss but more important it seems, is the retention of high value generating operations that need high competence and experience, areas where Sweden for a long time has had a prominent position. But what happens when the educational levels in emerging economies increase while our own base of students in science, technology, engineering and mathematics is shrinking rapidly due to a low interest for these subjects amongst Swedish students?

Due to our own strong interest in both international and societal matters it has been wonderful to have had the opportunity to combine those interests with the knowledge we have gained through our education to produce this thesis for the Swedish Agency for Growth Policy Analysis at the Swedish Embassy in New Delhi. Yes, the process has been a long one, but it has been a wonderful time with much fun and learning. Some of this is written in this paper but most of it - like how to ride a Camel or bargain for vegetables, is securely stuck inside our heads.

We want to give thanks to the Swedish Agency for Growth Policy Analysis for inviting us to take part of an Indian adventure and giving us the time and help needed to conduct the study. A special thanks goes to Andreas Muranyi Scheutz, supervisor and mentor at the agency's office in New Delhi. We would also like to thank the rest of the embassy staff for making our stay a very warm experience and for providing us with enough sweets to last for a lifetime. The respondents in our study also deserve much gratitude - without them taking time off from their important roles in the case companies the thesis would have been for naught. Our supervisor Claes Moberg at Linköping University has, together with our critic Malin Wallin done a great job of keeping our feet on the ground and has with an astounding attention to detail provided us with ways of improving our work. Sadiq Kazmi deserves the warmest gratitude for being a great friend and showing us sides of India and New Delhi that we would never have seen otherwise and our last thank you goes to our housemates "the Frenchies" for only partying four nights a week and giving us a few hours of precious sleep now and then!

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Kajsa Olofsson  
2013-01-15

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## TABLE OF CONTENTS

<b>1</b>	<b>PROJECT INTRODUCTION .....</b>	<b>1</b>
1.1	PROBLEM INTRODUCTION .....	2
1.2	BACKGROUND .....	3
1.3	PURPOSE OF THE STUDY .....	6
1.4	THESIS OUTLINE.....	6
<b>2</b>	<b>FRAME OF REFERENCE .....</b>	<b>7</b>
2.1	GLOBALIZATION OF VALUE CHAINS.....	8
2.2	RESEARCH AND DEVELOPMENT .....	18
2.3	OFFSHORING OR OFFSHORE ESTABLISHMENTS.....	24
<b>3</b>	<b>MODEL FOR ANALYSIS .....</b>	<b>32</b>
3.1	MODEL FOR ANALYSIS .....	33
3.2	SPECIFIC RESEARCH QUESTIONS .....	37
3.3	DELIMITATIONS.....	37
<b>4</b>	<b>METHODOLOGY .....</b>	<b>38</b>
4.1	RESEARCH APPROACH .....	39
4.2	THE PROCESS.....	39
4.3	LITERATURE STUDIES TOWARDS A FRAME OF REFERENCE.....	40
4.4	GATHERING OF DATA TOWARDS AN EMPIRICAL FRAMEWORK .....	41
4.5	ANALYSIS AND THE WAY TO CONCLUSIONS.....	42
4.6	SOURCE CRITICISM .....	42
4.7	SOURCES OF ERROR .....	42
<b>5</b>	<b>EMPIRICAL STUDY .....</b>	<b>44</b>
5.1	CASE STUDIES .....	45
5.2	ADDITIONAL EMPIRICAL INFORMATION.....	56
<b>6</b>	<b>ANALYSIS.....</b>	<b>61</b>
6.1	DRIVING FORCES .....	62
6.2	DESIRED OUTCOMES.....	64
6.3	CURRENT R&D STRATEGIES .....	66
6.4	THE INDIAN BUSINESS .....	67
6.5	FUTURE PROSPECTS FOR LOCALIZATION OF R&D ACTIVITIES .....	69
<b>7</b>	<b>CONCLUSIONS &amp; DISCUSSION .....</b>	<b>72</b>
7.1	CONCLUSIONS .....	73
7.2	DISCUSSION - SWEDEN'S ROLE IN A GLOBAL WORLD.....	75
7.3	USABILITY OF THE MODEL OF ANALYSIS .....	77
	<b>REFERENCES.....</b>	<b>78</b>
	LITERATURE .....	78
	OTHER SOURCES.....	81
	ELECTRONIC REFERENCES .....	81
	INTERVIEWS .....	82
	<b>APPENDIX.....</b>	
1.	INTERVIEW GUIDE.....	
2.	KLAS EKLUND ON THE FUTURE OF SWEDISH JOBS .....	

# Table of figures

FIGURE 1 - INDIAN FEDERAL STATES .....	3
FIGURE 2 - SWEDISH COMPANIES' ACTIVITIES IN INDIA .....	4
FIGURE 3 - GLOBALIZATION.....	8
FIGURE 4 - INTERNATIONALISATION OF MARKETS .....	9
FIGURE 5 - PORTER'S VALUE CHAIN .....	10
FIGURE 6 - VALUE CHAIN AS A SMILE CURVE .....	11
FIGURE 7 - VALUE CHAIN AS SMILE CURVE #2 .....	12
FIGURE 8 - PORTER'S VALUE CHAIN #2.....	12
FIGURE 9 - DIVISION OF ACTIVITIES IN THE VALUE CHAIN.....	14
FIGURE 10 - THE DIAMOND .....	15
FIGURE 11 - R&D CONTINUUM .....	18
FIGURE 12- ORGANISATION OF R&D UNITS .....	20
FIGURE 13 - TRENDS IN ORGANISATION OF R&D.....	22
FIGURE 14 - STRATEGIES FOR OUTSOURCING AND OFFSHORING .....	25
FIGURE 15 - MODEL OF ANALYSIS.....	34
FIGURE 16 – U - MODEL .....	39
FIGURE 17 - METHOD FOR THESIS WORK.....	40

# List of abbreviations

*There are a few terms and abbreviations that are used frequently in the thesis:*

**R&D:** Research & Development - Activities aimed to research new technologies and to develop new products, services or processes.

**ICT:** Information and Communication Technology - in some cases also written as IT, are technologies developed for communication and sharing of information. A basic ICT is a phone that enables communication between two parts and more advanced applications are databases or applications using the internet for communication.

**FDI:** Foreign Direct Investment - a direct investment into production or business in a country by a company in another country, either by buying a company in the target country or by establishing a new operation or expanding operations of an existing business in that country

# 1

## Project introduction

*This chapter aims to give an overview of the thesis topic and the setting within the thesis work has taken place. Following an introduction to the topic of the study and directives from the commissioning body, a purpose for the study is presented.*



## 1.1 Problem introduction

Despite ages of international trade over national borders and continents the world we live in today is in many ways facing a higher degree of interconnection and dependency than ever before. It is no longer possible to talk about isolated economic systems but rather does the world economy make up interplay for utilisation of competence, finances and scarce resources, all put together in global processes for value creation, globalized value chains.

As Porter (1985) describes, a company's value chain consists of a system of interdependent activities such as R&D, manufacturing and sales, which together are generating value in form of a product or solution developed in the end of the chain. With localisation of activities based on access to resources and levels of cost rather than geographical origin or closeness to stakeholders, the value chains have become a global and in some aspects even virtual phenomena (Baldwin & Venables, 2011). This has also led to increased unbundling of activities in the production chain where not only primary functions (Porter, 1985) such as manufacturing and sales are placed separated from the headquarters, but also operations like research and product development.

The decentralization of activities throughout the value chain is a major part of multinational companies' international strategies where actors and even whole industries focus on realisation of particular activities which maximize the value creation derived from resources and conditions available (Baldwin & Venables, 2011) Altogether this has given birth to the phenomena of offshoring where companies are sourcing activities such as R&D at widespread locations where the outcomes for these operations are used on respective local market as well as on a global scale. Major reasons for this offshoring have traditionally been access to resources and labour to lower costs but factors as access to a skilled workforce has lately become more prominent, especially for more advanced activities such as R&D (Lewin et al 2009). A close connection to customers for understanding of demands and local circumstances is further still important for the realisation of R&D despite the increased international connectivity and globalization (Pearce, 1999), something which also affects the localisation of these activities.

India has in later years emerged as major actor in the global economy with the world's second largest population and a continuously increasing welfare status for a rapidly growing middle class. Apart from this, the country has also arisen as a leading destination for offshoring activities. Many Swedish companies have since longer or shorter time activities located in India, both for marketing and sales purposes and to a higher extent also for performing R&D. With a continuing challenge of maintaining competitive advantages in high-tech areas in Sweden when the interest for studies in sciences, technology, engineering and mathematics (STEM) is decreasing and many low cost alternative locations rise in levels of competence, Swedish' companies placement of high-value activities abroad is a delicate question. Does the foreign localisation of R&D operations substitute prior activities in the home country, here Sweden, or is it rather an indication on a complementary growth and inclusion of external and internal technical expertise? (Belussi and Sedita, 2010)

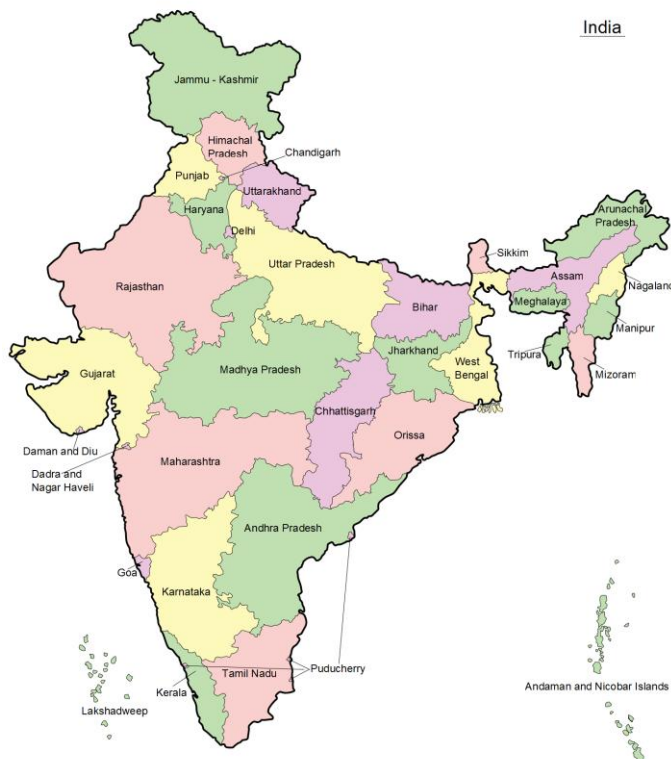
## 1.2 Background

### 1.2.1 India

India is a federal republic with parliamentary democracy, divided into 28 federal states that all have their own governmental reign. The central government is in charge of areas such as foreign policy, defence, national development plans and currency value whereas the federation states are responsible for health care, public transportation, educational system etc. (Länder i fickformat, Indien, 2010)

India has a population of 1.2 billion people, where approximately 30 percent live in urban areas and the remaining 70 percent in rural areas. India has a young population, around 65 percent are in the age group of 15 - 64 years and the median age is 26.2 years. There are 21 official languages in India, including English which is widely used in national, political and commercial communication (Ernest & Young, 2009). General literacy rate is 74 percent and India has one of the largest school-age populations in the world with around 130 million students (Mitra, 2007)

The Indian economy was for a long time closed, centrally planned and highly regulated. In the beginning of the 1990's, under pressure from financial deficit and high inflation rates, reforms were gradually introduced, opening up the Indian economy and stimulating foreign investments. Since 1992 the Indian GDP has had an annual growth of 5.8 per cent on average (Muranyi Scheutz, 120830). Today India is ranked as number 10 in the world economy but is forecasted to be on place 3 in year 2050 (by GDP). The fastest growing sector during the last 20 years is the service sector, which in year 2009 stood for 63% of the Indian GDP compared to 20% for manufacturing and 17% for the agricultural sector. As a part of the service sector, India did in 2009 take charge of approximately 50% of all globally outsourced IT services ranging from simple IT functions to business and knowledge process outsourcing (Indian Fact Pack, 2010)



### Facts about India

*Population: 1,241,491,960 (2011)*

*Area: 3,287,263 sq km*

*Capital: New Delhi (Dehli, 12,6m), other big cities: Mumbai (13,8m), Bangalore (5,4m), Kolkata (5,1m)*

*GDP total: 1.848 trillion USD (2011)*

*GDP PPP: 4.457 trillion USD (2011)*

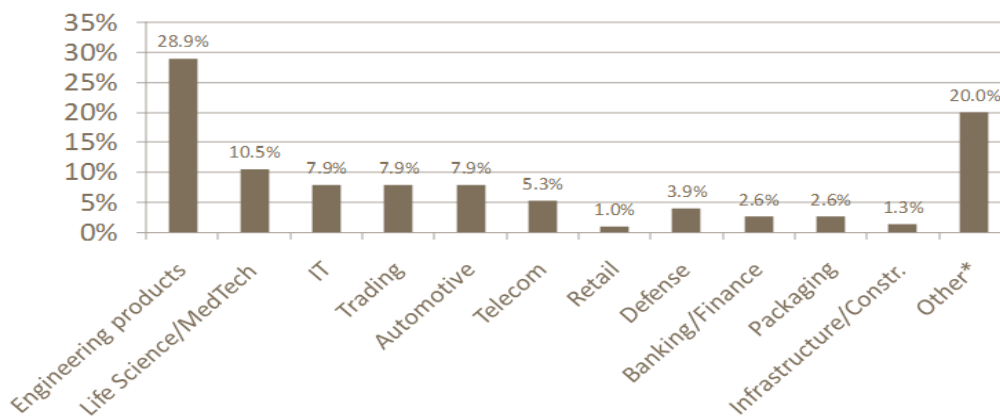
*GDP/capita: 1.388 USD*

(Worldbank, 2012)

Figure 1 - Indian federal states (Indian Fact Pack, 2012)

### 1.2.2 Swedish companies present in India

Swedish companies have established business in India since the beginning of the 20th century. Among the first Swedish companies establishing business in the country were Ericsson, SKF and Swedish Match, later followed by Alfa Laval, Tetra Pak and Sandvik that established business units in the country during the 1960-70s. During the 1980-90s purchase departments of companies like IKEA and H&M were established in India. During the last 20 years more Swedish companies, ranging from small to medium sized enterprises (SMEs) to larger, global actors have established units in India. In 2009 135 subsidiaries of Swedish companies were registered in the country. Apart from these, many others (1200 companies in 2009) are involved in business activities in India, all together engaging around 300 000 employees in 2009 (Swedish Trade Council, 2012). During the period 2009-2011 Swedish companies invested in total more than 1 billion SEK in India, a number forecasted a significant increase over the coming years (Sweden-India Business Guide, 2011). Swedish companies are mainly located in the big industrial cities in India such as Delhi, Mumbai, the Gujarat region and the south region comprising Bangalore, Chennai and Hyderabad. The main distributions of sectors where Swedish companies were present in 2011 were as follows in figure 2 below.



**Figure 2 - Swedish companies' activities in India (Business Climate Survey, 2011)**

Activities related to sales and marketing for the Indian market are, together with manufacturing operations targeted for the local market still counts as a major part of the activities Swedish companies are undertaking in India. Recent trends however show an increase in industrial production with use also for the regional and global market. Many Swedish companies have research or development units located in the country which primarily deal with adaptation and creation of products and processes in order to meet specific demands from the Indian market. Parts of the R&D conducted does also concern global projects and in some cases the product solutions developed for the Indian market can also be of use in other international markets. The opportunity to be close to the local market is generally the main reason for having business units located in India, even if the market conditions in the country are rather different compared to those in Europe. Thanks to the economic growth in India large investments have been directed in to infrastructure development, which has been profitable for many Swedish companies present in India, as these investments create a demand for technical equipment and components in, e.g. the construction and automotive sectors. In this perspective it is favourable for the companies to be present in the Indian market in order to make it possible to provide and develop the requested utilities (The European Business Group India, 2012).

### **1.2.3 Swedish Agency for Growth Policy Analysis**

This thesis has been conducted in cooperation with a commissioning body, the Swedish Agency for Growth Policy Analysis. Here follows a brief introduction and an explanation of the agency and the role of this thesis in the organisation's work.

The Swedish Agency for Growth Policy Analysis (Growth Analysis) is working on behalf of the Swedish Government in order to follow and analyse economic growth and development in Sweden and other countries/regions around the world. The information and analyses, which create a basis for political decisions in the Swedish Government and Parliament, aims to strengthen the country's competitiveness.

Growth Analysis is working to raise awareness on global conditions for economic growth by presenting evaluations, analyses and "reflections" regarding present conditions and developments. The international relations and operations as well as the foreign offices within the agency are organised within the Department for Innovation and Global Meeting Places. The function of the department is to provide analyses and evaluations which contribute to the development of growth policy decisions and activities in Sweden based on awareness of international conditions.

### **1.2.4 The role of our thesis work**

This thesis work provides a case study based on a small number of Swedish companies acting in India, which relates to the Swedish Agency for Growth Analysis work with global value chains. From the Swedish government (Tillväxtanalys (b) 2011) Growth Analysis has got an assignment to analyse and provide increased understanding of global value chains, their underlying driving forces as well as their impact and consequences for Sweden's competitiveness and future growth policy. This will partly be investigated with a study based on international structures for trade and investments, which Swedish companies are affected by and involved in. Within this field, Growth Analysis aims at investigating and analysing the driving forces behind and effects of Swedish companies' foreign localisation of R&D activities and its relation and effect on global value chains. The thesis will here serve as reference providing empirical information and reflections on Swedish companies' approach to and experiences from localisation of R&D in India.

The thesis is structured as a case study focusing on provision of qualitative information about the reasons behind and effects of Swedish companies' location of R&D in India. The study aims to look into conditions affecting the R&D activities located in the country and also to investigate the connection to the global scope of activities carried out by the companies. The study will hence primarily take an internal perspective. This aims to shape a base of understanding and empirical data from which further reflections and analyses on can be carried out.

## 1.3 Purpose of the study

Following the globalization of the world economy and the increased opportunities to spread out operations such as R&D, strategies for multinational companies do in many aspects cover localisation and integration of activities across the globe. India has in this aspect emerged as a crucial player as target for foreign investment and localisation of functions with strategic importance. From Swedish companies' perspective India is, with a large population and growing importance as a world economy player, therefore not only an important market to be present on but also an interesting alternative for sourcing of activities. In order to give decision makers in Swedish authorities and companies a better understanding of the origin and future outlooks of this phenomena this thesis aims to investigate the following:

*This thesis will study the major factors behind Swedish companies' decision to conduct research and development activities in India and which role the Indian R&D plays in the present and future global R&D strategies of these companies.*

## 1.4 Thesis Outline

### Frame of reference

This chapter provides an overview of available literature and theories related to the topic of the thesis. This part intends to give a theoretical background for the empirical study and further analysis.

### Model for Analysis

Derived from the theoretical framework the model for analysis serves as frame for further investigation of the study's purpose in terms of collection of empirical data and following analysis. From this model more specific research questions are compiled which serve as a starting-point for the interviews in the empirical study.

### Methodology

This section presents the methodology used in the thesis including the reasoning behind the accuracy for the working-methods chosen for the study.

### Empirical study

This chapter presents the empirical findings from the interviews conducted with the case companies and other actors of relevance for the study.

### Analysis

The analysis examines the empirical findings based on the theoretical framework in the frame of reference and the model of analysis.

### Conclusions and discussion

Answering to the research questions, this section aims to provide concluding remarks over the findings in the study. The second part of the chapter brings up a reflection over the results from the study and the general thesis work accomplished.



# 2

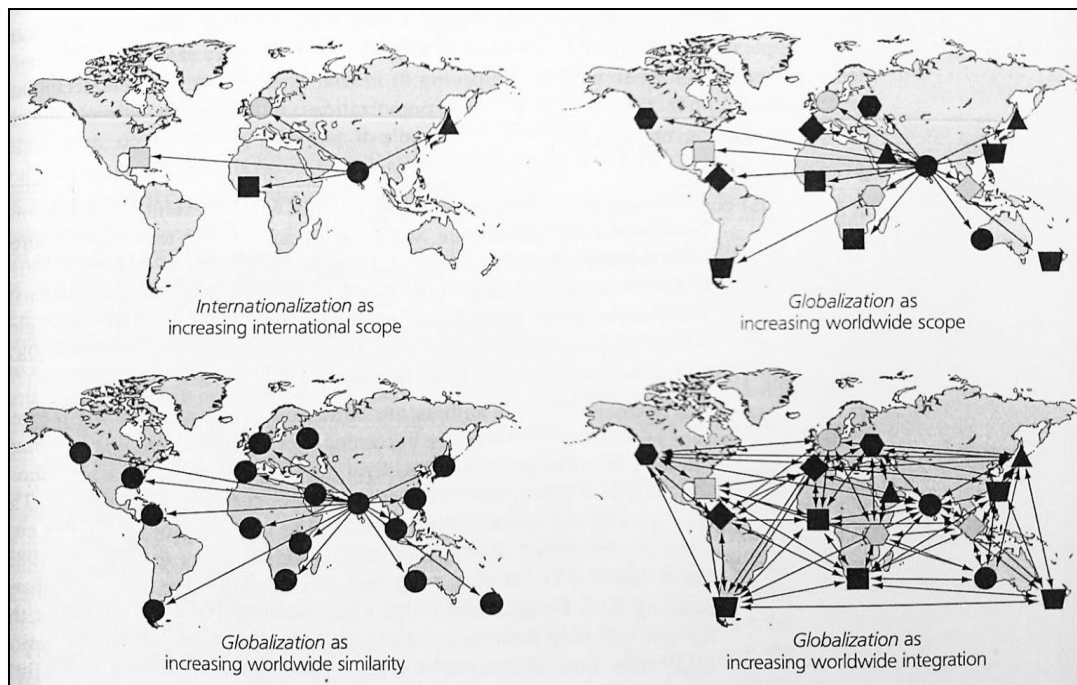
## Frame of Reference

*This section presents a theoretical framework assembling relevant theories with connection to the research area introduced in the purpose of the study. These theories are meant to give an overview of the current literature in the field which serves as a base for the construction of a model of analysis for and further analysis of the empirical data. As the study is part of a larger framework of knowledge building around global value chains the frame of reference takes a starting point in this phenomenon. Further follows an overview of historical and present trends for localisation of companies' research and development activities as well as general drivers and desired outcomes for offshoring of operations.*

## 2.1 Globalization of value chains

Globalisation is a very wide term that is used to describe a world-spanning phenomenon in a variety of different contexts. In a business sense the word is a term explaining international interchange and integration of ideas, information and goods. International trade with material and goods transferred over international borders has been present for ages, but the amount of global integration and interdependency across national borders and companies we see today have rather emerged during the last decades (Baldwin & Venables, 2011). An international scope of business activities is by De Wit and Meyer (2010) referred to as activities and trade that is connecting actors located abroad. The phenomenon of globalization is rather presented as an emerging pattern of increased international interaction described in the following steps:

- *a geographical expansion of the company's operations towards locations on an international scale*
- *a homogenous international market following an increased interaction initiating similarities in market conditions in many regions and countries across the world*
- *a network of multinational actors and geographically spread markets which are tightly linked to and influenced by each other's (see figure 3)*



**Figure 3 - Globalization (de Wit and Meyer, 2010, p. 541)**

In this thesis, globalization is seen in the light of global value chains and more specifically the localisation of activities therein. Literature in this field refer to the perspective of globalization as a crucial part of company strategy and not only for activities directly targeted at foreign markets but as an underlying variable affecting decisions regarding various kind of activities taking place in the organisation (Rosencrance, 1996; Douglas & Craig, 2010). De Wit and Meyer (2010) refer to globally shared dynamics for technological and economic development, where Porter (1986) describes the globalization process as an international use and evolution of a company's core operations. Furthermore, a global perspective is important for enabling strategic evolvement and the creation of new internationally competitive advantages even if the advantages may decrease in the encounter with foreign conditions and competition. Belussi and Sedita (2010) view globalization as a strategic organisation of internal and external activities

spread out on different geographical locations around the globe concerning coordination of activities in subsidiaries, business alliances and outplaced activities. Reaching a unified strategy for globalization can be difficult for companies due to the diverging speed of international integration within respective level of operations (see figure 4). The financial market presents a highly internationalised context with global trade and transitions of capital among tightly linked national economies and currencies. Trade alliances and policies spanning over national borders create a regional (or international) focus for handling of goods and services. The labour market is still in many aspects a national business; demographical conditions influence the access to workforce and domestic policies and governmental decisions also have an impact on aspects like labour mobility and educational level (Buckley and Ghauri, 2004).

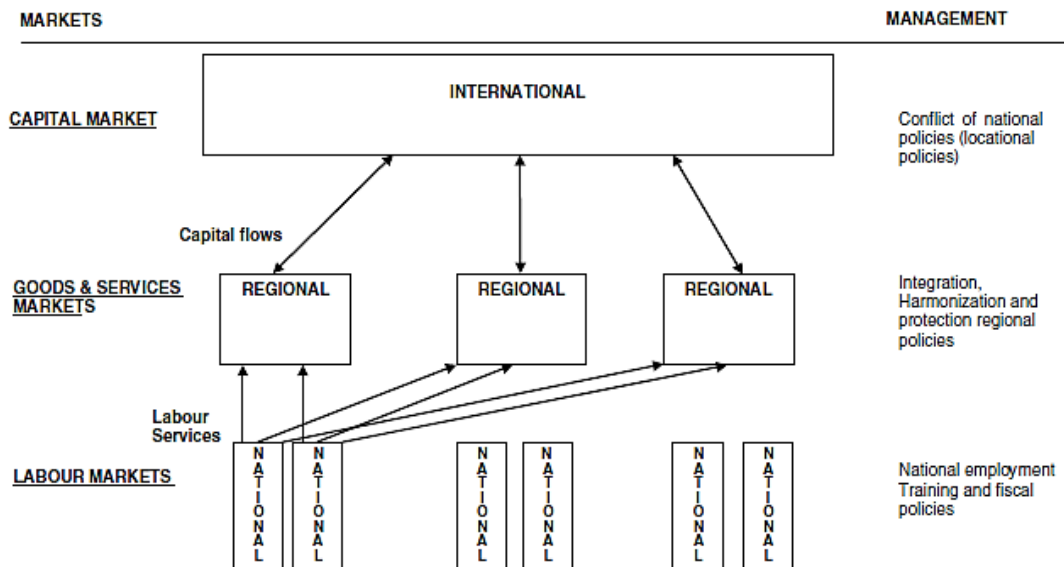


Figure 4 - Internationalisation of markets (Buckley and Ghauri, 2004, p. 82)

### 2.1.1 Global value chains

Activities carried out from the initial extraction of raw material to the final delivery of products and services to the customer can be described as a process of value-adding operations, a value-chain. These activities may all take place within one single company but are more often carried out by unbundled producers and service providers that extract raw materials, develop and manufacture parts and components, assemble the products and transport the goods across different locations (Tillväxtanalys (a), Tillväxtanalys, Tillväxtverket, 2011; Belussi & Sedita, 2010). The concept of value chains relates to a certain level of intentional integration and coordination across different functions. International trading activities are as an example not classified as elements in a global value chain even if these operations take place in a global context. The involved actors are here mainly linked through the interdependencies from the flow of goods and finances such as market demand, price mechanisms etc. while the development of new technology and products require a closer coordination and integration (Tillväxtanalys (a), 2011). This reasoning is in line with Porter's (1986) original definition of the concept where the activities making up the value chain are related to the product or service creation process (see figure 5). Primary functions for the physical creation of products or services as logistics, manufacturing, marketing and sales are supported and influenced by operations such as human resource management, technology development and other internal structures and processes. According to Greenaway, (2012) the inclusion of support functions also define the distinction between value and supply chains as the later mainly focuses on pure production and transportation related activities.

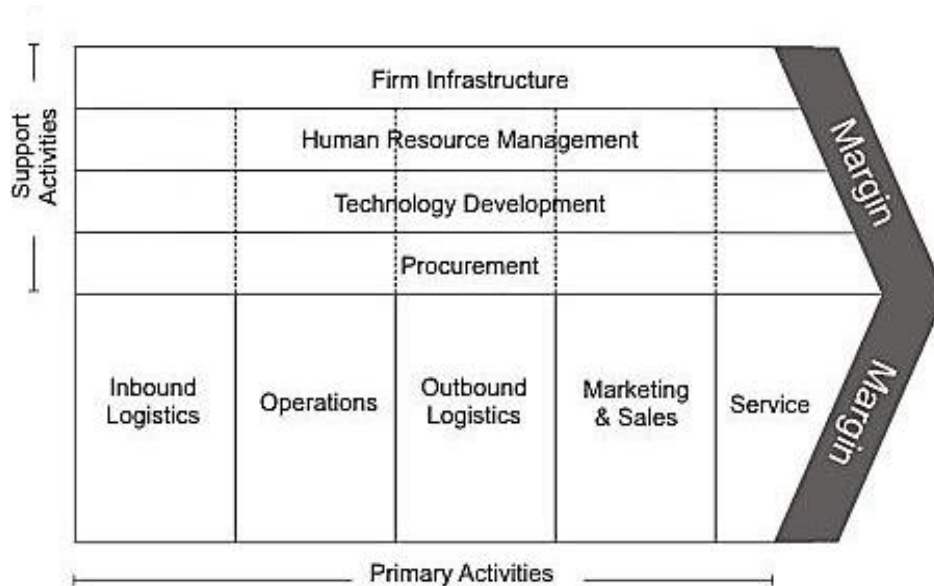


Figure 5 - Porter's value chain (Porter, 1986, p. 14)

### ***Development of value chains – an historical overview***

The rise of international value chains, with production unbundled from the access to natural resources or closeness to end-customers were first released in the rise of the industrialization era. Placement of factories became more flexible thanks to enhanced transportation opportunities (the first railroads and later air cargo and enhanced supply chain management) (Baldwin & Venables, 2011). Following this development, the production process diffused from a local scale to a wider, international level with operations spread over larger geographical distances (Greenaway, 2012). Geographical conditions, which before had generated trading activities based on export of locally extracted and manufactured goods could now give competitive advantages in more specific stages in the production chain (Porter, 1986). Factors like natural resources and access to labour generated roles as supplies and producers with diverse functions in the value creating process (Greenaway, 2012; Baldwin & Venables, 2011).

The increased geographical spread of activities leads to a need for coordination of activities along the different production stages and the respective involved actors. With the introduction of internet as mean for facilitated coordination and communication a second level of unbundling in the value chain was made possible (Greenaway, 2012) and as a consequence, the organisation of value chains changed into a global phenomenon where activities easily could be organised and coordinated over long distances (Baldwin & Venables, 2011). The IT-revolution has also resulted in a shift in cost focus from supply of resources to expenses related to coordination and integration of activities.

### ***Global value chains today***

According to Baldwin and Venables (2011) global strategy today includes localisation and integration of domestic and offshore-located functions with activities targeted for the local as well as the worldwide market. Rapidly changing circumstances for achieving competitive advantages on an international scale is another aspect of global strategies brought up by Porter (1986) that is surprisingly accurate in the modern world. Factors that once made up a profitable business conditions at certain locations can quickly be outmoded on behalf of other criteria. The threat from other locations appearing as competitive alternatives for placement of activities (mainly due to lower costs) also influence the need to continuously overlook and develop global strategies.

Access to assets like knowledge, labour, capital and technology is now of higher importance for creation of economic value rather than a supply of natural resources which historically had a greater impact (Rosencrance, 1996; Porter, 1986). An example of this is the placement of manufacturing units, which nowadays are based at locations associated with low production costs rather than access to raw material (Mudambi, 2008). The location of activities does, according to Porter (1986), in a wider perspective also affect the origin of economic competitiveness of whole nations. Countries where knowledge and capital intensive activities are located can then be referred to as “head” states whereas “body” states’ economic value is derived from extraction of raw materials and performance of manufacturing related activities (Rosencrance, 1996). The higher-value activities have mainly been carried out in advanced market economies whereas lower value-adding and more standardised activities have been concentrated to emerging markets. Mudambi (2008) illustrates the distribution of value adding activities in the value chain through a model graphically corresponding to a smile (see figure 6). Lower value adding activities in the middle of the value chain such as manufacturing, are primarily located at places with lower operational costs whereas high value activities in the early and late phases of the value creation are to a higher extent located in more advanced markets. The localisation of each activity follows an optimization of cost and value creation across all steps in the chain. Greenaway (2012) uses the same parable in order to visualise the shifting perspective of value creation from a focus on production (1970s) towards a higher importance given to activities in the pre- and post-production stages symbolizing the 21st century (see figure 7) (Mudambi, 2008; Belussi & Sedita, 2010). The recent shift towards an increased decentralisation and foreign outplacement of more strategically important activities (Belussi & Sedita, 2010) can be seen as a natural effect of Porter’s (1986) idea that competitive advantages depend on ability to coordinate and integrate internationally spread activities rather than the actual location of the same.

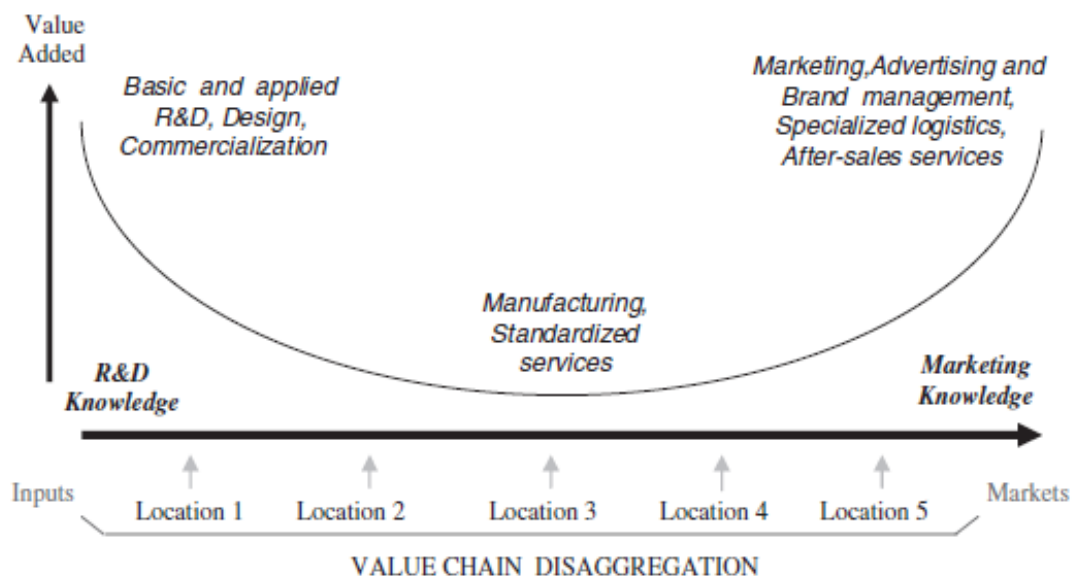


Figure 6 - Value chain as a smile curve (Mudambi, 2008, p.707)



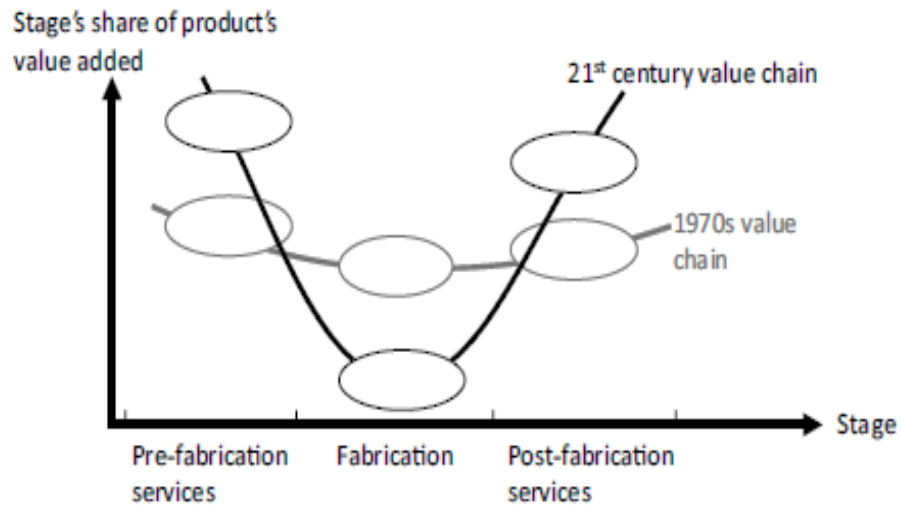


Figure 7 - Value chain as smile curve #2 (Greenaway, 2012, p. 90)

### 2.1.2 Localisation of activities in the global value chain

The organisation of activities in an international organisation is, according to Porter (1986), a matter of configuration or geographical placement of the units making up the value chain. For activities with closer connection to the customers, such as sales and after-purchase it is more important to have the units located close to the geographical market to build a presence in the customer's mind and reach out with targeted offers. Core activities, or upstream activities, can be located away from the market, rather utilizing an optimal access to resources and value creation. The localisation of functions can utilize alternatives ranging from centrally concentrated units to a dispersion of activities in several countries. The coordination of activities on the other hand refers to the integration of shared standards, processes and communication among different units.

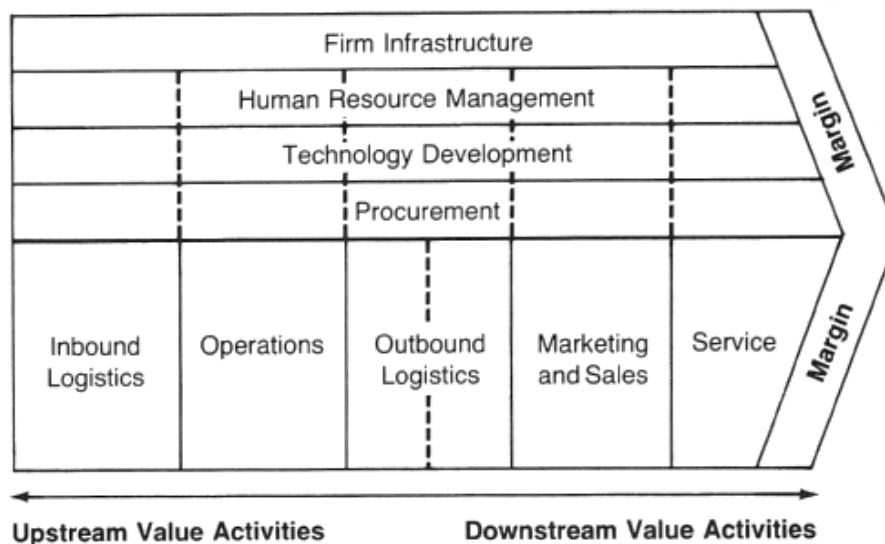


Figure 8 - Porter's value chain #2 (Porter, 1986, p. 16)

Greenaway (2012) argues that a geographical dispersion of activities in the value chain is driven by factors such as lower costs and increased access to competence and resources. On the other hand, benefits

from closeness to other actors in the value chain as well as customers on target markets may stimulate a concentration of activities. Drivers for concentration of activities at one or few locations are possible economies of scale, synergy effects from co-location of activities and lastly access to resources, expertise and comparative advantages for realisation of activities at the location. With a higher concentration of activities the need to coordinate and adapt to various managerial interests in diverse subsidiaries also decrease (Greenaway, 2012; Porter, 1986). The possibility of concentrating flow and to use the information and competence as a benefit derived from centralised activities is addressed by de Wit and Meyer (2010) who believe it will generate potential economies of scale. On the other hand, Porter (1986) mentions disadvantages from the concentration of activities in the value chain in one or few countries, since it is costly and an inefficient use of activities and resources. Political and economic risks should also be higher with higher concentration. One should also bear in mind that conditions and comparative benefits from concentration and dispersion of activities do vary for the different functions in the value chain.

In order to reach a close relation with customers in each market, subsidiaries taking care of downstream functions should be initiated in each country where the company is present. For upstream activities originating from earlier steps in the value creation chain (inbound logistics, technology development, operations etc.) the closeness to the customers is of less importance. Instead configuration and integration of primary activities and support activities through organisational-wide systems are of higher importance for generation of value and competitive advantages. In technology and knowledge intensive industries Greenaway (2012) refer to closeness to and integration with clusters as an example of activities aiming on enhanced integration and value creation such upstream activities.

By integrating processes for sourcing of material, marketing, infrastructure and inter-organizational learning the internal coordination among widespread functions is made possible on an international scale (Porter, 1986). IT solutions also reduce the need for concentration of higher value adding activities that require much more integration. Increased modularisation in the production process (Baldwin & Venables, 2011) and a transfer towards more service based organizations and offers have opened up for work to be carried out from different locations simultaneously. This possibility to place more specialised activities and functions in widespread locations opens up for new economies and actors to take a more prominent role in the global value chains. Increased opportunities for international cooperation also provides access to a larger amount of markets that have prior been out of reach due to limitations such as geographical distance (Tillväxtanalys (a), 2011). Worldwide increase of outsourcing and offshoring and through changed patterns for export and import are some examples showing the effects from the eased geographical spread of activities in the value chain (Baldwin & Venables, 2011).

Localisation of activities to foreign countries, often emerging economies, has lately spread to more knowledge intensive operations like services and R&D. This lead to an updated version of the "smile model" explained before. The newer version, called the lambda model, places the value adding activities in different locations according to the level of market development in terms of industrialization and modernization at the y-axis and the stage in the value chain at the x-axis (Belussi & Sedita, 2010) showing the background to the increasing outplacement of activities in foreign countries or even to external actors described by Baldwin & Venables (2011).

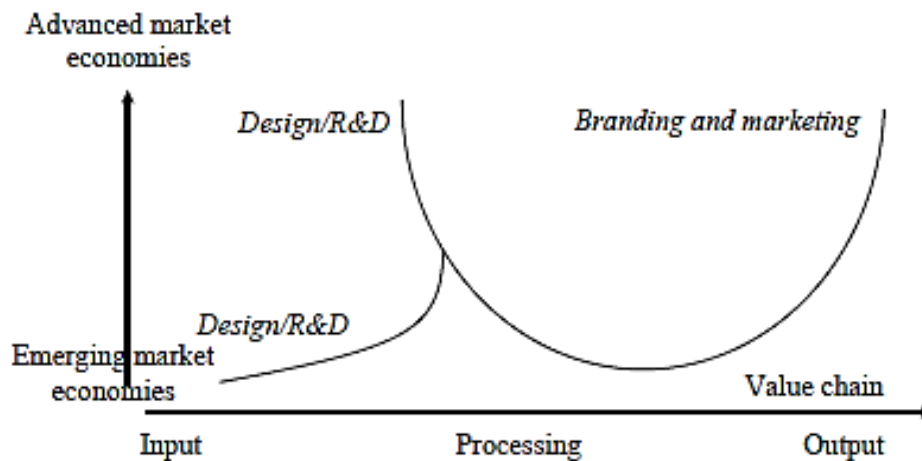


Figure 9 - Division of activities in the value chain (Belussi and Sedita, 2010, p. 412)

### 2.1.3 Integration and standardisation of activities within the value chain

In line with the discussion about globalization and conflicting managerial interests among different levels of the value chain, balancing locally and globally focused strategies within multinational companies is a constant challenge according to Buckley & Ghauri, 2004, an argument that also lies close to Porter's (1986) view. Both Buckley & Ghauri (2004) and de Wit and Meyer (2010) argue that global standardization of activities can be applied along the whole value chain. This follows the intention to have processes carried out in a similar way across functions and locations, ranging from production to marketing and product offers and the desired effects from such an organization are for example the achievement of cross-border synergies, more efficient realisation of activities, lower costs and economies of scale. Buckley and Ghauri (2004) write that the standardization of processes also requires organisational structures and internal processes for facilitated implementation of the strategies. This can be more difficult to achieve with geographically spread operations, especially if there are distinct local variations in organisational structure and working methods in different subsidiaries and units.

Both De Wit and Meyer (2010) and Porter (1986) mention that multinational clients many times demands a unified offer across different application areas in order to ease prediction, adaptation and standardisation of the integration and use of these products and services bought. However, Wind (1986) argues against too much focus on global standardization as it builds upon the assumption that the market conditions across the world are becoming more homogenized, something that is not necessarily true. Douglas and Craig (2010) also argue that there is a growing diversity among developed and emerging markets, providing a heterogeneous business climate. With diverse market conditions, also within countries, a too integrated strategy adapted for coverage of a global market is unlikely to be successful. Diverse strategies and offers with higher level of understanding and adaptation to local conditions are instead crucial for international

companies that want to compete with offers from local actors, especially for emerging markets. These insights may, apart from closeness to customers, also rise from usage of local resources such as know-how generated from domestic workforce (Douglas & Craig, 2010). Closer local connections to stakeholders and potential customers across activities in the value chain also reduces unfavourable conditions rising from the occupation of the position as a foreign and uneven actor on the market (Johanson & Vahlne, 2009)

#### 2.1.4 The impact from domestic conditions in the localisation of operations

Porter (1990) refers to the importance of understanding and adapting to domestic conditions for the establishment of business activities in a different country. This affects decisions regarding organisational structures of subsidiary functions and standardisation of activities therein. The attributes of these conditions shaping a nation's competitive advantage for location of activities can be divided into the following dimensions, forming a model called "the diamond", see figure 10:

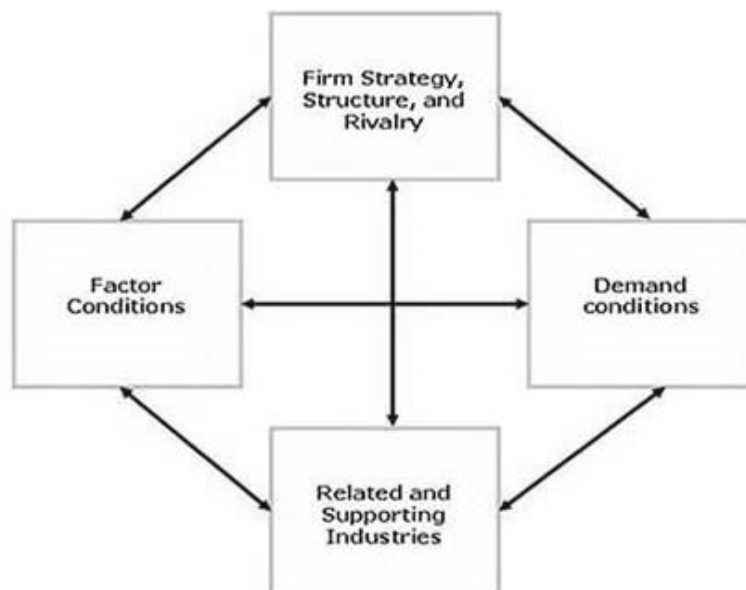


Figure 10 - The diamond (Porter, 1990, p.77)

**Factor conditions:** Access to skilled labour, infrastructure, capital, raw material and other aspects shaping the prerequisites for production and other operations. Supply of assets providing a major difference for the industry through fulfilment of a special need such as scientific institutions or funding opportunities are of high importance for the attractiveness of locations. Trott (2005) points out that premises for infrastructure and practicalities such as provision of electricity, communication and transportation means are crucial factors behind companies' will to invest in facilities in certain countries.

**Demand conditions:** Domestic demand for the products and services offered by the company or its industry. Porter (1990) argues that a strong domestic demand is crucial despite the fact that markets are increasingly globalized. This as a considerable local demand gives incitements for keeping up with innovation and development of new solutions which also benefits from being tried out on a smaller scale at the local market before a wide launch. Presence on markets with demanding market conditions also lower the need for foreign investment in initial stages of research and development (Aharoni, 2010).

**Related and supporting industries:** Presence of external actors and whole industries applicable as supply or support functions, for example in provision of advantageous offers for components and services. The opportunities to engage in corporations and alliances with different actors located in certain geographical districts or business sectors also impacts the attractiveness of different locations (Trott, 2005; Porter, 1990).

**Firm strategy, structure and rivalry:** Legal and institutional conditions, country specific aspects of culture and values as well as the presence of rivals in the industry are all factors influencing the business climate. As for a strong domestic demand, high rivalry on the local market stimulates development of competitive offers with potential use also on the global scale. Geographical concentration of companies and industries also provide incentives for creation of public support mechanisms benefitting the industry. These clusters do also increase public attention in the field and serve as an attraction force for foreign investors (Porter, 1990, 2000)

Political conditions concerning policies, tax advantages, legal conditions and rights supporting the creation and protection of intellectual property are of extra interest for investment in innovative and knowledge intensive operations. Also the economic climate as such with regards to inflation, interest rates and stability does also affect companies' attitudes towards investment in innovation activities (Trott, 2005; Porter, 1990).

Challenges originating from a need for adaptation of existing organisational structures and processes following an establishment on a foreign location are, by Johanson and Vahlne (2009), referred to as liabilities of foreignness. Jansson et al (2007) pictures the establishment of a firm in a new environment as an entrance in an existing network structure consisting of structures and relations shaped by the actors present on the market. This network provides cognitive, normative and regulative conditions which affects the company's acting space and following behaviour. The institutional distance between the home and foreign environment may lead to special treatment from customers, the government or other stakeholders compared to local firms. The reason for discriminative reception can also be protection of the domestic actors (Ramachandran & Pant (2010). Zahoor and Mosakowski (1997) recognise this risk for diverse treatment but also assess that time spent in the country will have a positive impact on learning, adoption and legitimation processes. This adaptation happens, from the company's side but also from the local environment, which can facilitate the adjusting process processes by deregulation and policies concerning the industry.

Johanson and Vahlne (2009) mention that the liability of foreignness and difficulties in understanding and accommodating to the foreign market conditions is facilitated by a gradual expansion starting with markets which are relatively close to the origin. Establishment of activities often starts with cooperation with local intermediaries representing the company's interest on the local market. Later followed by formation of internal operations like sales offices and manufacturing units this stepwise process supports the integration on the new market. The presence of prior established internal functions at a specific location helps recent arrivals to tap into knowledge and information that simplifies the accommodation to predominating conditions (Hilmersson & Jansson, 2012; Johanson and Vahlne, 2009).

The social and cultural conditions in the initial home country also have a considerable influence in the process of internationalisation. The initial organisation of the company with processes, structures and corporate culture influenced by the home country is not necessary conformable with the conditions in a foreign location leading to a need for adoption to new circumstances. These liabilities of origin, including additional costs following organisational adjustments, are seen as disadvantages for an entering foreign firm compared to already present local actors on the market (Ramachandran & Pant, 2010; Tulder, 2010)



Ramachandran and Pant (2010) identify another risk related to establishment of activities in international settings which is prejudices and negative images of different countries and markets referred to as the country of origin effect. Roth and Romeo (1992) explain the country of origin effect as the general image of a country derived from its innovativeness, use of technology and design, prestige and brand reputation, and perceived reliability and quality of workmanship. Even if this image is far from universal for all sectors or companies originating from the country the national background does have an impact on the approach of products and services in terms of quality. Ramachandran and Pant (2010) mention that an unfavourable reputation for products or services produced in a specific country may lead to competitive disadvantages. Effects as symbolic and emotional meanings attached to companies' offers caused by interpretations of the country of origin are also brought up by Verlegh and Steenkamp (1999). One aspect of this effect is the preference to buy domestic products and services due to support local producers (Ramachandran & Pant, (2010). Therefore companies sometimes highlight the country of origin that has the most appealing reputation, even if only a few activities in the value chain are located there (Verlegh and Steenkamp, 1999).

### 2.1.5 Summary of chapter

The increased **globalisation** of international markets has changed the prioritizing and localisation of activities in the value chain. Today, **ICT solutions facilitate coordination across geographical borders** enabling a widespread localisation of a company's functions. A focus on **value creation** throughout the chain leads to investment in locations providing the **highest value to minimal costs** from leverage effects based on **locally available skills and resources**. Increased global impact from new and emerging markets drives an increased **diversification of customer needs**. In combination with demands for **rapid technology development** this gives urgency for acquisition and integration of **competent labour and technology**. Activities located in a foreign country the company are to a high extend affected by **local conditions**, especially when cultural and **institutional conditions** among the home and foreign countries are very diverse. **Internal adjustment** of procedures and structures is required for **conformity with local norms and way of acting**. **Cooperation with local partners** or **prior establishment** of other internal functions in the country can facilitate the accommodation of new activities.

The following factors derived from the chapter above can be seen as having an influence on localisation of companies' R&D activities:

- Globalisation of markets
- ICT facilitated global coordination
- Focus on value creation
- Maximized value to minimal costs
- Local skills and resources
- Diverse customer needs
- Rapid technology development
- Labour competence
- Technology
- Local conditions
- Institutional conditions
- Conformity with local norms and way of acting
- Cooperation with local partners
- Prior establishment

## 2.2 Research and Development

Research has traditionally, despite internationalisation and abroad localisation of other activities in the value chain, been carried out in the country of origin. The reason can be explained as a strive for keeping strategically important R&D activities close to each other (Kuemmerle, 1997). Following the concentration of knowledge and skills at the headquarters, internationally located subsidiaries were mainly targeted for adaptation and commercialisation of predefined products and offers. Recently this has changed towards a focus of R&D activities located at widespread sites worldwide. These locations are recently also given higher priority for innovation activities like the development of new technologies important for both local and global markets (Cantwell & Mudambi, 2005).

Vittorio (1996) describe three types of research and development activities: development of technologies, product development and technical support. Trott (2005) further defines a more detailed division of the research activities and divides R&D in the categories: basic research, applied research, product development and technical service (see figure 11). Basic research, mainly realised within universities, aims to generate discoveries and knowledge in prior unknown areas where the applied research use existing knowledge and technology for providing solutions to specific needs or application areas. In the corporate sector, business strategies and clear commercial targets are driving forces behind research activities and product development rather than contribution to enhanced scientific knowledge. However, research and development activities may still cover the different levels of the R&D continuum.

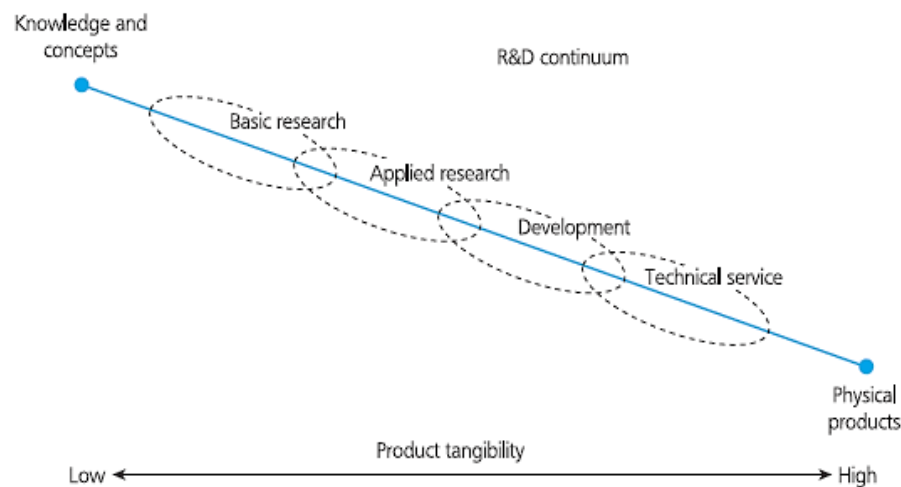


Figure 11 - R&D continuum (Trott, 2010 p.244)

### 2.2.1 International localisation and integration of R&D units

Kuemmerle (1997) and Zedtwitz and Gassam (2002) refer to the reasons behind a rise in internationalisation of R&D activities as the increased geographical spread of skilled, knowledgeable workforce. A more competitive environment for technology and product development also has a major influence. This exposure to competition and contest for acquiring valuable resources initiate a search for locations providing high quality competence and mechanisms enabling product development matching the rapidly changing market demand. Leiponen and Helfat (2011) also refer to widespread location of R&D activities for accessing knowledge and skilled labour but also bring up the rising costs following such a decentralisation.

Douglas and Craig (2010) describe understanding of local market conditions as highly important for successful implementation of R&D strategies developed in close relation to the end customers. Porter's (1979) competitive forces can serve as an example of factors influencing the local market conditions. Apart from threats from new entrants and substituting offers, bargain powers of suppliers and customers and conditions for competition in the industrial context, de Wit and Meyer (2010) adds infrastructure and governmental regulations as elements having an impact on the local circumstances. Cooperation with customers, local facilities, market conditions and costs are factors affecting the output from the R&D activities according to Zedtwitz and Gassam (2002). Johanson and Vahlne (1977) write that market specific knowledge concerning cultural patterns, business conditions and insight in the needs of local customers can only be acquired through presence on the location. Awareness of the diverse local conditions is also of importance for successful internal integration of globally widespread activities (Douglas & Craig, 2010; Johanson and Vahlne, 1977). This is by Hilmersson and Jansson (2011) referred to as internationalization knowledge as the organisation understands and experiences the management of business activities on an international scale. Hedge & Hicks (2008) mention that beneficial conditions for realisation of R&D activities not only is of interest for the specific company but also seen as major competitive advantage for whole nations striving for acquiring domestic and foreign investment in R&D. Favourable policies, public funding opportunities and well educated and skilled workforce are factors of major importance for companies' location of R&D in reach of governmental influence.

### **2.2.2 Organisation and localisation of R&D units**

The main reasons for an earlier focus on concentration of R&D operations are according to Vittorio (1996) reduction of costs, economies of scale and eased communication. The increased globalization of activities within the value chain has had a great impact on the localisation of R&D activities where IT-facilitated communication is another enabler for dispersion of locations (Cantwell and Janne, 1999). Increased competition among alternative placement of R&D units is also driven by an increased supply of differentiated and specialised technology development at different locations (Vittorio, 1996; Cantwell and Janne, 1999). As a consequence, companies can utilize particular competences and resources from widespread locations to complement existing R&D instead of concentrating the activities at one or few centralised sites (Cantwell and Janne, 1999). Douglas and Craig (2010) emphasise the importance of global synergies across the value chain for competitive advantages like economics of scale but also warn for the costs rising from coordination of widespread locations. The central management level plays an important role in strategic decision-making but also for the creation of a mind-set for knowledge and technology sharing in the organisation (Douglas and Craig, 2010; Pearce, 1999). The geographical distribution of R&D units is valuable for the firms' innovation and research capacities but only up to a certain point when costs and organisational limitations for coordination and adaptation takes over (Lahiri, 2010)

According to Zedtwitz and Gassam (2002) development units are often more spread out geographically speaking compared to more centralized research functions. This as local product development units often are created with the purpose of supporting prior established sales and market functions at the location. Belussi and Sedita (2010) write that foreign localisation of R&D operations usually concern a complementary growth and inclusion of external and internal technical expertise rather than a substitution of prior activities. The need and cost for coordination of R&D activities depends on the nature of R&D performed.

Kuemmerle (1997) further describes a framework for possible functions of R&D sites located abroad as:

- **Home-base-augmenting sites** where foreign located R&D units are used for the purpose of acquiring and leveraging knowledge and skills which is transferred to the home country. Also Belussi & Sedita (2010), Vittorio (1996) and Pearce (1999) argue that geographically spread R&D units can stimulate exploitation of unique local resources such as technological capacity and skilled workforce derived from internal knowledge creation or external sources at the location. An organisation providing favourable prerequisites for coordination and exploitation of innovations and product concepts across the organisation is here crucial for the spread and use of results on several markets (Belussi & Sedita, 2010, Lahiri, 2010).

- **Home-base-exploiting sites** where foreign R&D units are located close to foreign manufacturing plants intending to work as a support organ for local product development for the specific market (Kuemmerle, 1997 and Vittorio,1996). Pearce (1999) supports the idea describing foreign R&D work as interplay within the local subsidiaries. Centrally derived knowledge is then integrated with local competence for development and commercialisation of products meeting respective market and production conditions.

Alternatives for organisation of R&D activities can also be summarised in the model Zedtwitz and Gassam (2002) present representing four archetypical forms of internationally spread of R&D units:

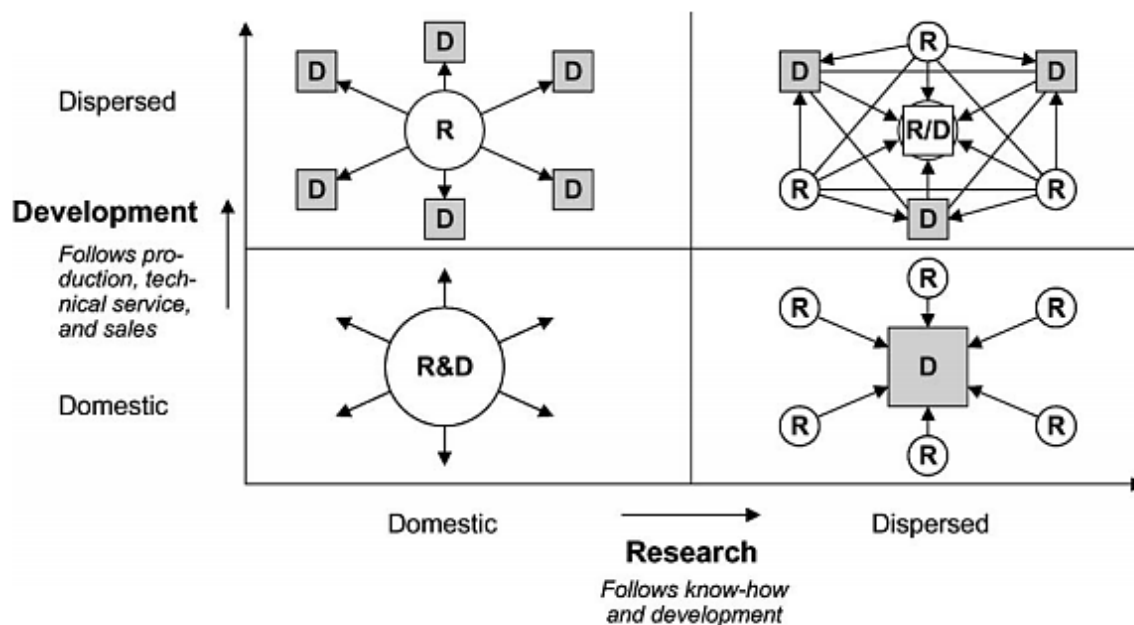


Figure 12- Organisation of R&D units (Zedtwitz and Gassam, 2002, p. 575)

- **National treasure R&D with domestic research and domestic development.** Here most activities related to R&D are concentrated and kept at the home location for eased control of the intellectual capital and technology developed. Internationally located units may also exist and are if so controlled and monitored from the home base. This organisation normally requires a strong technical position or a major focus on the domestic market and the products developed should be rather standardized without a big need for local adaptation (Zedtwitz and Gassam, 2002) correlating with the explanation Vittorio (1996) gives for R&D activities organised in central global laboratories. Here technical resources concentrated in the country of origin (or location of headquarters) bring about prototype products which later are adapted to different market needs by corrective mechanisms at respective local R&D facility.

- ***Technology-driven R&D with research spread out on different locations whereas development functions are kept at a domestic level.*** This situation is mostly present in high-tech companies where the research requires access to skilled personnel and centres of scientific excellence. Reasons for keeping development activities on the domestic location can be proximity to central control and decision organs, synergy effects, lower costs for coordination and economics of scale with other functions (Zedtwitz and Gassam, 2002)

- ***Market-driven R&D where research units are kept at the domestic location when product development is more widespread at international sites.*** This organisation often, according to Zedtwitz and Gassam (2002) originate from a market-driven business model rather than a focus on scientific development. The lower importance given to research activities is also a reason for keeping these activities at the home basis for attaining economies of scale and control.

- ***Global R&D with research as well as development units located abroad on widespread locations.*** Supported by global coordination, research units located close to centres of excellence provide beneficial conditions for high quality scientific and technology development. These subsidiaries with operations closely connected local technical competence and specialisation can also be described as specialized global laboratories (Vittorio, 1996; Zedtwitz and Gassam, 2002).

### **2.2.3 Trends in internationalisation of R&D**

The last decade's trends in internationalisation of R&D can, according to authors such as Zedtwitz and Gassam, (2002), Vittorio (1996), Cantwell and Janne (1999) and Douglas and Craig (2010), be described as follows in figure 13:

1. Internationalization of research driven by difficulties accessing resources such as skilled labour and beneficial conditions for technology development in the home country. This leads to placement of research centres at locations with high focus on science and innovation including supply of labour with high technical competence.
2. Outplacement of development units originating from the need for customer interaction in the R&D activities following a need for local adjustments of the products in later stages of the development process due to diverging market needs.
3. Establishment of product development units for direct usage of the research outcomes in foreign subsidiaries. These facilities aim at refining and commercialising the resulting outcomes from the technological research at the surrounding local markets.
4. Local on-site research units which competence and expertise provides opportunities for retrieving responsibility for particular technologies which can be used locally as well as on a global scale in the company.



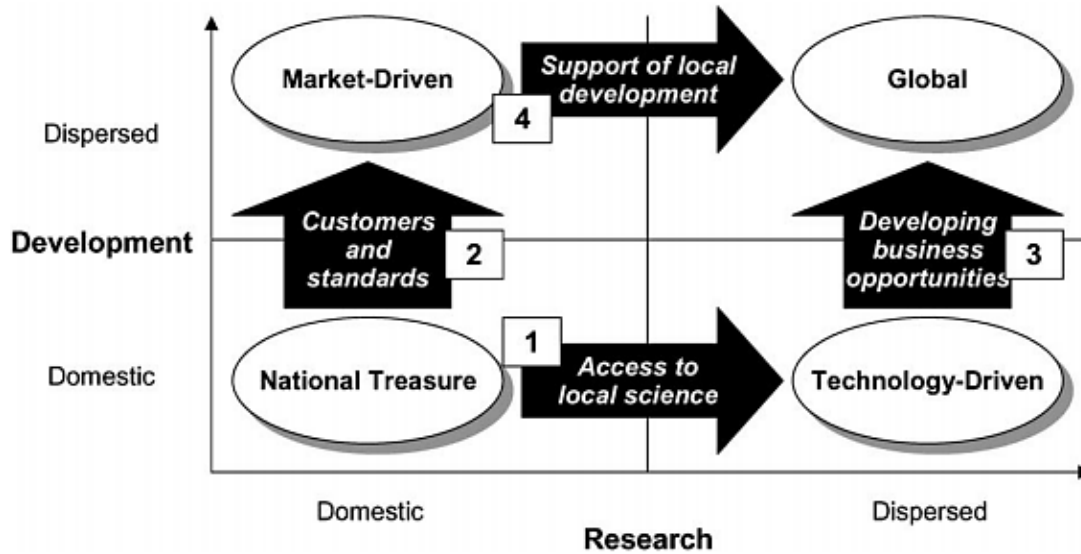


Figure 13 - Trends in organisation of R&D (Zedtwitz and Gassam, 2002, p. 581)

#### 2.2.4 External collaboration in R&D activities

Within R&D activities it is crucial for companies to interact with external actors to minimize costs and risks as well as for acquiring access to skills and resources (Arauzo-Carod and Segarra-Blasco, 2008; Li and Xie, 2011). Belderbos et al (2004) present three different alternatives for corporations in R&D activities: Horizontal cooperation with competitors, vertical cooperation with suppliers or customers and institutional cooperation with universities and research institutions. Cooperation with customers and suppliers aims at reducing costs, developing products better targeted to demands or enhanced integration along the value chain. The collaboration with universities and institutions does mainly aim at attaining knowledge and skills for direct use in the R&D processes. More than attaining specialist knowledge and technological resources, the collaborations with universities can potentially also provide public funding for the research undertaken as university collaboration often concerns development of basic concepts rather than products close to commercialisation. The risk related to sharing of intellectual property is lower than in integration with suppliers or customers according to Belderbos et al (2004). Cohen et al (2002) however argues that the universities' impact on industrial research has shifted from a primary involvement in basic research towards a wider scope ranging from idea generation to commercialisation of products, partly due to joint ventures and collaborations with the industry.

Abramovsky et al (2007) and Lahiri (2010) refer to a spill-over knowledge effect derived from realisation of research activities in companies and universities. This spill-over knowledge, especially rising from integration in partnership programs and collaboration activities is likely to be more concentrated at areas with high quality research including University-performed R&D. If the foreign location can provide a well-functioning IPR protection, knowledge intensive activities can more easily be spread to external actors. In the opposite case it is however preferable to keep R&D activities in-house in wholly-owned laboratories to minimize the risk to leak information. Another risk from close interaction with local actors is a potential rise of inter-organisational barriers among internal R&D units following a higher focus on external input and collaboration on behalf of internal knowledge sharing and capacity building (Lahiri, 2010).

### 2.2.5 Summary of chapter:

International localisation of research and development activities has increased as an important mean for access to **local centres of excellence** gathering cutting edge knowledge, **technological resources** and **skilled labour**. These resources enable innovative activities and development of new and existing products and solutions for use on **local** and **global** level in the organisation. Widespread R&D functions also enables **local specialisation** in diverse technological areas with outcomes can be used as a piece in the puzzle forming the company's overall R&D strategy.

**Closeness to customers** on influential markets and **integration among functions** across the value chain aiming at **synergy effects** or eased **commercialisation of research results** are other aspects for R&D localisation. Globally spread R&D functions create a high demand of internal coordination for **transfer** and use of **competence and technology** within the organisation. **Local external collaboration** activities having an impact on the **flow of intellectual property** and ideas across internal and external borders should also be considered. **Protection of IP rights** is to be weighed up to essential **input from external collaborations**.

The following factors derived from the chapter above can be seen as having an influence on localisation of companies' R&D activities:

- Local centres of excellence
- Technology
- Skilled labour
- R&D for local use
- R&D for global use
- Local technology specialisation
- Closeness to customers
- Integration along the internal value chain
- Synergy effects
- Commercialisation of research results
- Internal coordination
- Transfer of competence and technology
- Local external collaboration
- Flow of intellectual property
- IPR protection
- External input

## 2.3 Offshoring or offshore establishments

Globalization, together with accelerated technological advancements and the entrance of new international players from emerging markets have increased competition and thus created a more turbulent competitive environment for businesses. To compete in this international environment offshoring, expansion or outsourcing of manufacturing activities to low cost regions has long been practised, but the offshoring or the movement of business functions to other shores, of more high value “white collar” activities is a fairly recent activity. Dossani and Kenney (2007) mention in their article that in less than six years, offshoring of services has evolved from an exotic and risky strategy to a routine business decision and Apte et al (2006) conclude that product development is the fastest growing offshoring segment in India. As the amount of R&D in offshoring increases, Lewin et al (2009) suggest that the current shift in strategies should be towards the global sourcing and utilization of science and engineering (S&E) talent. Where in the past most companies would build up and concentrate most of their product development functions back home and employing domestic S&E talent, they have recently begun to hire and use this workforce at globally disperse locations.

Relevant literature offers slightly diverse definitions of the term offshoring, Traditionally offshoring is seen as a relocation rather than an expansion of labour (Thondavadi & Albert, 2004; Blinder, 2007 etc.) but latter articles, like Lewin et al (2009) and Martinez-Noya et al (2012) seem to widen the term slightly to also include offshore expansion in the discussions and the term offshoring is thus used more to indicate the location rather than relocation. Temouri et al (2010) even suggest that offshoring of advanced or high value functions rather is an employment growth than a cut off. Although Blinder (2007) clearly states that offshoring is about relocating jobs, he also defines another type of offshoring that could as well be classified as foreign direct investment, FDI; companies establish jobs that serve the local market, but locate them in another market. An example can here be a Swedish company which starts a manufacturing process in China with the intent of exporting back to Sweden. This tends to be described as offshoring, even if the company never existed in Sweden. For the sake of the thesis it is of interest to figure out where the companies expand offshore and where they reallocate the workforce but for the sake of definition the terms are kept separate (even if they share many characteristics)

Generally there are four different sourcing strategies that can be applied to every business function whether it's product development (Eppinger & Chitkara, 2006) or R&D (Martinez-Noya et al, 2012). The choices of “location” (i.e. inshoring or offshoring) and organization (i.e. in-house or outsource) are described both for establishment of foreign establishment of R&D (Kuemmerle, 1999) and for offshoring of R&D (Martinez-Noya et al, 2012).

The related strategies described by Eppinger and Chitkara (2006), see figure 14:

1. Performing it in-house in its home country (Centralized)
2. Outsourcing it to a provider in its home country (Local outsourcing)
3. Performing the function in-house but under an affiliated foreign subsidiary (Captive offshoring)
4. Outsourcing the function to a unaffiliated provider located in a foreign country (Offshore outsourcing).

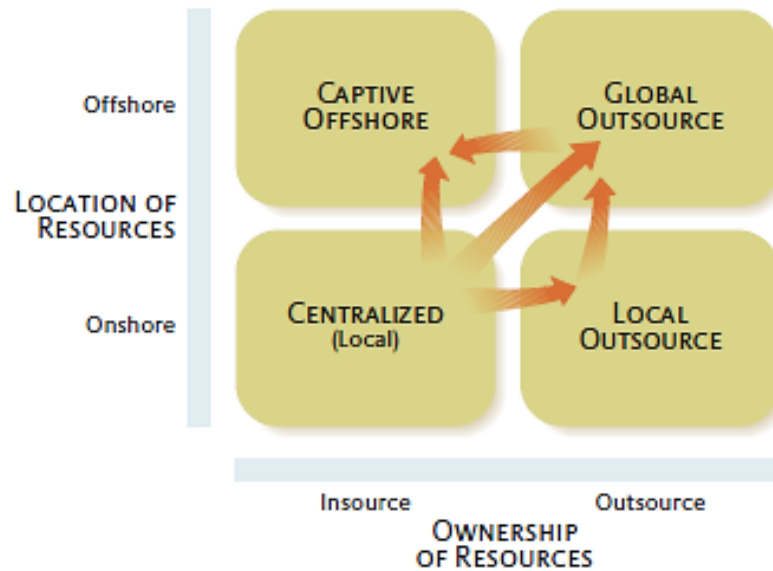


Figure 14 - Strategies for outsourcing and offshoring (Eppinger and Chitkara, 2006, p.27)

To adhere to the purpose of the thesis we will look at the strategies on the offshoring side of the scale, including captive offshoring but excluding global outsourcing due to the thesis' limitations. Offshoring, as a dimension in this chart, is rather used as the “foreign” alternative to location rather than describing a relocation of workforce. The usage of *captive offshoring* as a strategy to expand to another country could either be done by offshoring in the traditional sense by relocating jobs or an expansion/establishment of parts of the company to another country. That makes it a versatile term to use in the thesis for unspecified offshore expansion.

### 2.3.1 Definitions

A simple pointer about the term offshoring from Blinder (2007) is that offshoring is about the localisation of the work done and Thondavadi and Albert (2004) write that offshoring is nothing but cross-border reallocation of labour. Lewin et al (2009) takes it further by defining offshoring as the process of sourcing and coordinating tasks and business functions across national borders and also makes a distinction between in-house (captive, or international in-sourcing) activities and outsourced offshored activities performed by an external provider. Thondavadi and Albert (2004) gives the same explanation but also suggests that offshore in-sourcing (in-house) is often used for bigger processes where the companies want to retain control and offshore outsourcing is used for smaller functions. According to Lewin et al (2009) offshoring is referred to as a pure sourcing phenomena that does not refer to for example sales activities on a global or domestic rather than a local level. The definition of offshoring we will use in the thesis will be from Lewin et al (2009, p3):

*“Offshoring refers to the process of sourcing and coordinating tasks and business functions across national borders. Offshoring may include both in-house (captive, or international in-sourcing) and, increasingly, outsourced activities that are performed by an external provider - that is, from outside the boundaries of the firm.”*

Offshore establishments is in the thesis used as the counterpart of offshoring, except that it is not about relocating jobs or business functions across national borders but the new establishment of complementing jobs or business functions in another country (Kuemmerle, 1999). FDI or foreign direct investment of R&D is considered to be included in the term offshore establishments.

The term offshoring is often confused with outsourcing, which is different. To clarify: outsourcing refers to an organization contracting work out to a third part outside of the company, while offshoring refers to getting work done in a different country (Blinder, 2007). It is hence possible to outsource work but meanwhile not offshore it. An example could be the hiring of services from an external law company in the same city instead of maintaining an in-house staff of lawyers. It is also possible to offshore work but not outsource it, where an easy example is the use of customer service centres in India to serve Swedish customers. Last, offshore outsourcing is the practice of hiring an external part to perform the work in another country; here both terms can be used at the same time. There will hereafter be less focus on outsourcing in this paper due to the limitations related to the purpose of the thesis.

### 2.3.2 Factors behind offshoring decisions

The main reason for offshoring has traditionally been to reduce the cost of performing a task, but Srivatsan et al (2008) write that the main focus of offshoring is drastically changing from a cost based perspective towards a higher emphasis on long-term quality and flexibility. Lewin and Peeters (2006) also write about a shift from more simple and specific activities to more complex and value-adding ones. For a growing number of companies, reducing labour cost as a main reason for offshoring is therefore replaced with access to pools of talent around the world (Lewin et al, 2009). The rise of emerging, fast growing markets like China, India and Brazil is providing the world market with an abundance of skilled personnel. Rapid development in Information and Communication Technologies (ICT) has also influenced companies' sourcing strategies (Blinder 2007). A summary of reasons to offshore found in the literature:

Reducing cost	Lewin & Peeters, 2006; Doz et al, 2006; Thondavadi & Albert, 2004; Quelin & Duchamel, 2003
Access or speed to market	Thondavadi & Albert, 2004; Lewin et al, 2009
Access to qualified labour	Lewin & Peeters, 2006; Lewin et al, 2009; Doz et al, 2006; Thondavadi & Albert, 2004; Manning et al, 2008
Gaining flexibility or quality	Srivatsan et al, 2008; Thondavadi & Albert, 2004; Farrell, 2006; Quelin & Duhamel, 2003
Competitive pressure	Lewin & Peeters, 2006; Cohen et al, 2002
Accelerating growth	Lewin et al, 2009
Gaining local knowledge	Martinez-Noya et al, 2012
Will to become a global player (MI)	Lewin et al, 2009

According to Lewin et al (2009) and Manning et al (2008) access to qualified labour is the most important factor in the decision of offshoring advanced functions and tasks. It is driven from the decreasing supply of science and engineering graduates in the western world whereas developing countries like China and India's supply is increasing in this field. Cost reduction is also a heavy factor in the decision and Manning et al (2008) writes that the balance between a qualified workforce and cost is what most companies take into consideration. Many authors claim that the cost of labour arbitrage is the main reason for offshoring all kind of activities (Dossani & Kenney, 2004; Quelin & Duchamel, 2003). Others, like Lewin & Peeters (2006) and Lewin et al (2009) have the opinion that the cost of personnel is only an important factor for less complicated tasks like call centres. This factor is a clear indicator that the reasons for offshoring are changing rapidly; cost seems to have been the main factor in the decision in the earlier years of the trend but lessens as the offshoring phenomenon and the companies performing it mature.

Much of the literature state that the two reasons mentioned above, cost and access to labour, are the main ones for offshoring. There are other factors that should also be equally considered. To gain access to markets through subsidiaries is necessary in countries with large bureaucracy and legal obstacles (Thondavadi & Albert, 2004) and it also speeds up the delivery process, both because of geographical position and circumvention of bureaucracy. Flexibility is mostly gained in the possibility of scaling the workforce and because the staff can "work around the clock" due to time differences in the world (Lewin et al, 2009) and also because the added flexibility in the labour size (i.e. easier to lay off workforce) compared to more developed countries (Farrell, 2006). This also gives possibilities to accelerate the growth of the firm, a factor which seems to be closely tied to the access of qualified labour. Gaining quality through offshoring is also a factor, where general quality standards are rising rapidly in developing countries (Srivatsan et al, 2008). An important factor when expanding a company into other regions is to gain knowledge of local conditions and requirements to be able to match the range of products and services to local conditions (Lewin et al, 2009).

Managerial Intentionality (MI) is a factor described by Lewin et al (2009). It is a bundling of firm specific objectives that companies' managers have in mind that they translate into decisions and strategies. One clear objective they found was a will amongst managers in larger companies to become players in the global arena, which often was translated into decisions of expansion in other countries through offshoring and outsourcing.

When talking about offshoring R&D, Doz et al (2006) mentions several reasons that are similar to those found for general offshoring; rising cost in the west, rapidly growing new markets, advancement in ICT technologies and also a general scarcity of engineers and scientists. According to the article there are only two valid reasons to add a new R&D node: To cost-effectively access critical knowledge that could not otherwise be tapped and to locate capabilities where they can deliver results better, faster and cheaper than anywhere else in the network. Lewin et al (2009) argue that access to qualified labour at a lower cost does influence companies' decisions to offshore R&D activities but compared to less advanced and back office activities labour arbitrage is less important in the decision of outsourcing R&D. They also argue that another factor in the decision of offshoring higher value functions are the company's on-going and past experiences of offshoring while Martinez-Noya et al (2012) is of the opinion that firms with strong technological capabilities are likely to have an edge.

The reasons to establish a new R&D unit are very similar to those for offshoring said function, but with slightly different priorities. Belderbos et al (2008) gives empirical evidence that investment in foreign R&D is driven mainly by the need to exploit and adapt the technology, products and services to the local conditions, which is also concluded by Kummerle (1999) and Temouri et al (2010). There is also the need to access foreign technological resources and capabilities like labour or industrial infrastructure (Kummerle, 1999). Cost is still a large factor, but is usually mentioned as cost efficiency, where a dollar spent in for example India generates more value than a dollar spent in Belgium (Belderbos et al, 2008). A

more general reason for FDI in R&D is generally to augment the company's knowledge base by adding knowledge from other countries (Kuemmerle, 1999) and that specifically happens when local demand in new markets grow increasingly complicated (Temouri et al, 2010). For high tech firms specific knowledge gains or ownership advantages, i.e. managing core technologies across national borders with limited technology leakage or spill over, might be an important reason for FDI in R&D (Temouri et al, 1999).

As stated in the chapter introduction, the general course of offshoring in companies usually starts with simple and specific tasks (Lewin & Peeters, 2006) and then evolves into offshoring of more complex activities, like R&D. The offshoring of both research (Lewin & Peeters, 2006) and product development (Lewin et al, 2009) is expected to increase in the future.

### **2.3.3 Factors influencing location**

Location selection for an offshore operation is a big decision and not an easy task for the company leadership. For offshored R&D, Doz et al (2006) writes that it's critical that the leaders can justify for example the high cost of operational efficiency in an emerging market or the high cost of knowledge access in a developed one. It is also crucial to know what you want before choosing where to source to. In a survey Doz et al (2006) found that, for companies offshoring R&D activities to China, 47% of the survey companies said their top motive for local R&D was gaining access to the local market. 36% said that their main motive was tapping the local workforce quality or lower cost base, a number that is expected to have become even lower in recent years. For India the results differ; 55% of the companies say their main interest is the nation's low cost talent pool.

When new R&D sites were planned in high cost nations like Europe, the US or Japan it was because of their proximity to technology or research clusters, proximity to market or when the qualified workers commensurate with the higher cost. Locations in the developing world were chosen primarily to gain access to local markets and to lower costs and to get access to the local workforce (Doz et al, 2006). Those are reasons corresponding well to all the previous mentioned ones from other literature. The same survey also shows the emergence of China and India as the present winners of the competition for established and offshored R&D sites, where 77% of new R&D sites planned for 2007 were either slated for India or China. By the end of 2007 it was also projected that China and India's share of global R&D staff would increase from 19% to a total of 31%, also replacing Europe as the most important location for US foreign R&D investment.

Studies show that companies generally are more concerned about intangible aspects like knowledge and value creation than more tangible aspects like cost when thinking about offshoring R&D. Multinational corporations also strive to locate their R&D in dynamic and forward-driving markets to learn and adapt to the conditions (Gerybadze, 1999). This argument sits well with the observations made by Doz et al (2006) in the paragraph above and also with Kuemmerle's reasoning (1999) about FDI in R&D. Farrel (2006) is of the opinion that it might be smarter to locate offshoring operations beyond the hot-spots because of rising wages, burdened infrastructure and a higher demand of educated personnel that is outstripping the local supply. Others like Feinberg & Gupta (2004) and Belderbos et al (2008) are of the opinion that the hot spots are advantageous for R&D because of the potential for knowledge spill overs from existing R&D networks (i.e. other companies, universities and other academic facilities) and is highly relevant for the choice of an offshore location. Much of the FDI also seems to be influenced by peer pressure since foreign projects almost exclusively end up where other foreign investments are made (Mukim & Nunnenkamp, 2012). Aaron and Singh (2005) write that there is a fear among companies to accidentally transfer knowledge and even core competences (spill over knowledge) to their competitors in new markets and that it can affect the willingness to offshore certain advanced processes like R&D. Belderbos et al (2008) is of the same opinion but mentions that a positive climate for protection of intellectual property rights (IPR) in the country could increase the willingness for FDI. Other external factors that make locations attractive for direct investment in R&D are the supporting industries, like suppliers of important



equipment like laboratory equipment (Dunning, 2000). Because of the rapid increase and ease of transporting goods since the article was written the importance of said factor might be up for discussion.

Farrel (2006) has compiled a list of factors where the company should collect regional information before making the decision about the offshoring location:

- **Cost:** Labour, taxes, infrastructure and real estate
- **Skill availability:** Skill pool, vendor landscape and size of the offshoring sector
- **Environment:** Business and governmental environment and accessibility
- **Market potential:** Both local and nearby markets
- **Risk profile:** Disruptive events, political stability, general security, IP- and macroeconomic risks
- **Infrastructure quality**

Traditionally multinational entities (MNEs) have expanded through a sequence of countries, starting with those that are geographically close to the company's country of origin (Rugman & Verbeke, 2004). The rapid advances in ICT have greatly affected the possibilities for companies to expand by allowing convenient communication between the parent company, the subsidiaries and everyone in between. According to Lewin et al (2009) this has led to a change in the companies' behaviour, where they increasingly chose offshoring locations independent of geographical distance. The authors also claim that the R&D offshoring strategies for large MNEs might be evolving from a "Home Base Augmenting" (HBA) level, where the companies reinforce activities performed at the headquarters, to a "Home Base Replacement" (HBR) of innovation activities, i.e. creating R&D centres that has less ties to the headquarter. A strategy commonly used for the global distribution of work is to optimize the company's value chain by dividing it into as small pieces as is organizationally feasible and follow that up by deciding where each slice of the value chain will be allocated geographically (offshoring) and organizationally (outsourcing) (Contractor et al, 2010)

#### 2.3.4 The future of Offshoring in an Indian perspective

Blinder (2007) poses in his article the question how long the offshoring phenomena, where western companies move workforce to lower cost countries, will continue. His assumption is that it will continue and increase for a long time because of:

- the rate of technological change in ICT will make it possible to offshore more complex jobs
- the emergence of countries like China and India that will continue to provide increasing numbers of skilled labour at a low cost.

There are also a higher volume of product development activities going to offshore locations (Lewin, Massini et al., 2006) and according to Lewin and Peeters (2006) offshored research is also predicted to increase a great deal, together with an increase in globalized research. Temouri et al (2010) predicts a decline to the scale of all FDI in the near future, including offshoring and establishment of R&D: more and more of the world's total FDI has been financed by debt. Since the economic crisis it has been harder to finance debt and as a result FDI has declined during the crisis. While FDI associated with establishment is less likely to happen during a financial recession, a cost based offshoring decision might be more likely. Temouri et al (2010) also predict that growth in offshore establishments and offshoring might not be as strong as has up to now been anticipated. This because of great transaction costs for high tech foreign operations, a poor global track record of companies' outsourcing/offshoring operations and the global effects of the financial crisis. Lewin and Peeters (2006) also speculate about the effect of rising wages in developing countries, but according to the theories about offshoring and establishment of R&D or other high technical functions cost does not matter as much.

India is one of the countries that is massively benefiting from western countries' offshoring. According to Dossani and Kenney (2007) the most sophisticated tasks done in India are at the same level as the tasks done in the developed nations. That is, according to the authors, a sign that India has built up capabilities and an environment that is likely to be very beneficial when (or if) the locational shift of service work happens. Another trend that benefits Indian R&D subsidiaries is that MNEs are distributing global responsibility for whole processes to local subsidiaries to create corporate global centres of excellence. This is benefitting India greatly and many centres are located in the country. An example is Broadcom's global centre for semiconductor design in Bangalore, with global responsibility over other departments in the same area in other countries. Sharma (2012) suggest that in-house development is more effective than outsourced for foreign high-tech companies present in India, and mentions better control over the results as the main reason. Dossani and Kenney (2007) state that foreign MNEs increasingly start purchasing Indian firms of different technological magnitude. According to the authors this shows that the MNEs are confident of the Indian firms' management and the increasing maturity of the Indian subsidiaries.

Madsen et al (2010) prove in their paper that the Indian economic growth during the past five decades has been driven by mainly R&D intensity, and in later years spill-over knowledge from MNEs located in India. Sasidharan et al (2011) consider technological advancement as one of the vital factors of economic growth, and view investment in R&D as investment in technological advancement and hence also economic growth. Many authors (Lewin & Peeters, 2006; Sharma, 2012) including Madsen et al (2010) predict that foreign R&D will increase in India, and that in turn will likely boost the Indian economy. Another factor that according to the authors has had an impact for growth is governmental policy reforms, since they too affect the willingness of FDI in the country. Patent and IPR right improvement have had the largest impact on the increase of growth. There have been periods of rapid reforms in government economic policy since 1991, improving for example the IPR climate and making it easier to import goods, followed by periods of less reforms. Since 2005 the economic climate is quite advantageous for foreign companies. Reforms regarding foreign investments are usually met by resistance from regional and populist parties, which make it harder for reforms to happen (Madsen et al, 2010). A recent example is the 2012 reform of allowing foreign retail firms to act in the country, sparking protest and strikes over the country.

### 2.3.5 Summary of chapter

Summarizing the important findings in the chapter will yield quite a few factors. Traditionally **cost** has been a big reason, both for moving out of a country and moving into one, even if the importance of cost, especially for labour, is lower when offshoring or establishing R&D. Recently access to **labour** has sailed up as an important reason to establish R&D offshore because of a decreasing supply of skilled workers back home and an increasing supply in emerging nations together with a substantial increase in **skills** and **quality** while also being more **flexible**. Another strategic reason for offshore R&D is the need for **local market knowledge** that will be used to **adapt products to the local conditions**. Actually being present in the market will give both **access** and **speed** to the market.

An underlying reason for the whole offshoring phenomena is **competitive pressure**, where the rapid changing market almost demands offshored activities. The competitive pressure can manifest in a kind of **peer pressure** where companies mimic other companies' offshoring activities not to be "left out" and in the intent of managers to expand to other countries just because. Companies tend to stick together with other companies in the same business in clusters or **hot-spots** where an example is the IT industry in Bangalore. Companies are generally afraid of exuding **spill-over knowledge** to competitors, something that happens easier in hot spots because of the closeness of the companies. Important for company localization are **supportive industries**, **infrastructure**, **political** and **macroeconomic risk** and the general **business climate**.

Stagnant home markets spark a huge interest and **attractiveness of the dynamic and fast-moving markets** like India in the world, but **financing the operations** with loans during and after the recession is much harder. Transaction costs for maintaining the operation is an important factor, but has in some parts been reduced by the rapid **ICT technology development**.

The following factors derived from the chapter above can be seen as having an influence on localisation of companies' R&D activities:

- Cost - both on a domestic and a home country level
- Shortage of labour in the first world
- Access to skilled labour
- Gaining flexibility
- Improving quality
- Access to market
- Speed to market
- Need to adapt products for the local market to be able to compete
- Need to gain local market knowledge
- Cost benefits
- Competitive pressure
- Peer pressure
- Hot spots or clusters of companies
- Attractiveness of the dynamic and fast moving markets compared to stagnant western markets
- Presence of supportive industries
- Good infrastructure
- Level political and macroeconomic risks
- Technological development (ICT)
- Funding operations in a recession
- Fear of spill-over knowledge

# 3

## Model for Analysis

*This chapter presents the most important concepts derived from the frame of reference and attempts to tie them together into a model of analysis. The model will be used for the construction of specific research questions which will serve as a further base for the empirical study and analysis of gathered data.*

### 3.1 Model for analysis

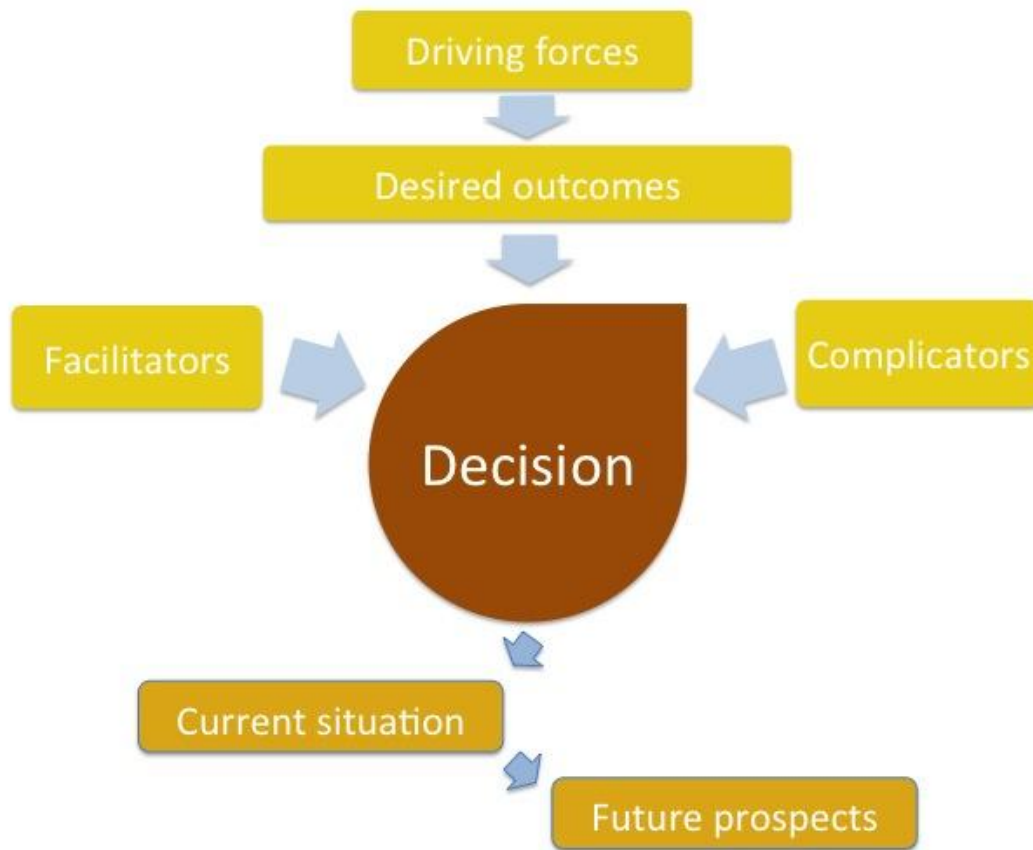
As our thesis aims at investigating the reasons behind and resulting effects of a decision to conduct research and development activities in India, the frame of reference and following analysis focus on factors and outcomes with relation to this decision. After each chapter in the frame of reference, all factors with any relevance for the purpose of the study were hence described and collected in short summaries.

The first part of the purpose for this thesis aims to review the factors behind Swedish companies' decision to conduct R&D activities in India. Factors leading up to the decision can be explained from three different perspectives to capture all dimensions of influence. The two main components, named *Driving forces* and *Desired outcomes* try to explain the phenomena from two different angles: a wider perspective with focus on international trends and underlying drivers for an international expansion and a more narrow perspective focusing on the individual company's reasons and goals with an expansion. These two components are in some ways interlinked since a company's objective of international expansion of R&D might be to negate the effect of one of the larger underlying phenomena. The third component is named *Facilitators / Complicators* and deals with factors that either facilitate or complicate an international expansion. These are often regional or country specific and can usually be seen as indicators of the business climate in the country. Reviewing all the factors gathered from the frame of reference most of them fall naturally into one of these mentioned categories.

The case companies present in the thesis have already made the decision to establish R&D activities in India. Hence the actual process of taking this decision will not be part of the analysis in this thesis.

To address the second part of the purpose, the examination of which role the R&D conducted in India plays in the Swedish companies' global R&D strategies, the *Current situation* and *Future prospects* of the R&D activities in India will be investigated. This aims to show how the R&D operations located in India relate to global R&D strategies and how the outcomes from the Indian R&D activities are utilised. The current situation will serve as a starting point from which analyses and conclusions can be drawn regarding outlooks for future investments in R&D operations in India and globally. As the study is focusing on Swedish companies, the global perspective will also be originating from a Swedish point of view.

Combining these two steps into a graphical model, and also splitting the *Facilitators / Complicators* factor in two for clarification yields this model of analysis:



**Figure 15 - Model of analysis**

To better explain the different parts of the model, a reduction of factors was made by merging similar ones from different chapters to more focused lists of factors belonging to each part of the model. Some factors, like the cost aspect, stretch over many topics. High costs in the home country is a driving force for offshore establishment and meanwhile, a desired outcome for foreign establishment is to lower cost by choosing a country with a lower cost base like India. To further facilitate the understanding of the model each main component and underlying factors are here described in a more thorough way:

***Driving forces***

This component is used to explain the factors leading up to the decision of an offshore establishment. Many of the factors included are phenomenon with essential influence on the development of the world economy today, like increased globalization and technological advances enabling wider use of global value chains. New, progressive and fast growing markets, vastly different from the more mature home markets of western companies are also opening up. The influence from these is especially noticeable these days with economic instability and threat of economic recession. The large populations of emerging markets are also of interest, especially due to a large base of well-educated workforce available at a competitive price compared to the home conditions. The driving forces component is further split into three main elements:

*Globalization* is a collection of factors that deal with international dispersion:

- Globalisation of markets
- Home market conditions
- Diverse customer needs in different markets
- Rapid technological development
- Accelerating growth by getting into new attractive, fast growing markets

*Competitiveness* collects the factors that determine the company's ability to stay on the front edge on a highly competitive global market:

- Labour competence in home market
- Cost to perform R&D in home market
- Focus on value creation
- Integration along the internal value chain
- Need to adopt products for different markets
- Competitive pressure
- Peer pressure

*Resources* deal with the subject of the dispersion and access to resources like labour and competence

- Local centres of excellence
- Local technology specialisation
- Local possibilities for external cooperation
- Hot spots or clusters of competence
- Labour or competence situation on the home market

### ***Desired outcomes***

Desired outcomes are company specific factors behind the decision of establishing R&D in India; what benefits does the company hope to achieve by this?! These achievements are divided into organisational and market based outcomes. The organizational aspect covers the company's expected gain from an internal perspective (organisation of activities, access to resources etc.), and the market based outcomes refers to the expected gain in relation to the market.

*Organizational outcomes* are benefits gained by the company on an organisational level:

- Cost benefits
- Access to local skills and resources
- Access to skilled labour
- Maximising value
- Improving quality
- Performing R&D for local use
- Performing R&D for global use
- Gaining organizational flexibility

*Market based outcomes* are benefits in a market perspective:

- Knowledge about local market conditions
- Access to market
- Speed to market
- Synergy effects
- Local external collaborations

### ***Facilitators and Complicators***

These factors either help and facilitate or hinder and complicate a company's establishment of an investment in of R&D on offshore locations. These factors can be seen from a general perspective comprising the country/region, industry or a more company specific perspective. The theory indicates that these factors do have an influence on the decision of location even if it might not be the most evident



reason. The factors are conditions originating from the surrounding environment and in most cases the company itself cannot directly influence them.

*Macro conditions* are conditions present on a larger, countrywide scale

- Infrastructure
- IPR protection
- Level of political and macroeconomic risk
- Cultural difference
- Foreign market condition
- Home country market condition
- Discrimination due to foreignness (positive or negative)
- Country image
- Funding operations in the on-going recession

*Industry specific* conditions reduce the scale to conditions specific for industries

- Local centres of excellence
- Local hot spots or clusters of companies
- Local technology specialisation
- Presence of supportive industries
- Spill-over knowledge and competence/technology transfer
- External input and collaboration

*The organizational* conditions are conditions for the specific company

- Global coordination (ICT facilitated)
- Flow of intellectual property
- Fear of undesirable spill-over knowledge
- Organizational structure
- Corporate culture
- Internal adjustment to local conditions
- Institutional conditions
- Prior establishment
- Synergy effects
- Adaptation costs

### ***Current situation for R&D in India***

In order to be able to analyse the effects from the decision to locate R&D activities in India this step aims to investigate which kind of R&D activities the companies currently have in the country. These activities will also be seen from a wider perspective in order to explore their relation to the companies' global R&D strategies. This is to be studied based on the connection to market demands and supply of products to the customers but also considering the internal organisation of R&D functions on the global scale.

### ***Future prospects***

Based on the current situation, this part of the model aims to capture the companies' outlook on future investment and localisation of R&D, in India as well as globally. As this study will be part of a larger framework investigating the nature of global value chains, the analysis will also aim to take a wider perspective on the resulting effects of R&D localisation in India and the companies' future prospects for this field. The chapter of analysis will also have a crucial role in providing insights and perspectives for further use in the concluding discussion part of the thesis. This discussion will both facilitate understanding of the thesis topic and point out areas that deserve further research to the employing agency.

## 3.2 Specific research questions

Evolved from the frame of reference and following model of analysis, a decomposition of the purpose of this study has resulted in the research questions presented below. These are meant to serve as a point of departure for the realisation of the empirical study and the subsequent analysis.

- *Which factors influence the case companies' decision of establishing R&D activities in India?*
- *What facilitates and complicates the realisation of such a decision?*
- *What are the case companies' current situation and future prospects for investment in R&D activities in India and how does it relate to their global R&D strategies?*

## 3.3 Delimitations

Commissioning body for this thesis is Growth Analysis, and the delimitations have therefore been adjusted to fit their interests. In accordance with the assignment from the Swedish Government to analyse and provide increased understanding of global value chains, their underlying driving forces as well as their impact and consequences for Sweden's competitiveness and future growth policy, the thesis has had its starting point in Swedish companies' R&D activities in India and the following effects related to the perspective of global value chains.

This study is focusing on two Swedish companies that have already established R&D activities in India. It would also have been interesting to examine companies in the process of starting up R&D activities in India, however due to time restraints this was not possible. The focus on Swedish companies allows direct comparison with the business-environment drivers that affect the companies' operations in Sweden. Further the study is delimited to intra-company R&D in India, leaving outsourcing and innovation theories largely out of the picture as well as national economic theories.

In order for the case studies to attain depth in the analysis, the number of case companies was limited to two, in line with the commissioning body's council. The selected companies were easily accessible from New Delhi, which enabled realisation of the interviews within a limited budget and time frame. At the companies the respondents were exclusively managers at different levels in the organisations. The study could have been broadened by, for example, including the companies' customers or partners to examine the success of the case companies' endeavours. This was omitted as a lot of time would have been needed, but only limited additional data would have resulted.

To be able to answer the second research question regarding the Indian business climate, it was deemed necessary to include other sources of data than that obtained from the case companies to create a broader understanding. These sources also had to be easily accessible while still knowledgeable in the field, which lead our choice towards the Swedish Chamber of Commerce India and Swedish Trade Council as well as Arun Shivaram, Manager, Global Technological Centre, SKF.

The specific research questions formulated from the frame of reference presented in chapter 3 further limits the scope of the study.

# 4

## Methodology

*A structured method of research is vital to ensure the validity, reliability and functionality of the study. This chapter includes our view on the methods used and a discussion on the source of errors that might have arisen during the study.*

## 4.1 Research approach

In order to answer our research questions a research approach constructed as a mix of deductive and inductive reasoning (Creswell, 2003) have been chosen. To fulfil our purpose, namely finding reasons behind and effects from Swedish companies R&D establishments in India, existing theories were investigated to create a model later used for the analysis. The model can be seen as a hypothesis of important factors where the empirical observations later were utilised for confirming or disproving its parts. This is a part of the deductive approach (Yin, 2009). The observations and the collected data were also used in an attempt to look beyond the model and for improving its structure with factors and reasons for offshore R&D not presented in the theories. This represents the inductive approach (Yin, 2009).

Since the study only encompassed a few case companies a case study approach was used in accordance with Lekvall and Wahlbin (2007) who view a case study as a good approach for deeper investigations. The study performed is of an explanatory nature, described by Lekvall and Wahlbin (2007) as a study of factors that explain a problem. The choice of an explanatory study is motivated by the orientation of the thesis that mirrors the previous statement. The resulting study was made in a qualitative manner. This method is according to Yin (2009) best used together with an explanatory study and also does also follow the fact that only two companies were interviewed. Lekvall and Wahlbin (2007) see a qualitative method as a good way of obtaining deeper knowledge from deeper investigations based on interviews and observations and this method does hence fit the study performed in the thesis.

## 4.2 The process

The work process of the thesis is based on the U-model (see figure 16) proposed by Wahlbin and Lekvall (2007) for conducting market research where the model shows how the empirical data should be collected. Using this framework gave the work process a more clear structure and logic, which eased the performance and delivery. This structure also affects the readability of the thesis, and helps connect the different stages of the work together in an understandable fashion. The model used in the thesis:

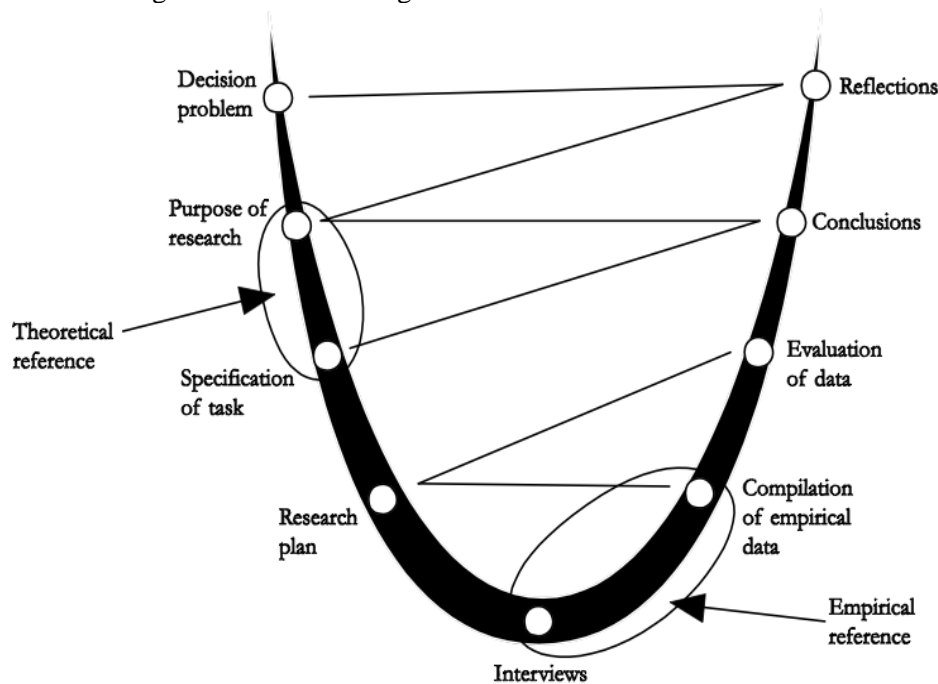


Figure 16 – U - model (Lekvall and Wahlbin, 2007)

The larger parts of thesis work lies in the theoretical reference and the empirical reference parts, but all the steps in the model above will be briefly explained: the *decision problem* refers to an insight that the existing information about a subject is insufficient and that more research is needed to be able to draw the needed conclusions. Once the research has started the *purpose of the research* has to be set to give a direction for the work, which is then specified with the *specification of the task*. The theoretical framework is constructed between the two last steps, first to aid with the specification of the task and later to culminate in a research plan. *Interviews* follow and the collective data is worked upon into a format from which conclusions can be drawn - the *compilation of empirical data*. The data is then *evaluated* and *conclusions* are drawn from the evaluated data and as a last step the conclusions are *reflected* upon.

As the thesis writing is a long and unpredictable process, the original plan was not followed entirely during the process. An example is in the step of specifying the task of the thesis which has been developed in a simultaneous manner with the purpose of research since they are closely tied to each other. The aim of the thesis was not fully defined before the work with the theoretical framework began and was slightly revised as new perspectives and information was found during the working process. The last parts of the thesis were written in a serial fashion, where the analysis was followed by conclusions and discussions. After the completion of each chapter, back tracking for better coordination with previous chapters was done, something which initiated smaller changes of the content of the same.

To facilitate the explanation of our use of the model, it has been divided into three different parts:

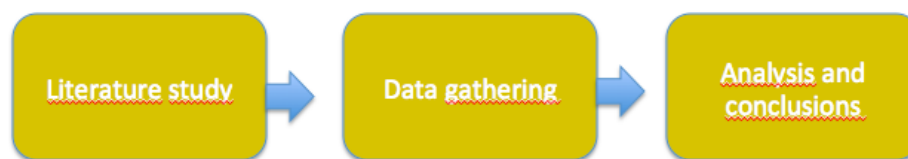


Figure 17 - Method for thesis work

### 4.3 Literature studies towards a frame of reference

Yin (2009) considers that constructing a frame of theoretical reference is essential for the whole study since it will later provide guidance for what data to collect and how to analyse it. The aim of the literature study was therefore to create a comprehensive frame of reference to use as guidance for data gathering and analysis.

After setting the boundaries for the thesis and mapping out relevant subjects to include in the study, a comprehensive literature study was conducted. A first, explorative attempt to find literature by browsing through books at the university library in Linköping resulted in a narrowing down of the subject list. The preliminary study was concluded with a two hour session with a librarian who helped out in finding relevant literature. All printed literature was either found at the university library or were previously used as course material for classes during our education. Printed literature was mostly used for general or basic knowledge where more detailed knowledge were captured in academic articles. Academic articles were, barring a limited few examples, taken from electronic sources mainly for reasons of simplicity and availability. Electronic sources used for finding academic articles were “Scopus” article search and “Database search” found on the homepage of Linköping University’s library.

The culmination of the frame of reference was a research model that was of help in the formulation of the refined research questions. It was based on key factors identified in each chapter of the frame of reference, which in itself was an important step since it helped narrowing down the theories and helped prioritizing the content in the frame of reference. To ensure the validity of the thesis, the literary study leading up to the theoretical framework was very extensive and effort was made to find as many factors for internationalisation and international expansion of research & development from as many different perspectives and sources as possible.

## 4.4 Gathering of data towards an empirical framework

The larger part of data used in the thesis is primary data that has been collected in interviews within the case companies and agencies like the Swedish Trade Council (STC) and the Swedish Chamber of Commerce India (SCCI). Complementary secondary data concerning for example company information and market conditions have been collected from the case companies' homepages and annual reports. During the interviews notes were taken by both authors and the interviews were also recorded to ensure that everything said could be written down accordingly and all nuances captured, raising the level of reliability. Right after finishing an interview a quick recap was made to capture nuances and the immediate interpretations of the answers, helping to write down things that would have otherwise been forgotten.

The case companies, Volvo and Ericsson, were chosen in collaboration with Growth Analysis. The amount of case companies was limited due to time constraints and convenience, where a thorough and deep analysis couldn't possibly have been made with a higher number of case companies. The specific case companies were chosen to give a good overview of two different, but highly relevant and interesting industries in India - the automotive and the information and communication technology sectors.

Most case specific primary data was captured at visits at the case companies' locations in the New Delhi area or Bangalore, barring a few phone interviews with case company personnel working or travelling outside India. Preliminary interviews were also conducted with the case companies, at the company headquarters in Stockholm and through phone to Shanghai, China. Interviews were conducted with company employees that have enough strategic insight in the companies' affairs to be able to answer the questions, i.e. managers at different levels, increasing the validity of the study. Other interviews were held at the Swedish embassy in New Delhi comprising embassy, STC and SCCI personnel with deep insight in the Indian business climate. The interviews were conducted in a semi-structured manner where a number of questions and topics were prepared for the interview, meanwhile providing the possibility of restructuring during the interview for flexibility to go deeper in different topics depending on the respondents. According to Lekvall and Wahlbin (2007) a semi-structured interview is well suited for a qualitative study.

To attain a high validity, the formulation of research questions was discussed throughout to ensure relevant replies for the study. Much effort was put into making sure to ask the interview questions in a way that encouraged the respondents to fully explain their point of view without hiding or forgetting any information and so that the questions were comprehensive. Interviews with five employees at Volvo and nine employees at Ericsson (see appendix and list of interviewees) were regarded as sufficient to provide enough information in the short timeframe of the thesis.

## 4.5 Analysis and the way to conclusions

After the data collection, all the gathered data was compiled into an empirical section which, together with the frame of reference was used to perform the analysis. As shown in the model by Lekvall and Wahlbin (2007), the latter parts of the thesis work interconnected to the earlier parts. The evaluation of data was done in accordance with the created model of analysis and conclusions were largely drawn with the help of the frame of reference. Finally, a discussion was held between the authors where the inductive parts of the analysis came into play, meaning that this part was also an important part of the analysis, but was not integrated in the thesis conclusions since it was not theoretically proven.

The generalizability of the results can be questioned, since only two case companies were included in the study. Yin (2009) writes that the case study research relies on analytical generalisation instead of statistical generalisation, which is easier to measure, but the results may still be generalizable. During the latter parts of the thesis, discussions were held with representatives with insights in these types of questions and a seminar was organised on the topic in New Delhi; both these discussions largely affirmed the conclusions drawn in the thesis. It is therefore deemed that the results are generalizable for Swedish companies, with minor discrepancies according to the different industrial prioritization of the companies.

## 4.6 Source criticism

As a principle all authors of the articles and literature referenced in the thesis are believed to be serious and accurate writers. To ensure the seriousness of the writers, only academic articles from respected journals were used as sources. Most articles were peer reviewed before publication to ensure their authenticity, which guarantees a high level of validity in our theoretical findings. Textbooks are in general written with an ambition to appeal to a large audience, hence they might forgo the more advanced academic reasoning found in academic articles. Textbooks have therefore mostly been used for further understanding of basic concepts of the theories in the frame of reference. There are also some articles that have not yet undergone a peer review, commonly known as working papers, and these may change their content before publication. There are also older articles and textbooks used in the text, whose relevance many years later can be questioned. The older articles are written by authors who laid the foundation of their respective fields and are also used to explain the fundamentals of those fields in the text.

## 4.7 Sources of error

Validity and Reliability are two concepts that are often used to explain how a study prevails in reality. According to Lekvall and Wahlbin (2007), validity refers to how well the level of a method of measurement actually measures the intended characteristic. Reliability, on the other hand, refers to the accuracy of the study and the degree/impact of random influences in the material. For the study to be considered reliable it will need a high level of reliability and validity. This has been attempted as far as possible. Regardless, all studies error in some way and this is an attempt to identify all the possible errors in the report.

Interpreting an academic text that is usually quite long, not in the authors native tongue and at many times frankly quite difficult to read is a demanding task. There is always a chance that the interpretation of the work is different than the author's original thought. It is considered though, that skills in English and in interpretation are good enough, still uncertainties may have risen.



Making high ranking company personnel reveal information about future strategies might be hard, and in many cases these operatives should not release this information to outsiders, making the answers incomplete. This was circumvented by asking general questions without going too deep into for example specific research plans or other classified information, so that the respondents could answer the questions without having to worry about confidentiality. The amount of hesitation of releasing information was perceived as very low during the interviews, but could still influence the results. Also, reaching out to the right people with enough influence in big, international organizations is very difficult, especially in a foreign business climate. In some interviews this was noticed in our respondents, who were a little short in their answers to be able to finish the interviews quickly. This might certainly affect the answers, but was luckily only seen in a small number of occasions.

The objectivity of the respondents is questionable since they are considered to have a strong personal connection to the company and thus can add personal values in their responses. In an attempt to reduce this effect and increase the degree of validity of the questions were formulated as objective and simple as possible, to reduce the chance that respondents interpreted them in a different way than intended.

Most of the information in the empirical data derives from just a few employees in the companies. To achieve a higher reliability, more people could have been interviewed in order to minimize the risk of a misleading picture of reality. Unfortunately time and budget constraints limited the number of interviews, so as to minimize the risk of errors, the data was examined critically and similar questions put to different people in order to examine whether the perception of the activities were consistent or not. Respondents were also reliable as information sources because their positions in the company ensured that they had the insight and information required in order to respond correctly to the questions asked, which increases the validity of the study.

Most of the company strategies are generated at the headquarters of every company, and in this case at the headquarters in Sweden. This can have an effect on the result of the study since only one interview was held at the headquarters (Ericsson). As many of the respondents have been working in the companies for a long time they might have had an influence on the forming of investigated strategies are considered to contribute to a source of error, but still some discrepancies might be found.

# 5

## Empirical study

*This chapter presents the empirical data gathered through the study. The case studies based on information gathered from Ericsson and Volvo are first introduced where the empirical data builds on interviews with representatives from respective company. Later additional empirical information concerning the Indian business climate is presented where the data presented originates from interviews with actors with insight in the research topic as well as from electronic sources providing information regarding the Indian business climate. The data presented in the chapter originates from information and reflections brought up by the interviewees and do not contain the authors' personal opinions.*

## 5.1 Case Studies

### 5.1.1 Ericsson

#### *Ericsson in brief*

- Number of employees: 109 000
- Number of employees in India: 13 850
- Number of employees in Sweden: 18 000
- Number of employees in R&D worldwide: 22 000
- Market presence: More than 180 countries
- Net sales (2011): SEK 227 billion

Ericsson is involved in activities ranging from provision of network infrastructure for mobile data traffic and internet connections, software solutions for support and business functions and consulting services related to networks and system integration. The company is divided into the following business units:

- *Networks*: Development and delivery of mobile and stationary network infrastructure and software.
- *Global Services*: Consultancy services, system integration, customer support and network rollout.
- *Support Systems*: development and delivery of software-based solutions for operations and business support and multimedia solutions.
- *CDMA mobile systems*: Solutions for mobile voice and data traffic.

#### **Overview**

Ericsson has R&D activities spread out on three different locations in India; Gurgaon and Noida in the capital region and Bangalore and Chennai in south India. The activities carried out at these locations focus on the business units Networks and Systems Support. The R&D carried out in India covers both local adaptation of existing products and solutions as well as research and development of concepts for worldwide use.

Ericsson sees India as an important market today and in the future with a large population, which thanks to an increasing standard of living will constitute a strong customer base and ensure demand for products such as networks for internet connection. Apart from benefits related to the mere presence on the market for insight in local demands and opportunities, India also provides access to a large amount of highly skilled workforce among which valuable specialist competence can be found. The Indian labour force is still relatively cost effective and accepts flexible working conditions, thus, usage of Indian labour is very beneficial for a global company as Ericsson. The business climate in the country has also developed and India is evolving as an attractive location for foreign companies' localisation of high value adding activities such as R&D. This leads to increased levels of knowledge and skills but also to a more competitive environment for competent talents.

The attraction of suitable workforce and practical education of the same for increased efficiency in tasks carried out in the workplace are examples of challenges for Ericsson in India. Other concerns are inferior standard of the infrastructure in the country as well as numerous and complicated regulations and bureaucratic procedures for business activities such as export and import to the country.

India is and will remain an important market for sale of Ericsson's products. The scope of the R&D activities in the country is planned to increase, and as the company aims to augment the globalization of the organisation, there are also possibilities for India to gain increased importance as location for other strategic functions. Despite a focus on globalization and decentralization of the organisation, the headquarters of Ericsson and many other strategic important functions will most likely remain in Sweden. The increase of activities in locations such as India will primarily concern expansion of existing operations and not relocation of resources from existing sites.

### ***Current situation for Ericsson in India***

Ericsson's R&D unit in India is the youngest one in the organization and currently employs around 900 engineers. Although the Indian unit is fairly small by Ericsson standards the research done there is in some cases state of the art on a very advanced level that makes it on par with any other advanced Ericsson R&D facility in the world. Both products and services are developed here, with predominance for services.

Ericsson is divided into four different business units, where Business Unit Networks (BNET) and Business Unit Support Systems (BUSS) are most prominent in India when it comes to R&D. Business Unit Global Services also has a large presence in India, with a focus on development rather than research activities. Ericsson India has around 14 000 employees compared to 18 000 in Sweden. Of the Indian Ericsson employees 2 100 are located in Bangalore for BNET and BUSS with 8500 employees located in Gurgaon and Noida just outside Delhi. All offices are also hosting IT, services, sales and marketing as well as various back office functions.

Generally speaking, the level of competence is higher in India than in China, still Sweden and especially Silicon Valley provides even better conditions for advanced technology development. The general competence level of the Indian labour force (also in Ericsson) is rising thanks to increased opportunities for working with highly qualified tasks in the country. Twenty years ago a majority of highly talented Indian students moved abroad after finishing their studies, which created a huge brain drain for the country. Today only about ten percent of the students relocate to other countries as the presence of foreign companies establish favourable working conditions in the home country. Job rotation and globally posted open positions are other tools that Ericsson uses to further stimulate creativity and innovativeness, and the company advocate that people should move over borders.

The Swedish company culture is rather visible inside the company - in the way of working, doing business and how employees and customers are treated. The company structure is quite flat and employees never have to use honorifics for their superiors, which give them a sense of freedom and equality.

### ***R&D strategies***

The target for the R&D performed in India is both global and local, even if the majority of it is conducted for global use. The activities aimed at the local market concern adaptation of existing products for matching with Indian standards as the product initially are aimed at more mature and saturated markets. The basic development of products is generally made in Sweden to then be refined at the local sites but the unit in India has also acquired responsibilities for development of solutions to be used on a global scale. The Indian R&D units currently have full responsibility over more than 10 different products that are used by telecom operators worldwide.

The products developed are constructed in a modular manner to make them easy to adapt to specific demands from customers with different needs around the world. There are very sophisticated processes for determining where R&D is supposed to be carried out, where cost per hour is set against value per hour and other metrics. High competence areas need to be carried out at locations that can provide high value contrary to only low cost. Ericsson has invested lots of resources in India, and the facilities there are starting to mature in the ability to provide value.

The overall R&D strategies are originating from Stockholm where the responsibility for operational adaptation and implementation lies on the local sites. The responsibility for decisions concerning overall strategic directions and financial matters for the different business units (for example decisions concerning investment in Indian R&D) is held by the respective business units managers who are located in the headquarters. The local functions are further supported by the headquarters in provision of input and information like global targets and benchmarking comparisons aimed at balancing the activities in the company for fulfilment of desired results. Strategies targeted at the market are laid out in five-year plans, from which shorter one year action plans are derived.

Domestic research and development units are not directly linked to the national organization in their respective country as they receive money and directions from the head of their respective business unit located in Stockholm and not from the country organisation. The local R&D activities are treated as costs for the company and resources given are hence seen as centrally allocated support giving the sponsoring business unit authority over the local research groups. As for independence and responsibility, the R&D organisation is structured so that the newer sites initially are closely connected to the main organisation with increasing responsibility as the local organisation matures. There is an effort to bring the project management to a local level, whereas it traditionally has been quite close to the headquarters. Two years ago Ericsson transferred responsibility for the product line Mediation Technologies to BUSS in Delhi - a project that has been successfully run since then even if a portion of the team remains in Sweden. This concept for project collaboration and local governance has been copied over to other facilities in India and other locations in an attempt to decentralize R&D.

The different business units' R&D is focused at various locations globally. For BNET the main R&D operations are based in San José, California, but some of the projects have been moved and expanded to Bangalore as the R&D centre has opened up there, mainly as an extension to the California unit. The importance of San José as research hub in this area is explained by the proximity to Silicon Valley, a well-developed infrastructure and supreme knowledge and innovation base. These are aspects that are very important for telecom companies that really need top of the line personnel in the R&D departments to stay competitive. As the competence levels rise in India, it is, as long as the labour costs stays at a comparably low level, profitable to move jobs from San José to India. In the current decrease of Ericsson personnel in Sweden as of 2012 it is not impossible that some of those jobs will re-occur at Indian units, even if this specific downsizing phase most probably won't concern R&D jobs but rather back office tasks.

### ***Driving forces for establishment of R&D in India***

In Ericsson decisions regarding localisation of units are based on an evaluation of important markets and the localisation of critical resources that are needed to run the specific activities. Right now India is rising in importance in both regards while Europe is decreasing in importance. As for the critical resources that Ericsson needs; knowledge and in many cases personnel capacity, features that the traditional R&D countries in the west can't produce on short notice, India has them in abundance. These resources are essential for Ericsson's expansion as it is a technology driven company. The will to hire personnel in Sweden and many European countries is somewhat affected by difficulties such as rigid and inflexible hiring conditions with long and complex procedures and difficulties to carry out rapid changes in numbers

of workforce. It is also risk mitigation to spread different functions to many places around the world. The English language level of the Indian workforce further facilitates the integration of employees, something which is valuable for a global company as Ericsson.

With the increasing economic importance of Asian markets, Ericsson also needs to have R&D presence in those markets to pick up the local needs and leverage from the huge opportunities there. There is a promise of large revenues in India, but this also makes the competition fierce. Having R&D in India does, apart from giving a chance to capture local need and demand, a reassurance for the Indian customers that Ericsson sees the country as important enough to invest, which give a sense of trust and support. There is certainly also cost benefit from being present in India, where a large domestic market opens up for economies of scale in comparison to a home market characterized by high wages and other costs disadvantages. As for R&D, cost is however not the main factor for an Indian establishment as the most important thing here for Ericsson is to acquire desired skilled personnel.

Ericsson, being an ICT company, had the tools to start their internationalization process early. As long as there is an internet connection, people working in the same project share the same workspace and platforms wherever they are in the world. The nature of Ericsson's products and solutions created an incentive to make use of this opportunity for globalization of the company long before many other competitors and industries. Today, most of Ericsson's competitors have gone through the same internationalisation process and their functions are present in India, China and other countries. This development has benefited Ericsson as the concentration of actors in the industry provide a telecom-business ecosystems that benefits the whole industry and all actors present.

#### ***Desired outcomes of the establishment***

Access to capacity and quality competence is the main reason for Ericsson to perform R&D in India and the company is generally very happy with the access to workforce in the country. It is also important to secure access to skilled personnel for future operations, something that India certainly can provide with its large and increasing population of well-educated engineers and rising competence levels. India is creating technology hubs in certain cities, where Ericsson can utilize the infrastructure and competence concentration for development of capacity in the R&D units placed there. The large population also means a large market that Ericsson wants to tap - something which is facilitated by the presence of R&D which can capture the local needs and demands.

A benefit of Indian employees is their flexibility - the workforce is very dedicated and willing to work on odd hours or weekends and they are also eager to catch up on lost time. To some extent this is possible due to gender inequality and usage of servants where the employees (especially male ones) have lower expectation to take care of children or household work back home compared to the situation in many western countries - Indian engineers have more time to work. However, Swedish employees are an effective workforce and perform very much in a small amount of time. Another employer benefit in India is the lack of employee unions, a fact that makes the labour market much more flexible with easy adaptation of number of employees according to the present need for workforce in the company. In a global competition, that is one of the factors Ericsson looks at when deciding where to locate units. India is hence a good place to hire if a large amount of workers are needed in a very short time, both because of the amount of engineers working and the flexibility on the job market.

Cost wise it is cheap for Ericsson to hire personnel in India, but skilled workforce is rapidly rising in cost and, in some cases, the special knowledge needed in R&D might even be more expensive to acquire in India than in Sweden. It is duly noted that cost is not the main reason for performing R&D in India anymore, but it was an important factor earlier when Ericsson established presence in the country. What is important for Ericsson today is to create value.

### ***Ericsson's take on the Indian business climate***

A sign of change in the whole political and business climate in India is that Indians that left the country to work abroad are returning, mostly because of better work opportunities in India. They are also bring back insights and competence concerning global market conditions and market demands which is valuable for the companies active in India as it improves the climate even further.

Important when Ericsson and other large companies evaluate countries for expansion is political stability and general security for the businesses where India has a rather favourable position. However, many rules and regulations in the country are inconsistent and complicated, which hinders effective interpretation and use. One such example is international trade where import and export is both expensive and complicated to carry out due to massive regulations. Corruption is seen as an issue, but has no direct effect on a day to day basis for the R&D activities. It might however affect other areas that in this sense influence R&D, but Ericsson has a comprehensive anti-corruption policy and strategies for handling officials that make it hard to extract bribes from the company. An unclear direction for reforms and regulations affects the business conditions but the country's business climate is developing in the right direction.

The interesting locations for Ericsson in India lie in cities providing access to technological clusters. Here the business climate is very beneficial since the politicians in these locations look favourably on foreign investment leading to creation of hot spots where both foreign and Indian companies thrive. These clusters bring much benefit for the companies with potential collaborations with local Universities, connections to actors in the industry and an abundance of skilled workforce, but they do also stimulate investments in infrastructure and other activities benefiting the whole society in the region. The focus area of respective cluster is important where the Delhi region for example provides high levels of skills in ICT-technology, which encouraged Ericsson to locate this type of R&D work there while Chennai have very skilled mathematicians. Unfortunately, many of the technological centres in India have an inferior infrastructure since infrastructure investments by the government and municipalities have not kept pace with the investments from companies. Bangalore, Gurgaon and Noida are examples of locations enlarging so fast that the city authorities and infrastructure development has not been able to keep pace with the growth.

Despite a large pool of talented engineers, it can still sometimes be a problem to find the right person for a vacancy - the competition for skilled employees is extreme in the cities and that causes inflated salary levels and creates a lot of attrition: people switch jobs very often. It is often a long process to find out who is competent enough for the job and most new employees also need initial training before they can start to work effectively. This stems from the fact that while India has a great amount of universities and students, there are only a few of them that offer quality education. While skill and talent is important, not all research and development activities have to be done by extremely talented experts. Over educating the workforce is unnecessary and will rid the cost benefits the Indian organisation provides. The Indian workforce is switching jobs very often to increase their salary and gain higher positions at work. This is a very big problem for the companies, so strategies are laid up in order to making the workforce stay as long as possible, with high wages, interesting tasks and job rotation. Problems arising from this dynamism come first and foremost from the discontinuity of work, but also from spread of company secrets that follow personnel to other companies. Ericsson is very good at closing off this type of intellectual property transfer with non-disclosure agreements and early patents on ideas.

### ***Future prospects***

Emerging markets are very important for Ericsson as they provide lots of opportunities for growth, for example within the mobile internet and cell phones markets where many potential Indian customers are yet to be connected. In more mature and saturated markets the growth opportunities are more limited as most inhabitants are already connected to the existing networks. Instead opportunities for increased



market penetration lie in the introduction and adoption of new technology which also is more difficult to make profitable. The challenge with emerging markets is the low revenue per user, where India has the lowest number of all Ericsson's markets. The financial crisis in the world does also have a significant impact on Ericsson's operations worldwide since telecom operators are reluctant to invest in new equipment during current market prospects. The impact is mostly visible for other functions than R&D as Ericsson is prioritizing R&D and technology expertise as a source for potential revenue and competitive advantage.

Ericsson's Indian R&D units are planned to grow slightly and in the distant future, in 20 - 30 years from now, India will most probably stay strong as R&D location for Ericsson with the provision of a large competence pool. Sweden and most of the western world suffer from aging populations and a decreasing supply of students interested in engineering and it already shows in the Netherlands where a R&D centre had to close down due to a lack of qualified labour. R&D units are placed where they can benefit from the local conditions, which in India are the workforce and the concentration of high tech companies. It is also hard to predict the needs for the future since there is a limit to how much R&D Ericsson has to perform globally.

Ericsson is and will remain a Swedish company in its identity. The headquarters will also onwards remain in Stockholm. An important share of company's R&D will also in the foreseeable future be carried out in Sweden as long as enough resources can be accessed there. It is beneficial to keep financially important functions such as R&D close to the headquarters for eased control, whereas functions with lower value creating activities are easier to move elsewhere. The fact that most of the members of the executive team are Swedish is also affecting the will to stay in the country. However, there is a movement within the company towards a more global way of working even for the highest management positions. CEO Hans Vestberg has made it clear that he wants to work towards a more international and globalized Ericsson. The practical details of those strategies are not public, but other power centres for company operations at important locations such as India are not impossible. An indication of this movement is the localisation of board meetings which now are carried out at various locations around the world and not only in Sweden. Changes that affect the whole organisation in large, international companies take time, but once the direction is set from the management the change will be more sustainable over a longer time period.

The strategic location of the R&D sites and their role in the global spread of activities is an influential factor for Ericsson's decisions concerning future localisation and investments in operations. The closedown of sites might therefore be a consequence of a general strategic relocation rather than an immediate lack of resources or high costs. India has a strategic location in a market with prospects for long-term value creation so the risk of a closedown of the sites in India is very small. The Swedish sites have a strategic location much because of the existing infrastructure and company climate built up from a historical presence in the country. The market opportunities in India are rapidly increasing, with the number of new phone subscriptions every month as big as the population of Sweden - numbers that speak for themselves when it comes to the likelihood of further investments in the country.

As the wages rise in India, there are other low-cost countries that are catching up as potential locations for R&D with increased attention from the company management. Some of those interesting regions are China, Mexico, Eastern Europe and the Philippines. The last one provides similar prerequisites as India when it comes to language since a large percentage of the population speak English. This factor may not affect the R&D activities that much, but many back office functions can potentially be moved to these countries.

## 5.1.2 Volvo

### **Volvo in brief**

- Number of employees: 120 000
- Number of employees in India: 3 900
- Number of employees in Sweden: 30 600
- Number of employees in R&D worldwide: 10 000
- Market presence: More than 180 countries
- Net sales (2011): SEK 310 billion

Volvo Group is a global manufacturer of trucks, buses, construction equipment, and drive systems for marine and industrial applications. The company is divided into the following business units:

- *Group Trucks*: activities related to the development and sales of trucks within the Volvo Group. Subdivisions including support functions and joint ventures for trucks.
- *Construction Equipment*: manufacturing of products used for construction work and similar industries
- *Business Areas*: products including buses and penta (engines and drive systems) and other complementary functions as government sales and financial services

### **Overview**

Since the establishment of Volvo in India in 1997 the scope of activities have developed from a small group working on local adaptation of products towards a globally integrated organisation employing around 1000 workers within the field of R&D. The Advanced Technology and Research Department, located in Bangalore, is today working with development of products targeted for the local market, concepts that also can be spread to other emerging markets with similar conditions, but also concepts directly aimed at global usage.

The Indian market demands a development of more simplistic but still rigid solutions that suits a price sensitive customer base. These products do also need to cope with the harsh conditions of roads present in the country which stimulates frugal engineering with a starting point in the local demands. With a history of acquisition of several prominent companies in the automotive sector, the Volvo group has the opportunity to make use of respective brands for a differentiated branding and pricing strategy as well as take leverage from technical competence and existing R&D facilities. Volvo's low cost trucks being sold in the Indian market are hence branded under the name Eicher which allows development and provision of low cost products without damaging the reputation as a high quality alternative. These products named as "value trucks" are also intended to be spread to other markets and the R&D unit in India is hence globally responsible for the development of this concept.

The closeness to the Indian market with following insights in the local conditions and demands for development of targeted offers is also the main reason for Volvo to locate R&D activities in the country. Other benefits from having activities located in India are the access to competent workforce, especially engineers. These benefits are both present in terms of a large amount of well-educated labour but also following a concentration of multinational actors working in the automotive industry stimulating development of technical competence at the location. India is still also considered as a fairly attractive location when it comes to value creation in relation to the costs of labour and running of operations. The main challenges in the Indian business climate relates to lack of practical skills for recently graduated engineers and burdensome regulations and policies regarding business performed in the country. These

challenges are however not considered to have any major negative impact on Volvo's interest to locate R&D activities in the country.

As Asia and India specifically are seen as important markets with huge potential yet to be tapped into, Volvo plans to not only maintain but also expand the R&D conducted here. With an increasing need for insights and specific competence for development of offers suitable for these markets, it will also be of importance to have a strategic focus on this region. This is part of the general strategy for Volvo where decentralization of responsibility and increased international integration on the management levels are important focus areas for the future. It is hence likely that India will play an even more prominent role in the organisation in the future even if Sweden will remain as main location for central management of the Volvo Group.

### ***Current situation for Volvo in India***

The Volvo Group has recently completed a major change in the organizational structure leading to a larger focus on globalization and reorganization of globally targeted functions. As an example, the Volvo truck division is organized in regional areas and then in functions such as sales, promotion and R&D. Volvo's R&D function in India, Volvo Technology, was earlier working with adaptation of technology and concepts to the Indian market needs. In order to gain organisational benefits the function is now more integrated in the global organization under the name of Advanced Technology and Research (ATR).

Volvo has been present in India since 1997, when a factory was opened in a village close to Bangalore. The initial development here was aimed to support local adaptation of products developed in other R&D centres and offshoring of simpler tasks, initially with a staff of 8 engineers. In 2005 the scope of the R&D activities realized in India was changed towards an increased focus on products aimed for the global market, meanwhile also developing the locally targeted activities. In 2005 the site in India was also expanded with other functions like purchasing and support functions and today there are slightly less than 1 000 employees working with R&D at the headquarters in Bangalore.

Europe is still the number one source of revenue for Volvo. Asia is currently in second place and is quickly increasing, potentially passing Europe because of the huge, untapped potential in the rapidly expanding market compared to a more saturated demand in Europe. The country with the highest revenue for Volvo Trucks is China, but India is placed at the second position. In India the main market segments are mining, where high quality imported trucks are used, and the mass market segment where customers demand simplicity and low price trucks. The market for trucks sold in the middle of the price range has so far been relatively small, but is according to Volvo, an opportunity as India's economy grows.

Volvo has been expanding globally through acquisitions of other companies like Renault, MAC and Nissan, both in the trucks segments and other business areas like Buses and Construction equipment. The Volvo brand is mainly aimed at the premium segment and is mostly used for mature markets. In India these Volvo trucks are mostly used for heavy duty work in mines and construction sites. Volvo Eicher Commercial Vehicles is a joint venture between Volvo and the Indian truck manufacturer Eicher and the two companies are running manufacturing sites throughout India together. Volvo mostly provides knowledge and technology where Eicher provide a manufacturing base, a well-known low cost brand for trucks in India and a large sales organisation. The bulk of trucks sold by Volvo in India are therefore sold under the Eicher brand which can provide cheaper trucks for light and medium loads which are more suitable for the price sensitive local customers. The multi-branding strategy is widely used in Volvo as a mean for offering products in various price categories without diluting the premium value of the original brand. The goal is however to grow the market share by the premium Volvo branded products from 0.4% today to 15%. Another example of Volvo's branding strategy in India is taken from the bus division: as Volvo was one of the first entrants of the Indian premium bus market 2001 and has since then dominated

the market segment. The whole concept of travelling in an air-conditioned bus is called travelling “Volvo class” instead of the more conventional name “first class” in other countries.

Bangalore has been the IT hub of India, humorously called Silicon Alley by the residents, but is also developing into an automotive hub with companies like Mercedes, Toyota and Scania establishing activities in the vicinity. Being an automotive centre attract competent workforce to Bangalore, which all companies in the industry have a use for. They also gain valuable experience from working for different international companies in the business.

### ***Strategies for R&D***

The present major R&D locations lie in Gothenburg, France (Renault), the US (MAC), Japan (Nissan) and Bangalore with local adaptation centres in Australia and Brazil. The largest of these R&D units is still Gothenburg, but Bangalore has quickly sailed up as the second largest R&D centre for Volvo and the plan is to expand it further with 300 engineers in the near future. Volvo’s R&D activities carried out in Bangalore cover the whole product development chain in contrast to many competitors that mainly locate specific steps of their R&D activities in India. Volvo’s activities range from initial design plans to development of prototypes and design of parts and systems leading to products fully researched and developed in India.

A majority of the R&D in India aims at the local market, but an increasing share of Volvo’s Indian R&D output is also used on a global scale. An estimation of work allocation is that 20-30% of the resources are used for the development of value trucks for the Indian and emerging markets, 20-30% are for supporting global projects and 25% is allocated towards support for other functions like buses and construction equipment. The Indian R&D department has over the years since the initial establishment gained trust and maturity, which has led to allocation of more responsibilities for development of more advanced technologies. What Volvo Group as an organisation wants to learn from its Indian division are the frugal engineering skills and cost effectiveness that are ingrained in the Indian culture. This is also reflected in the development activities performed here, where focus lies on cost effective solutions that suits the quite underdeveloped Indian truck market. Each global R&D centre has its own focus area and the Indian site is hence responsible for the development of the relatively new concept of “Value trucks”. These are trucks developed for growth markets with less buying power, why cost effective solutions lacking more advanced functions seen in trucks sold on more mature markets are developed. The development of these products is fully originating from the conditions present in India and similar markets, and it is hence not a question of downsizing and leaving out functions of an existing European Volvo truck. An example of the differences between the products is a focus on rigid solutions that can stand the generally less developed Indian roads which requires durable parts rather than advanced technological features.

There are many possibilities to achieve synergy effects between products developed within the Volvo organisation, among different site locations and business units, for example concerning shared components for trucks and buses. Following this, the R&D divisions in India are also working close to each other as small business functions like Volvo Buses cannot afford to have their own R&D units. To enable and realise these synergy effects Volvo works with modularity and product platforms that can be used in several products around the world. There are close collaborations between R&D locations across the globe to ensure that essential knowledge and technology capacity is present at all locations, especially for the activities concerning local adaptation of existing concepts. Many projects are also realised by multinational teams bringing together personnel from different development centres. With development of IT-technology and communication solutions an increased globalization of the organisation is possible enabling simultaneous work from various locations all over the globe. The R&D teams usually meet up once a week to coordinate the project work through a virtual environment. Despite the online coordination mechanisms there is however a need for a critical mass of strategic personnel at a given location to ensure that the work can be carried out in an effective way.

The Volvo Group has a clear hierarchical structure and all major strategy decisions are made by the company management and strategy group located at the headquarters in Gothenburg. In the process of formulating strategic directions information is collected from all parts of the organisation to provide a basis for the strategic decisions being made for the next few years. This process is spread out over a long time period which is also reflected in the length of the strategies developed. Product roadmaps are for example mapped out for an eight year perspective due to the time-consuming development processes of model platforms and other features, especially in terms of research and development of future technologies. The organisation is also rather decentralised so once general decisions and strategic directions are transferred to the various business areas the local centres takes over much of the responsibility for adaptation and realisation of the strategies. Volvo's joint venture projects, like the one with Eicher in India, exemplifies this with a high level of responsibility for setting up strategic and operational plans for the unit.

### ***Driving forces for establishment of R&D in India***

The main reason for Volvo to be in India and Asia in general is the possibility to tap into the potential of the markets now and in the future. Asia is already a major source of revenue for Volvo, but what's more important is to be present to get a good foothold for future market prospects. An important part of that strategy is local presence in fields other than just sales, and especially local R&D is a crucial mean for capturing the local needs of these markets which are very different from the home market. Designers located in Sweden or France can probably have a theoretical understanding of the local conditions but it requires practical experience from living in the present circumstances to translate this into understanding of what customers actually demand.

Another aspect of the presence in India is the ability to monitor and leverage from the activities carried out by competitors present there so that Volvo can stay on the front line. Volvo established its activities in India earlier than other European competitors largely due the company management's ambition to globalize the company's activities. India has a strategic position between North America, Europe and China which is a benefit mostly due to time aspects but also when it comes to connections for trade and general market strategies.

### ***Desired outcomes of the establishment***

The most important reason to establish R&D in India is the benefits gained from being present in the huge Indian market, with a lot of potential growth. For a company like Volvo that is in the business of making technical products for everyday use, it is almost impossible to succeed in a country like India without local product development and research due to the simple reason that it is crucial to capture what the Indian customers need. This has to a large extent been explored and used to start R&D projects in India, for India.

Volvo wants to tap the large pool of engineers and other educated workers that India is supplying in large quantities. This workforce is also attractive since it generally has a good English knowledge that simplifies the integration in Volvo's global working environment. That India is in a favourable time-zone also help in the way of making business, and the global workforce can then work around the clock to finish projects.

Cost effectiveness is also a factor - there is a possibility to make more for less in India compared to the western markets, even if this factor has decreased in importance for R&D and other areas as the cost for hiring labour increases. The Indian cost awareness is also something that Volvo wants to learn and spread through the organisation. Frugal innovation or frugal engineering which describes a type of engineering practice that aims at reducing complexity and minimising non-essential functions in the product. This

opposed to traditional western engineering methods where more focus lies in integration of additional and more advanced functions.

### ***Volvo's take on the Indian business climate***

India is a market with some challenges especially in terms of labour and infrastructure conditions. Although the country provides a large amount of University graduates, it is very hard to find the right talents which have the desired competence. The cost for attracting and keeping the right talent is further increasing rapidly, especially in technology hubs like Bangalore where the presence of many multinational companies creates a competitive environment for attraction of skilled labour. The newly graduated students that Volvo hires are often in need of introductory training during their first year of employment since their education is lacking experience from practical elements and skills which are needed in the workplace. It is also common among Indian engineering students to stop studying after their bachelor degree, but Volvo aims to hire master and doctorate graduates in order to attain the right levels of knowledge and skills. Compared to Indian students that are good at specific moments and tasks, Swedish students and engineers have a broader competence and are more open minded in their way of working.

The Infrastructure in India is considered as quite bad, but the situation is improving since the problem is recognised at a political level and large efforts are put in to solve the issues. The democratic features of the Indian society and the lack of hindering censorship and other strict policies have facilitating effects for the business climate compared to countries such as China. The political climate in India does in general not affect the R&D activities that much, but the fact that there are different regulations and conditions between the states throughout the country complicates business. The Indian government is actively trying to attract foreign direct investment in R&D to India and there is also competition between different Indian states to host international companies. R&D activities are subsidised by the central government which also works towards facilitated conditions for larger investments and construction of sites in the country.

### ***Future prospects***

Asia and especially India with its large population and market potential is seen as a very important market for Volvo and this region is also the location where the company's focus lies in the foreseeable future. There is still a lot of potential to tap on all the different markets and Volvo will work towards reinforcing the position that the company has in the country. The next step to undertake for Volvo Trucks in the region is to launch the value truck concept that has been researched and developed fully in India. This product concept will also be launched in other growth markets with similar market demands. If Asia is the current focal point of Volvo's expansion plans, then Africa is the next target. Here Volvo sees a possibility to enter the different markets before their competitors, a strategy much alike the successful initial establishment in India. The strategy of local R&D will also be followed in order to capture the local need and demand.

The mass market in India does still focus on trucks in the lower price categories but Volvo sees an opportunity in trucks of the medium price range which will be explored in the near future. The quality of the trucks in this segment will still not be high enough to warrant the use of the Volvo brand for these products, but Volvo Group has quite a few other brands to use. Until just recently the different brands in the group were competing in the market but the new strategy rather concerns an extended collaboration and co-development of platforms between the brands while still keeping the different attributes and values associated with every brand. It is very costly to keep several development projects for different markets and brands and therefore it is likely that the all-round product solutions for which after some adaptation can be used in various application areas will be more common in the future. The need for local adaptation will still remain with a continuous emphasis on locally placed R&D.

Another R&D trend that is visible among companies in the industry is collaboration projects with universities. University collaboration is an important part of Volvo's research in Europe and in the USA, where the funding of large public research projects are shared between the universities and Volvo. The plan is to start up and increase the amount of University collaboration in India too in the field of transport solutions, traffic security and infrastructure that will both benefit Volvo and the Indian public. Volvo today has collaborations with the Indian Institute of Science in Bangalore and is planning to develop ties to other universities for R&D cooperation and attraction of skilled workforce.

The headquarters of Volvo will most likely stay in Gothenburg for the foreseeable future even if the responsibilities for activities will be more spread out accordingly to the accessibility to special competence and resources. In line with an increased global scope of Volvo's activities with growth in several countries and continents, centralised management of the company will be difficult. Even though ICT based communication technology is developing fast, the general opinion stresses that there always will be a need for a company headquarters where a management team can work together to form company strategies based on shared company visions and long-term perspectives. The R&D decisions might be more spread out in the future following a decentralization of responsibilities throughout the different sites. Also the executive management of the company will need to reflect on these different markets in order to support decision-making derived from the local needs. This with members from national backgrounds other than just Europe as is today's situation.

The establishment and expansion of R&D in Asia does not imply a decrease of scope of activities in Europe but the case is rather that Volvo's additional growth mainly will happen in Asia. Different locations are responsible for different product areas - it is not a competition among the different locations but a decentralization of activities which complement each other. There are plans to expand the R&D department in Bangalore by about 50% in the future and the future plans concern for example an increased scope for engines for growth markets to replace engines developed in Europe to better fit the local needs. These engines might also be used on a global scale in trucks sold on mature markets. Volvo is not looking to concentrate R&D in one country but is on the contrary trying to spread it out the activities in order to be able to pinpoint the local needs - not only for Asia but for more mature markets like Europe and the US. It is also a matter of spreading the risks for large scale happenings like natural disasters like earthquakes or tsunamis.

## 5.2 Additional empirical information

The following chapter aims to provide an understanding of the Indian business climate surrounding the case companies and other Swedish companies with presence in India. The text is mainly based on information from and interviews with representatives of the Swedish Trade Council and Swedish Chamber of Commerce India. Other sources are also investigated for a broadened picture of the topic. These sources include other written materials concerning the Indian business climate as well as interviews with Arun Shivaram, Director Global Technical Centre India, SKF and Klas Eklund, Chief Economist, SEB. The interview with Klas can be found in the appendix.

### 5.2.1 Introduction to the Indian Business climate

#### **Summary**

India as a market has a very large potential, where both the market size and the large workforce are attracting foreign companies. Much of the economic growth is fuelled by domestic consumption from a growing middle class enjoying increasing prosperity even if the economy has had a comparatively large downturn because of the global crisis. There is much potential in India but the Swedish companies' show a decreasing confidence in the Indian market after the crisis hit. There are also certain aspects with the Indian market that create a challenging business climate such as bureaucratic procedures, an inferior

infrastructure and deficient power supply. The political climate, although generally stable, is relatively unpredictable and complicated regulations in combination with large duties tend to favour local business meanwhile foreign companies meet more constraints. The country also faces problems with corruption and it is also a problem that a large part of the economy is undertaken in the black or grey markets, mainly as a way to escape complicated and costly procedures. There is however a will and initiatives set in place to solve and ease these complications in the business conditions, both from the government and the general public.

The large base of well-educated workforce, which is growing every year, is a big asset for India as destination for FDI and establishment of foreign-owned R&D. The educational system is however differently structured compared to western conditions and recent graduates entering international companies are often in need of initial training in order to be fully employable. The market conditions in India are very diverse from European markets and foreign companies need a high degree of local understanding to be able to focus efforts and investments on the right activities in the Indian market.

### ***Political conditions***

The political dimension of business life in India is of great importance as there have been many years of regulations and obstacles for expansion of business activities. From the liberation from the British Empire until the 1990s Indian companies were not allowed to expand globally and the government was in absolute control over the industrial life. Under pressure from a huge financial deficit and high inflation rates, reforms were gradually introduced from 1991 to open up the Indian economy for foreign investment. The business climate in India today is highly affected by lacking efforts for stimulation from the government. Some reforms are though put in place for opening up for new opportunities for foreign companies in the country. Trade, and especially cross-border trading is where India's reforms have made most impact and efforts are underway to implement a uniform goods and services tax throughout the country although it is progressing slowly. As India is a federation, there are also local business regulations that differ widely between states which can complicate the realisation of companies' decisions. As an example, it would take around 80 days to get permission to build a warehouse in Hyderabad, but almost six months longer in Kolkata (Doing Business in India, 2009). There is certainly a need for thorough investigations of state-wide conditions before establishing companies or starting offshoring operations, especially as the conditions for FDI varies among different states. Continued reforms and politically driven incentives aim to increase the FDI and international collaborations among international and domestic actors in India. Increased FDI and more indirect foreign investments in sectors like education and infrastructure are very important to enhance the development of the business conditions in the country.

Unclear and continuously changing conditions and regulations on taxes, licenses, permits etc. are other circumstances that companies have to deal with. The processes for import and export are complicated with high fees for import. This affects companies' possibilities and will to transfer goods to and from the country, in turn hampering business. These laws are defended as an attempt to protect domestic actors from "unfair" competition from abroad and different pricing and generally diverse conditions for domestic and foreign players on the same market are challenges for all foreign companies doing business in India. Laws and regulations regarding IPR are well up to global standards, but require quite some paper work and navigation among complicated regulations and policies.

Red tape, or excessive bureaucratic procedures, is severely affecting productivity in India. The lack of transparency in the political system further creates uncertainty and delays regarding political decisions, which in turn hinder a more effective development of the business climate. According to Doing Business in India (2009) around 80 percent of India's economic activity takes place in the "informal sector", or in the grey areas of the economy due to the massive bureaucracy and regulations associated with joining the "formal sector". In this way success tends to depend more on contacts and family relationships rather than



entrepreneurship, which in turn is deeply unfavourable for the development of the whole economy as well as it creates unfair competitive conditions between domestic and foreign actors present in the country. The issues regarding corruption and uneven business conditions are considered a serious problem in the Indian society.

### ***Economic conditions***

India is already a major economic player and the economy is expected to grow strongly in the next decades. An increase in disposable income for the large group of middle class consumers has led to a denotable increase in living standards for that group. India's current share of the world's population is 17 percent, but it accounts for only 1 percent of world trade and less than 2 percent of the world's GDP. During the years 2004-2009 India faced an economic growth average of 8,6 percent annually, though due to worsened economic conditions in the country and worldwide, the growth for 2012 is by IMF predicted to stay at 4,9 % (IMF, 2012). An annual survey among Swedish companies present in India showed a decrease in confidence in the development of the Indian economy compared to the recent years but in general the Indian business climate was still considered to be rather favourable.

Domestic consumption is fuelling the Indian growth and private domestic consumption represent 50 percent of the annual GDP. India offers foreign companies a significant potential for profitability, and is the second most attractive destination for foreign direct investment, mostly due to its growing service and telecom sectors (WEF, 2011). Since the opening up to the world market in 1991, the FDI in India has risen from less than US\$ 2 billion to US\$ 123 billion in 2008 (Mukim & Nunnenkamp, 2012). The main areas for FDI in the country in terms of R&D investments are ICT, aerospace, financial services, the automotive sector and the life science industry. It is relative easy to get access to capital in India but instead there are costs related to the sourcing of capital which makes domestic financing unfavourable.

In the Indian market factors such as geographical, cultural and infrastructural conditions call for local adaptation of products and offers. One obvious difference to Europe or US is the conditions of the roads in cities as well as on the countryside where there often is a lack of asphalt, something which implies a demand for development of automotive solutions that can stand harsh conditions. More cultural differences are the fact that religion and traditions have a strong impact on the Indian society and limited economic conditions do also largely affect the consumption behaviour.

### ***Infrastructure conditions***

Swedish companies present in India stress the lack of proper infrastructure and its adverse impact on growth, where infrastructural aspects like roads, power supply, air quality and water supply are seen as poor with water and garbage management considered outright bad. The regulations and policies affecting the development of the infrastructure differ from state to state, having a large impact on where companies decide to locate activities. In general, the construction speed of infrastructure as well as buildings is increasing following efforts by state and government to enhance the progress of urban development.

### ***Labour market conditions***

Locating business in India is profitable for various reasons related to workforce. One of them is the large base of well-educated citizens that facilitate for companies to find exactly the kind of niche competence they are looking for. In 2011 India had around 17 million students enrolled at more than 630 universities, 33 000 colleges and 3 400 engineering colleges as well as a large number of technical institutions. It is estimated that more than 500 000 engineering graduates pass out every year. The Indian labour force stood at around 480 million people in 2010, and 16% of the population have university education (Doing business in India, Ernest and Young, 2009). The large and well-educated workforce provides a solid base

for potential employable labour, but the recent graduates do not necessarily possess sufficient levels of skills and knowledge to be directly employable. The mismatch between the competence levels of university graduates and requirements of companies is due to several reasons: the Indian university system is highly focused on information gathering and learning large amounts of knowledge rather than acquisition of skills and problem solving approaches which would be more common in for example Europe. Traditionally, students have also chosen educational programs based on status and career prospects rather than interest and talent, which in many ways narrows the students' fit for the job.

For the foreseeable future, lower labour costs provide India with a durable cost advantage. Expenses for highly educated and experienced labour rise rapidly though, also reinforced by inflation, and according to the last business climate survey a large majority of the Swedish companies see a decrease in the cost advantage for India as a location for their operations as they predict the costs for labour to increase, especially for the white collar workforce. The fast-moving labour market and lacking employer loyalty is moreover considered a challenge, where many employees switch jobs so often that they won't have time to create value for the company.

### **5.2.2 Arun Shivaram on the conditions for Swedish companies locating R&D in India**

Arun Shivaram has a thorough experience from many years of work within the field of R&D in several multinational companies in India. Based on this, as well as his current position as director of SKF's Global Technical Centre in India, he has a solid ground for insights and perspectives on the conditions for foreign companies conducting R&D in the country. This chapter presents his reflections on the topic of the thesis seen from the point of view of a manager of a multinational company present in India.

#### ***Market demands and localisation of R&D***

Closeness to customers and crucial markets are major factors influencing international companies' location of activities such as R&D; if the customers are located all over the world the R&D activities need to be too in order to serve them and their demands. In order to enable further growth, multinational companies must reach out from existing saturated markets and make use of emerging markets such as Asia for leveraging the diverse and rapidly changing needs and market opportunities. India is here a region that offers immense market opportunities both now and in the future when the population and living standards are predicted to increase. The special conditions in the country with an infrastructure and consumer behaviour differentiating the market from many western counterparts creates a need for locally adapted products and solutions and therefore also a need to be located close to the market. This, together with the large domestic supply of workforce (especially engineers) is an important reason for international companies' location of high value-adding activities like R&D in the country.

The Indian market is in general built up by a demand for simplified solutions and modest products offered at lower price levels compared to western countries. Product features which are crucial in western markets may have low priority for the Indian customers. The differences in demand follow various reasons such as differences in infrastructure or climate related conditions. This is a variable that opens up for diverse offerings adapted to this specific market demand, something which also would allow companies to have differentiated pricing strategies on the Indian market. A trend among Indian customers is however a movement away from a primary cost focus towards a higher emphasis on value creation and maximal outcome for investments spent. This together with an increased globalization of markets with internet as resource for comparison of offers and prices has had an impact on the possibilities for differentiated offers towards customers on different markets, also in India.

### ***Labour force conditions in India***

The large talent pool in India is undoubtedly an important asset and point of attraction for companies locating R&D in India. However, due to the Indian education system with a strong theoretical focus students do in certain aspects lack practical skills and applicable knowledge required for being able to directly step into productive working positions. Rather, there is a need for on-the-job training and educational activities for capacity building once the graduates reach the workplace. Once the employees are well integrated in the company another challenge awaits as the Indian labour market is both competitive and fast-moving seen from the employer's point of view. With many multinational companies present in industrial hubs such as Bangalore, Delhi and Mumbai the competition for the most skilled and competent talents is very high. Therefore efforts and resources need to be spent on attracting and retaining the competence gathered and developed within the company.

When a foreign company first establishes business in a location like India, the main organisational challenges arise from uncertainties regarding the purpose of and procedure for the formation of the operations. It is important to anchor reasons for the establishment of activities at the specific location and give clear directions for what is expected from the investment from a managerial point of view. Especially for Indian employees it is important to feel that their work is part of a bigger picture in the company, something which puts additional pressure on the employers' ability to provide meaningful tasks also in the start-up of new operations in the country.

### ***Internal organisation of strategic functions***

Increased diversification of markets will drive multinational companies to become more decentralized, where local subsidiaries gain more responsibilities stretching all the way to strategic matters. The technical development of communication solutions also provides good opportunities for international collaboration and teamwork across geographical borders. Meanwhile, there will always be a strive for a centralized strategic team within organisations as this is a way to concentrate and leverage from the knowledge and competence that exists in the company. Headquarters of European companies do also often remain at the original location or close by even during an international expansion and reasons for this may be such as access to competence and an established organisation at the home location. A plausible development of international companies is hence an enhanced decentralization of organizations with local and regional subsidiaries where market and sales organisations, and sometimes also R&D, providing abilities to adapt offers to the respective markets. A central coordinating mechanism, geographically concentrated or virtual based, will still give possibilities to leverage from synergy effects and global competence through coordinated and shared procedures and activities. This strive for synergy effects is also visible in the location of R&D operations. Existing internal units in the market in regard will here help the adaptation to local conditions but also open up for internal information and competence sharing.

# 6

## Analysis

*This part of the study aims at analysing the empirical findings and their compliance with the frame of reference. The analysis is derived from and supported by the framework presented in the model of analysis which serves a starting point, although the analysis also opens up for perspectives and empirical findings not previously mentioned in the theoretical background.*

## 6.1 Driving forces

The geographical dispersion of R&D activities is influenced by a wide range of factors and mainly discussed in chapter 2.2 (Research and Development), but also throughout the frame of reference. Here follows an analysis of these factors divided into the areas globalisation, competitiveness and resources.

### 6.1.1 Globalisation

Globalisation in a corporate manner is in chapter 2.1 (Globalization of value chains) described as an interchange and integration of ideas, information and goods but also as crucial part of the company strategy. This is demonstrated by both Volvo and Ericsson that consider them as the most globalised players in their respective industry while also stressing the need to be a local actor in the market. The basic definition of globalisation in chapter 2.1 includes homogenized markets that incrementally emerge due to interconnected international trade. For Ericsson as well as Volvo, the market needs in India and other growth markets differ quite a lot from their traditional western home markets and the markets around the world are thus still very heterogeneous despite the internationalisation. To be able to act in diverse growth markets the companies stress the need for local presence in the field of R&D, but with different strategies utilised for its implementation. Ericsson mainly develops a global technological platform which is further adapted for each local market, where Volvo in many cases develops products directly based on the local market needs.

As a consequence of maturity in western markets where the sales volumes are quite stable, both companies have partly shifted focus towards the growth markets in Asia to reach an accelerated growth. The financial crisis in the European market has had a substantial impact on the financial situation for both companies but this impact has not affected the expansion plans for R&D, contrary to the prediction of halted expansion due to increasing costs for loans as was mentioned in chapter 2.3.4 (The future of offshoring). Ericsson states that the company implicitly is looking for current market opportunities and conditions when deciding on location of and investments in their international R&D centres. Volvo on the other hand states a focus on future potential of important markets when deciding where to expand their operations.

With its competence in the ICT sector, Ericsson has been able to benefit from frontline solutions in communication technologies also for internal use. In line with a distinct strategy for global positioning of the company this has been of use for an early start in experimenting and expanding internationally distributed R&D, facilitated by these technologies for communication and coordination of activities. The international focus is still relevant today where present CEO, Hans Vestberg, has presented a desire to internationalise Ericsson even further. One initiative concerns an increase in foreign backgrounds of members at the top management level of the company where the members traditionally have been of Swedish origin. This is a clear example of the “management intentionality” factor spoken of in chapter 2.2.2 (Organisation and localisation of R&D) where the top management has a clear goal, in this case to globalise the company, which steadfast will be executed. The technological breakthrough in ICT has also had a large impact on Volvo’s decision to internationalise their high value adding functions. This action was also based on the intention to attain a more international workforce and was partly realised through procurement of competitors in other countries and continents. After a recent restructure, the company focus has changed to an increased collaboration among the brands existing in the group and an orientation towards an augmented global company structure.

## 6.1.2 Competitiveness

Recent theories discussed in chapter 2.3.2 (Factors behind offshoring decisions) agree that one of the most important factors for deciding upon a company's R&D location is skilled workforce. This is also a factor that the case companies agree on is having utmost importance. Using Buckley and Ghauris' (2004) model, the labour market is still considered as foremost being a national business while the capital market as well as goods and service markets to a large extent are considered as international. This is confirmed by the case companies' statements that labour conditions at different locations are different but the workforce still has to perform on an international level. The western countries are starting to lose momentum in the field of skilled labour for R&D operations (2.2.3, Trends in internationalisation of R&D) and the underlying causes are identified by both theory and case companies as the aging population and a decreasing interest in science and engineering studies. For Ericsson this is very noticeable as lack of competent workforce in Europe leads the company to expand its R&D to new markets in order to access the amount of engineers required for development of competitive technological excellence.

The classical reason, found in chapter 2.3 (Offshoring), for a company to establish or in some cases move functions like R&D to a lower cost country is a high cost of performing the activity in the home market. According to Ericsson, Sweden is in many aspects a high-cost location for realisation of activities in comparison to India or similar countries. Ericsson stresses that the cost of performing R&D is less significant to the localisation decision in contrast to the importance of the quality and outcomes from the exercised R&D, an opinion which is supported by Volvo. In countries like India and China, where both companies have a large market presence and supply of crucial competence, the labour costs are rapidly rising. Although, as long as the outcomes of the work carried out is satisfactory, the companies are willing to invest in India.

To be able to compete in a market that is fundamentally different from the home market, there is in most cases a need for local research and development. Chapter 2.2 (Research and development) and 2.3 (Offshoring) highlight the need for understanding of local market conditions; knowledge concerning cultural patterns, business conditions and especially local needs which only can be acquired through presence at the location. This fact is stressed by both Volvo and Ericsson, who see a local presence in important markets as a basic requirement for the creation of competitive advantages. Ericsson also feels that a local R&D is reassuring current and potential customers in that market, giving them a sense of priority and eased access to support solutions. Volvo advocate customer interaction as well as a local workforce to increase understanding of local conditions and demands, well in line with the current trends of internationalisation of R&D described in chapter 2.2.3 (Trends in internationalisation of R&D).

Competitors' actions and their establishments are closely monitored by both Volvo and Ericsson. Volvo sees competitors' interest in different markets in Asia as an incentive to develop their own activities in order to keep up with current trends and thereby ensuring their competitiveness. This corresponds to the identified factor "Peer pressure" in chapter 2.3 (Offshoring) which states that companies tend to follow each other's actions out of fear to miss a potential opportunity. Volvo does also serve as a valid example of the beneficial position obtained from being the first actor in a market from their own establishment in India where they outperform their direct competitors that entered the market at a later stage. The company does still and will most likely also in a foreseeable future benefit from this head start. Also Ericsson strives to not let competitors remain unchallenged in essential markets, but nuances the picture a little by bringing up the perspective that more competitors present create a competitive, but profitable and innovative ecosystem for companies to thrive in. Closely related to the Peer pressure factor is the factor "Competitive pressure", where the competitive climate almost dictates companies to offshore activities to lower cost countries to increase margins when competitors already have taken this direction. As costs of

R&D activities decrease in importance, the competitive pressure should rather concern benchmarking of the locally performed R&D, especially for large markets like India and China.

### **6.1.3 Resources**

According to theories in chapter 2.1.1 (Global value chains), the geographical spread of activities in the value chain is driven by factors like lower cost and, especially from an R&D perspective (2.2.1, Internationalisation of R&D), access to a geographically scattered competence and resource base. These aspects are naturally corresponding to the reasons given by the case companies for dispersing R&D - in short a need for expanded and more diversified competence throughout the whole value chain. There are according to theories two reasons to add a new research node: to cost effectively access critical knowledge that could not be found otherwise, and to tap into capabilities for a faster, better and cheaper delivery compared to options in the existing network (2.3.2, Factors behind offshoring decisions). For case companies, needs for critical knowledge and better/faster/cheaper performances are present, conditions which are feasible to access from different technological hot-spots. High cost following multiple R&D centres do however conflict with the need for R&D dispersion and therefore Ericsson is trying to limit the number of different R&D locations in line with strategic and financial premises. Statistics in chapter 2.3.3 (Factors influencing location) point out India and China as major locations for offshored R&D sites indicating that many companies see strategic value in having R&D present there.

While the Competitiveness section highlights the need for skilled workforce in an international labour market, there are complex reasons why competence gather and thrive in certain locations commonly known as technological hot spots or clusters of competence. With benefits for present companies, business regions and whole countries (2.2.1, Internationalisation of R&D), governmental efforts encourage origination of hot-spot environments by favourable policies, public funding opportunities and infrastructure attracting companies and workforce. These elements do together create a climate stimulating competence development, innovation and competition from which the companies can benefit, for example through access to competent personnel and special knowledge required for their R&D. Different types of clusters are present worldwide where Volvo for instance is represented in a large cluster in Gothenburg, Sweden, concentrating the automotive competence in Scandinavia. Also Ericsson has different centres of excellence located in hot spots, like Silicon Valley in California, where the company is present for accessing valuable competence and an innovative climate in IT and services.

Another mean for accessing technical competence is the utilisation of cooperation with external parties for R&D. These enable minimized costs and spread of risks but the main reason is the access to skills and knowledge meanwhile benefiting from possible spill-over knowledge emanated from the interactions (2.2.4, External collaboration in R&D). For the case companies the interesting external parties mentioned in the study are mainly universities which can assist in “basic research”. Also these collaborations are closely tied to hot spots as universities tend to specialise in research activities present in the surrounding industrial environment.

## **6.2 Desired outcomes**

### **6.2.1 Organisational outcomes**

A desired organisational outcome from internationalisation of R&D, especially highlighted by Ericsson is the access to capacity and quality competence - also declared as the most important factor by the theory (2.1.2, Localisation of activities and 2.3.2, Factors behind offshoring). For both case companies, India provides a good basis for skill and knowledge that is utilized for both local and globally targeted development. The access to labour is especially prominent in the technological hot spots, where Volvo has found its natural position in Bangalore – one of India’s automotive hubs, while Ericsson utilises special

competences of the different hot-spot cities to leverage from R&D competence which fits into different parts of the company's activities. Ericsson expresses a need to secure knowledge and competence for future operations, where India with its huge amount of educated workforce is crucial in that strategy.

Chapter 2.3.2 describes work-flexibility as the opportunity to realise 24-hours work with different teams "working around the clock" due to different time zones. However an important benefit in India comes from the working climate with the workforce's dedication and responsiveness to irregular working hours. Ericsson values the commitment of the Indian employees, who are willing to work during odd hours, weekends and long days to catch up on lost working time or during intense periods. Volvo is of the opinion that beneficial labour laws and the large amount of available engineers make India a favourable country when there is a need to scale up and down operations quickly according to the present needs. Ericsson also sees these benefits compared to most European markets which have strong employee unions and very strict labour laws.

The cost benefits were according to chapter 2.3.2 the main reason that companies started offshoring activities, and this was also a major part of both case companies' initial strategies for the Indian R&D establishment. In line with most recent theories in different chapters (2.2, Research and Development and 2.3, Offshoring), the importance of low cost R&D has significantly decreased when the emphasis has changed from simple and specific activities towards more complex and value adding tasks as well as increasing responsibility for the local organisations. Ericsson highlights the need for high-level, well performed R&D, especially for organisations depending on frontline technological solutions, for which high level of competence and quality is crucial to acquire, whatever the cost. The fact that both case companies are planning to stay or expand their activities in India despite rapidly increasing costs for special competence clearly indicate the cost factor's lower importance. It also shows that India evolves from being a country associated with low cost activities to a country providing higher value activities. Volvo looks for cost effectiveness, a balance between qualifications and cost that Manning et al (2008) mention. This is a factor where India is still very strong and where thorough cost consideration is rooted deep in the culture - a mind-set that Volvo would like to spread throughout its whole organisation.

The desired outcome for both case companies' activities is performance of R&D for both a local and a global level, with a slightly larger focus on the global level. The research carried out is comparatively small for both companies which have main research hubs closer to the headquarters in accordance with the theories (2.2.2, Organisation and localisation of R&D). The product and, in Ericsson's case, service development is though prominent in India. Ericsson uses existing, global modules for the basic product and refines, tweaks and integrates the original concept for local markets. As a reflection this R&D strategy probably works well due to the fact that Ericsson's products comply with international standards while also being technical equipment with few direct consumer interactions. Volvo's products, buses and trucks, are utilised by people in direct contact with the end product and hence Volvo needs to customise its products more to the local requirements.

### **6.2.2 Market based outcomes**

As for market-based outcomes, both Ericsson and Volvo see the need to be present in the local market to be able to tap into its potential, mainly to get knowledge about the local conditions and needs and enable fast reactions to events in the region. The presence also speeds up the delivery of tailor-made services and products. Benefits from early access to the market are clearly demonstrated by Volvo's example, where they are out-selling their international competitors, gained a good reputation and good cooperation with Indian companies. In Ericsson's case the company gained a good reputation as a stable employer that attracts competent workforce. According to chapter 2.1 (Globalisation of value chains) and 2.3 (Offshoring or offshore establishments), local trade restrictions are a barrier for market access and India certainly has some restrictions for FDI, but none that affect the access to the Indian market for either



company in a crucial way. Indian bureaucracy is however quite excessive and almost demand local teams working with these legal issues.

### 6.3 Current R&D strategies

Trott (2005) define four types of research and development activities (see figure 11 in chapter 2.2) where each type has different strategies attached. Generally, as explained in other theories in chapter 2.2 (Research and development), the more knowledge and concept based a certain type of R&D is, the closer to the headquarters it will be performed. This is shown quite clearly in the strategies of the case companies so far, where a large amount of technical service and product development is performed in the offshore locations, with India as an example, while most research is still done in Sweden. Especially Volvo is very keen on cooperating with universities in research activities to gain the special competence that different institutions possess.

The spread of R&D locations as a strategy to leverage from local competence is mentioned several times in the theory. Kuemmerle (1997) describe the phenomena of R&D units located abroad with the purpose of gaining from the local competence as home-base-augmenting sites, meaning that the outcomes from activities undertaken abroad are later transferred throughout the organisation for use at several locations. This corresponds to Ericsson's as well as Volvo's operations where a large part of the R&D in India concerns global projects with contributors from various parts of the world. Some concepts and solutions that are initially developed for the Indian market are also of use in other markets, with a great example of Volvo's development of value trucks - the Indian value trucks are not exported, but they can serve as a source of inspiration and an initial concept which can be further developed for other markets. Volvo's activities in India can also be related to the other alternative presented by Kuemmerle (1997); home-base-exploiting sites where focus of the foreign located R&D activities lies on support to the development of offers for the local market. Also Ericsson has a certain amount of R&D activities targeted towards local adaptation but this aspect is less prominent than what is the situation for Volvo.

As multinational actors, with activities spread out all over the world, Ericsson and Volvo are continuously exposed to differences in market demands and changes in competitive conditions from global as well as local actors. According to the model presented by Zedwitz and Gassam (2000) both case companies have a dispersed organisation of development activities following a global market reach with highly diverse local conditions and demands. A majority share of the research undertaken is still located closer to the headquarters in Sweden, especially in terms of initial concept development and basic levels of research (see chapter 2.2, Research and development). On the other hand, the outplacement of R&D also serves as a mean for acquiring competence from various sources at the different locations, relating to the dispersion of research for tapping into high technology competence. For Volvo, the location and nature of R&D operations follows the acquisition of other corporations which have contributed with existing organisations and activities in the field of R&D, such as Renault's R&D unit in France or Nissan's in Japan. Ericsson's activities can somehow be placed in the upper left corner of the model (see figure 12 in chapter 2.2.2, Organisation of R&D units) where a major share of research and functions of strategic significance are found at the home base. From there fundamental knowledge and competence is transferred to foreign subsidiaries for use in the local market and for further application in more advanced projects. Volvo can, on the other hand, be considered as a company having both research and development activities spread out on a global scale, placing the company in the upper right corner of the model.

## 6.4 The Indian business climate - facilitators and complicators for localisation of R&D in India

### 6.4.1 Macro conditions

In the localisation of R&D activities, aspects concerning business climate and business conditions are given thorough consideration by the companies and the Indian business climate is often referred to as relatively favourable. According to the study, the availability of competent workforce and cost effective activities are among the top prioritized aspects in the decision of location but infrastructural, economic and legal conditions also have an influence. The theory considers factor conditions such as provision of electricity and solid roads as important aspects influencing the decision (see section 2.4, Influence from the Indian business climate) and these are also brought up by the case companies but are not regarded as major influencers.

The economic conditions in the country, as seen in chapter 2.4, have an impact on the will for investment, especially when external funding and collaborative opportunities are crucial elements of the realization of R&D activities. According to the study, this is of particular importance for smaller companies that are in need of funding while entering India. The conditions for FDI are also essential for the attractiveness of the market, something which the Indian government and especially the different states recognize and are trying to facilitate and encourage. In general the political and economic climate in India is considered to be rather stable and Volvo mentions India's democracy as an advantage position compared to alternative locations.

According to the discussion in chapter 2.3.3 (Factors influencing location), conditions for IPR protection and overall legal and economic security are influential factors for the willingness for foreign investment in specific countries. In India, these conditions are considered favourable by both Ericsson and Volvo despite a bureaucratic mode of procedures. With a streak of corruption and lacking transparency in the political arena it is difficult to predict and rely on plans for implementation of reforms and decisions. Both Ericsson and Volvo recognise this problem in the Indian society, but are at the same time not considering these aspects to have a direct impact on the daily execution of R&D in the country. A plausible reason for this minor impact is the structure of the R&D activities which to a large extent are organised and governed from an international organisation without much connection to or dependence on local actors. Instead, the major concerns regarding the Indian economic conditions brought up by the case companies and other respondents relate to complicated regulations, especially regarding import and export of goods. Complications due to trade policies and taxation aiming to protect domestic actors are also brought up in the theory (see chapter 2.4), but with a suggestion that these difficulties will diminish following the company's integration with the society. Taxation and general policies and regulations concerning the business conditions also vary greatly between different states, something which has an important impact on the localisation decision for activities in India.

The market conditions in India are in many aspects very different from those present in Europe. Not only is India itself as diverse as Europe when it comes to geographical differences within the country, the variations in culture and lifestyle are very much noticeable even between cities and more so between states. Differences in the consumer goods market are mainly visible in the consumption habits religious aspects and regional traditions and habits whereas the difference for the industry rather lies in infrastructure and geographical conditions. Price sensitivity and different views of value creating features are other aspects that Volvo has to adapt to by differentiated product offers for the local Indian market. The need for locally adapted R&D and offers are in many aspects brought up in prior research. Sometimes these conditions can be considered even if product development is made at a distant location, but, as mentioned in chapters 2.2.1 (Internationalisation of R&D) and 2.2.2 (Organisation and localisation of

R&D) local presence and thorough understanding of the market is often necessary for development of targeted and well suited offers. With India's large and expanding population and market it is, as brought up by Ericsson and Volvo as well as the theory (see chapter 2.2.3, Trends in internationalisation of R&D) important to understand and tap into the drivers and conditions at this market, now and for the future to come.

#### **6.4.2 Industry specific conditions**

For Ericsson, access to well-developed corporate infrastructure and competence is important for the localisation of high value-adding activities like R&D in India and globally. These are also features which put clusters of prominent technology companies like Silicon Valley high up on the companies' list for attractive placement of R&D activities. Noida and Gurgaon in the capital area and Chennai and Bangalore in the south are all locations accommodating clusters of high tech companies and are considered regional hubs for ICT and the automotive sector. The concentration of multinational companies at these locations further stimulate domestic investment in infrastructure and other features which helps the creation of technological ecosystems, something that both Volvo, Ericsson and other Swedish companies find as a substantial benefit. These clusters also increase competitiveness and a rapid interchange of labour force among present employers. Combined with collaborative activities with nearby universities this creates a stimulating knowledge environment in the region. Benefits from being present in such an environment are brought up in the literature (see chapter 2.2.4, External collaboration in R&D and 2.3.3, Factors influencing localisation) as well as by the companies in the study. The risks concerning spill-over effects of intellectual property through interactions are mentioned in the frame of reference (see 2.2.4) but none of the companies are overly concerned about this in India where the IPR system can prevent such effects.

The collaborative activities that Ericsson and Volvo are engaging in with Indian universities partly takes the form of joint R&D projects but also concern the attraction and recruitment of potential workforce. The interaction with the universities is critical for bridging the gap between the very theoretical Indian educational system and a working environment with high demands for more practical capabilities as problem solving skills and creativity. The limiting levels of applicable technical know-how and employable proficiency among Indian engineering graduates are regarded as a complicating circumstance for the workforce in India. This leads to a need for profound on-the-job training and competence development where both Volvo and Ericsson are executing trainee programs for new employees in order to raise their capacity. After the extra education, the Indian employees do however provide work efforts of internationally competitive standard with flexibility in working conditions and a relatively high level of English proficiency. A parallel from these challenges can be drawn to the liabilities of foreignness presented in chapter 2.4 (Influence from the national business climate), where a foreign company often face challenges due to the lack of experience of the local business climate. Here the need for activities increasing employability of the Indian workforce can be considered as an extra cost of adaptation of a foreign organisational structure and way of working to the local present circumstances. However, Indian companies also face similar challenges, so in that sense it is not necessarily a competitive disadvantage for foreign companies. On the contrary, a more structured form of knowledge sharing and introduction to the work environment takes place and the employees are equipped with competences that can be used on a wider scale in the organisation.

A sign of India's increasing appeal as location of knowledge and technology intensive activities is the fact that many Indians who earlier moved abroad for better work opportunities are now returning to India for the same reasons. This inflow of competence is very valuable as the large number of Indian university graduates does not guarantee companies to find labour that match their need of competence. Certain areas of technical competence are not widely taught at the universities and the wrestle for top talents among multinational companies present in India is fierce, especially in technological hubs as Delhi and

Bangalore. Together with a strong inflation in the country all this contributes to an increase in salaries and inflation, diminishing India's status as low-wage country.

### **6.4.3 Organizational conditions**

Both Ericsson and Volvo already had well-established operations located in India when larger scale investments in R&D were carried out during the past few years. In this way the adaptation to the Indian business conditions was never a major difficulty.

Both Ericsson and Volvo see themselves as global companies with a strong Swedish origin visible in the mentality and corporate culture. This foreign company culture does not seem to meet any difficulties in the workplace in India. The opposite is rather evident as multinational companies are often providing very favourable working conditions in comparison to their Indian counterparts, which are very appreciated by the employees. Availability of communication tools facilitates a global workspace but a lack of face-to-face interaction and time differences complicates collaborative activities. In the theoretical discussions concerning standardization of procedures (see chapter 2.1.3, Integration and standardisation of activities), geographically distant locations and diverse local needs are brought up as constraints for effective implementation. Both Ericsson and Volvo use globally standardised working methods where managerial strategies and goals are used as steering and coordination mechanisms. In Ericsson major plans and strategies for the R&D in India are derived from respective business unit located in Stockholm, followed by a transformation into local implementation plans. The units in India are though also responsible for the execution of an increasing number of projects that are facilitated by the shared procedures and working methods. In Volvo's case the general management in Gothenburg is providing directions that are transferred down to the local units. Work rotation on a global scale helps knowledge and competence transfer within the company but does also ease the implementation of shared procedures. This supports the idea brought up in section 2.1.3; with the increased globalization and simple and well-spread means for communication, the importance of geographical location of units is rapidly vanishing.

## **6.5 Future prospects for localization of R&D activities**

As stated in the starting reflection over driving forces, the globalization of markets will continue to affect the strategies and operation of Swedish companies worldwide. The trend of increasing need for flexibility and a spread of high value-adding activities in the production chain (presented in chapter 2.1.2, Localisation of activities) is followed by the case companies and the other actors included in this study. Rapidly changing market conditions and needs force multinational companies to stay on the edge, not only in terms of technology development but also regarding allocation of workforce and resources (see chapter 2.2.3, Trends in internationalisation of R&D). Ericsson believes that the high competence activities have to be located at places where the highest value can be derived from the resources invested in costs and labour, triggering a continuation of the globalization process of the company with a decentralization of managerial and technological responsibilities. In this perspective, both Ericsson and Volvo will most probably increase their international scope of R&D activities, corresponding to a movement towards the upper right corner in the model presented by Zedwitz and Gassam (2000) in figure 12 in chapter 2.2.2 (Organisation and localisation of R&D). In accordance to the model, R&D units will be located at widespread international locations, close to available front-end competence and understanding of particular local market conditions. Both aspects are crucial for the companies' R&D activities where global coordination enables acquisition and use of competence and technologies in local operations as well as in global collaboration projects across the organisation.

As the theoretical framework in chapter 2.2.3 (Trends in internationalisation of R&D) suggest, the increasing local differences in customer demands encourage localisation of R&D units close to the end users. Emerging markets, where early presence is crucial, need local R&D to attain customer credence and

leverage the effects of tapping into unexploited market potential. With the huge market potential in India and nearby locations, Ericsson, Volvo and other actors interviewed in the study see the country as an obvious location for R&D activities both presently and in terms of expansion in the future. This is above all due to the profitable conditions India provides for growth and potential future revenues and a generally favourable business climate (compared to similar alternative locations) underpin this positive approach. Ericsson's R&D unit in India will according to the plan see a subtle growth during the coming years and Volvo's R&D unit in India is aiming for a significant growth in the next year. The desire for product offers in the lower and middle price range segment and the innovative solutions derived from this can further be of use not only in India but also in other markets. The R&D competence present in India will therefore be an important asset for Volvo in the future. This global use of locally developed products also correlates with the trends for globalisation of locally derived R&D presented in section 2.2.3. In terms of future markets, Volvo also looks into Africa as potentially important source of revenue whereas both companies have rather pessimistic outlook on the European market, partly due to the last years' financial crises. A future expansion of R&D for reasons such as closeness to market demands would therefore, more than Asia, rather concern the African continent even if none of the companies mention this explicitly during the interviews.

As the expansion of R&D activities and increased responsibilities for global operations undertaken follows the supply of specific technical competence, it is not obvious that an increase in R&D in India will have any direct correlation to a potential decrease of workforce in Sweden. For Ericsson, an increase in the international scope of the company's activities will also rather than R&D activities, concern lower value adding and more basic operations which foremost will be placed at locations that can provide lower costs. In this aspect, not even India would be able to compete with many other low-cost countries. In India the cost for R&D is however yet relatively low compared to other company locations, even if costs, especially for labour are increasing. Still, with a substantial pool of well-educated labour and technical competence, India can weigh up a potential augmentation of costs by providing high quality in the field of R&D where high competence is a crucial resource (also discussed in chapter 2.2.1). India can, thanks to the large number of graduate students, supply the companies with engineering competence even though there, according to the study is a need for further competence development of the workforce for effective employment. In comparison, Sweden faces a potential decrease in technical competence as an aging engineering workforce and lacking interest for STEM subjects among university students risk undermining the ability to supply companies with skilled competence. This is also a consideration both case companies bring up in the discussions about the future prospects for R&D activities located in Sweden.

Following a decreasing importance of geographical location of operations in favour of accessibility to cost effective and value providing resources arose a diffusion of operations in multinational companies (see chapter 2.1, Globalisation of value chains). Arun Shivaram (Director SKF Global Technical Centre, see chapter 5.2.2) agrees with the theory presented in chapter (Integration of activities in the value chain) that ICT solutions present today enable coordination and collaboration in widespread multinational organisations. However he also brings up the strategic importance of maintaining a centralized hub of competence and managerial functions in these decentralised organisations. In highly internationalised corporations, the headquarters will still provide the most favourable location for concentration of company specific knowledge and coordination mechanisms for the operations. The arguments for this relate to the physical concentration of knowledge and experiences which, at least not today, can be replaced by virtually based means for communication and interaction. Volvo moreover brings up the gains from a centralised strategic team which can align the company's vision and strategies, something which has an increasing significance in geographically widespread organisations. Both Ericsson and Volvo intend to maintain their headquarters in Sweden for a foreseeable future in spite of an increased internationalisation of their operations. Not only is the company culture still strongly linked to the country of origin, where

Swedish industry is perceived as provider of high quality and reliable outcomes (see chapter 2.4, Influence from the national business climate), also many of the stakeholders in respective company have strong connections to the country. The reasons for keeping the headquarters in Sweden or Europe does also follow the concentration of knowledge and experience in the region, which is considered being a competitive advantage compared to Asia.

The placement of strategic important functions and an increased responsibility for global operations in India gives an indication of an increased interest in locating strategic operations at this location in the future. Seen from the discussions undertaken within the study, it is not unlikely that multinational corporations in the future rethink their organisational structures, opening up for increased spread of strategic power as in the rise of several headquarters. This action would however rather be an expansion of power sources to strategic important locations than a delocalisation threatening the function of the original headquarters (as mentioned in chapter 2.2.2, Organisation and localisation of R&D), for the case companies located in Sweden. The drive for internationalisation of top management and strategic levels in the organisations is for Ericsson visible in the attempts to diversify the executive board and a potential move of this function to a more virtual based work-situation. This can be seen as a sign of the company's will to tap into understanding and experiences from different markets, something which will be crucial for development of global strategies, especially on emerging markets. For Volvo's part, the company is working towards closer collaborations across markets with module components and solutions which can be used in several application areas and locations. Together with increased focus on local input in decision making processes for strategic matters this indicates a will to employ local know-how and market insights also here.

# 7

## Conclusions & discussion

*With a base theoretical and empirical study and subsequent analysis, the following conclusions have been possible to draw as attempts to answer the purpose of the study. The conclusions presented take a starting point in the current situation for the case companies' R&D in India. The second part of the chapter presents personal reflections and discussions related to the topic for the thesis and the results from the empirical study. Last the usability of the model of analysis, used as a framework throughout the study, is discussed.*

## 7.1 Conclusions

### *Identifying the most important factors behind the decision of locating R&D abroad*

#### - **Increasing international focus in the R&D activities**

The localisation of R&D activities is an increasingly international affair with units spread out over the globe. Driving forces such as globalisation of markets, saturated home markets and lack of technical competence force Swedish companies towards pursuing internationalisation of R&D. The global spread of these activities aims at facilitating development of offers with closer connection to needs at specific local markets. Access to local technical competence can also be used for a global scope through collaborative projects and spread of developed products to several markets.

#### - **The prospects for growth are found in emerging markets**

Presence on fast growing markets is crucial for multinational companies ability to keep up or accelerate growth when more mature markets provides small margins for revenues and tough condition for further expansion. Presence with R&D units is on these markets provides access to potential high revenues from large numbers of customer and possible future expansion but also highly skilled labour which is sorely needed for development of suitable offers to serve these local (and also global) markets.

#### - **Placement of R&D units follows access to workforce**

Availability of skilled labour is crucial for performance of high value activities such as R&D and access to competent workforce is therefore of high importance in the decision making process for location of R&D activities. An increasingly internationalised labour market enhances the competition for workforce, and as the concentration of technical competence is also shifting from western markets towards locations like India or China. Labour and companies active in technological areas are often clustered in hot-spots, cities providing favourable business conditions stimulating knowledge creation and innovation, adding value for R&D activities. Presence of R&D units at such locations, especially where competitors are present, is hence a way to keep up competitive advantages.

#### - **Technical solutions enables a globalized workspace**

With technical development of communication solutions, virtual collaboration and coordination across national borders is widely present in multinational companies, something which decreases the importance of geographical closeness of operations. Multinational working teams are common and projects can include input from as well as use of outcomes on widely spread locations. Having R&D located in various parts of the world can also give access to specialist competence and market insights which can be transferred across the organisation. This also follows a general trend observed in the study where multinational companies move towards more decentralized organisational structures. R&D is then placed at strategic locations with close access to crucial markets and high competence rather than as traditionally seen, closer to the headquarters. This is of importance for the concrete products developed but also as input to a higher level in the organisations where decisions for future strategic directions are taken.



### ***India plays an important strategic role in the companies' global R&D operations***

#### **- India is and will be an important market**

Emerging markets such as India and the rest of Asia stands for the current and future growth in the world economy. Important corporate activities are already located here and India is becoming a natural location to place R&D for domestic and global use. With a large population and increasing standard of living, the country shows huge potential for revenues for companies that manage to access and capture shares in the market. The market conditions in the country are in many aspects diverse from those found in western markets and local presence is therefore crucial for understanding and development of targeted offers.

#### **- R&D located in India can be used for local and global application**

Swedish companies' R&D units in India are, according to the case study, part of larger global strategies with operations targeted for the local Indian market as well as for a larger, global scale. Not only is local R&D indispensable for development of offers suited for the domestic market, the outcomes from the R&D performed can in some cases also be of direct use, or at least work as a source of inspiration, for other markets worldwide. The large availability of skilled workforce is also widely used for the development of global products where the R&D units in India are acquiring greater responsibilities for global projects and products leading to increased strategic power at these locations.

#### **- India provides favourable conditions for performance of R&D**

Indian labour conditions are considered satisfactory with high levels of knowledge among the employees and a high quality level of the R&D performed. The Indian labour regulations enable a flexible working environment where the number of employees can easily be adjusted according to current needs, a benefit compared to the conditions in for example, Sweden. The Indian educational system is highly theoretical, limiting the fresh graduates' capability to perform practical job assignments and spark a need for initial training and integration in the companies. An increasing inflow of Indians who have left the country earlier for work assignments abroad shows the increase in attractiveness of the Indian business climate and does also enhance the level of skills and experience in the country.

#### **- R&D in India is beneficial from a value creation perspective**

Following an increased focus on value creation from invested resources, India has, with a high accessibility to skilled workforce and an accumulation of high technology competence, an advantageous position as a present and future location of high-value adding activities. Like the development of the European business conditions during the last decades, India is facing an even faster increase in costs for labour that risk to impair its attractiveness as a location for R&D operations. Still, as access to the right competence is pointed out as one of the most crucial factors in location of R&D this seem to have a minor impact on companies will to locate R&D units in the country.

## 7.2 Discussion - Sweden's role in a global world

The thesis work opened up for opportunities to meet several people with interesting views on global value chains and Sweden's role as R&D nation in a globalized world. Among them are Klas Eklund, Chief Economist at SEB and Fredrik Jejdling, Head of Region for Ericsson in India. Moreover, participation in seminars about Swedish-Indian trade relations and Sweden's climate for innovation and research intensive activities has given interesting insights related to the thesis topic. The text in this chapter generally derives from the thesis work, including interviews and seminars, but the reflections brought up are the thesis writers' own personal opinions.

Taking a starting point in Sweden's ability to compete with other alternative locations for R&D activities, the first impression based on historical achievements is that Sweden is comparatively well prepared to face an increasing global competition. However, following increased globalization and shifting economic focus from the western world towards India and Asia in general, there are many challenges that a small country like Sweden has to overcome in order to be able to continue to play a prominent role for current and future placement of high value activities such as R&D.

Historically Sweden has had an unproportionally large role in the world economy as well as in the field of research and development taking into consideration the country's percentual share of the world's population. This position has in many respects sprung from a high educational level and a focus on innovation from a state as well as a corporate level. Today the general educational level in the world is rising rapidly; emerging markets are developing their educational systems giving large populations access to basic education as well as advanced university education. These rising levels of competence rapidly diminish the competitive advantage Sweden has had as, expressed in the commonly used term, "knowledge nation". With a decreasing interest in technical education from Swedish students noticed in the theory, during interviews with the case companies as well as with Klas Eklund and from personal experiences, there is a risk that Sweden's position in the fields of technical knowledge is further undermined. This situation can create potential hazard for Sweden's high tech industry, but might as well be a trend that reverses over time.

From what is seen in the study, the easiest jobs to offshore, or move due to cost reasons are less value adding activities like call centres or other back office functions while high value adding functions like R&D tend to be performed closer to the home locations of companies. The higher value adding functions also tend to be performed with less regard to cost but rather based on quality aspects, a field within which Sweden has a strong position. With a national industrial context which is highly influenced by a few large multinational and technology intensive companies employing a large workforce (such as the case companies) Sweden is in a way vulnerable to the effects of outplacement of value creating activities as R&D to other locations. These companies do, and according to Klas Eklund should not, have any loyalty to their home country and will most likely perform their operations at locations where they can extract most value. The comment on the topic by Fredrik Jejdling is that activities to a higher extent will be moved to locations which give the most benefits, this based on a view by multinational companies as being global actors rather than being of nation-specific origin with attached loyalty. For this, Sweden needs to be able to provide a business climate that makes domestic companies keep and expand activities in the country as well as attracting FDI. Interventions that can support such a development are broader perspectives on and support to innovative activities that open up for small and medium sized companies to explore opportunities, and also on campaigns to increase focus on technical competence in the country.

Compared to India, Sweden is favoured by a political climate that is characterised by understanding, consensus and adaptability between the political sides - sorely needed to give a small country like Sweden competitive advantages. With a clear, transparent system of taxation, a fair and equal educational system

as well as infrastructural conditions and investments that are consistent and predictable over time, Sweden attracts companies looking out for sustainable and well developed business conditions. These circumstances are also creating a reputation of Sweden as a trustworthy country which in the long run helps to attract FDI. High taxes and the strict labour laws are in many perspectives beneficial for the public as such, but have side effects like inflexible labour market and costly conditions for corporate activities. As long as there are good incentives for companies to hire Swedish labour this is a fact that can be overlooked, but as many other alternative locations around the world provide more flexible labour conditions, Sweden may need to review the robust labour laws in order to stay competitive and keep operations and following jobs in the country. In the long run, Sweden does have qualities enabling a competitive position for the location of high value activities like R&D, even in comparison with countries as India or China that have large amounts of educated engineers and general labour force. According to Fredrik Jejdling, those in power in Sweden should not have even the slightest worry about the country's role for the R&D of Ericsson. The collaborations between state, universities and companies are making the Swedish environment very beneficial and dynamic and should be encouraged!

In the future, Sweden has to find its own niche to focus and create comparative benefits in particular areas. It is not possible for such a small nation to acquire a world leading position in several technical fields simultaneously. Klas Eklund's reflection in this area suggest a focus on competence areas where Sweden already holds a prominent position; forest industry, system solutions, communication, green technology, urbanisation etc. More than this increased focus of certain activities, there will also be a need for more flexibility with an ability to quickly convert and readjust the scope of industries and operations in order to meet the new challenges that will arise due to extreme technological development and an increasingly dynamic world.

From what is seen in the Indian example, availability of a well-educated workforce is crucial for the attractiveness of a nation for the localisation of R&D. If Sweden wants to stay in a frontline position in this field the answer is therefore simple - make high tech educations more attractive for prospective students and increase the numbers of technical graduates. Fredrik Jejdling mention that he sees potential for improvement in this field as higher education in Sweden needs to be more targeted towards creation of technical knowledge and skills that makes the students employable for maintenance of the technological edge in the Swedish industry. One way to enhance the practical aspect of technical university education, is by enabling the development of more relevant skills and experience among graduates by increased interaction with the industry, for example through a larger focus and acknowledgement of internships during the study time. This would increase the practical experience and create stronger connections to the awaiting working life which in turn could stimulate the interest in technical education from prospective students. There are certainly many good aspects of Sweden's educational system, that provide a fundamental base for education of highly productive students which, in a general comparison, possesses great problem solving skills and capacity to work with high efficiency - qualities crucial to hold on to!

Fredrik Jejdling sees irrelevant educations as a large and increasing problem for Sweden's future. It is a touchy subject, but also deserves to be discussed within the limits of the thesis as it builds on the case companies' perspectives. There are many university graduates in Sweden that go unemployed since their education is not desired by any employer, a fact that is a bad deal for both the individual and the society at large because of the unused potential of the person. This is a hard subject to tackle, but somehow the relevance of the studies has to be ensured to secure Sweden's future competitiveness. A way of tackling the problem is that potential employers or companies advise the universities on the companies' needs for the future, to enable better matching between university course curriculum and industry's demand.

As a last advice, Sweden need initiatives to strengthen the technological hubs of the country, where universities, companies and the public sector collaborate with projects in a wide range of projects, highly appreciated by international companies.

### 7.3 Usability of the model of analysis

This thesis project is to a large extent built upon the model of analysis derived from the theoretical framework, meaning that the research questions, interviews and the following analysis and conclusions were constructed based on this framework. During the long work process the model of analysis has been revised once to better fit the purpose of the study by changing the part of analysis to more explicitly include the present and future R&D strategies of the companies. This has largely facilitated the usage of the model which, after the revision has been surprisingly accurate in capturing the factors from both a theoretical and an empirical perspective. This is quite clearly shown in the analysis where all factors identified in the model of analysis are used in some way. There are a few new factors found in the empirical chapter, of which most are closely related to already identified factors. Most notable is the driving force “Strategic location”, i.e. the strategic value of the physical location that the model didn’t capture. This should be included under driving forces, but is not considered influential enough to lead to an overhaul of the whole model. As much of the theory fit the empirical results quite well, the text can be seen as a little repetitive. This fact is also enhanced by the fact that a few of the factors are present in a similar manner in both “Driving forces” and “Desired outcomes”. This is a conscious decision, since it would be very hard to encompass the different dimensions of the factors in better ways.

As the factors in most cases were mentioned by the case companies, the interesting parts are rather the importance the case companies place on the different factors that clearly show which ones are considered important and which are of secondary importance when making decisions. Some critique against the model is that it does not try to rank the factors in any way, but that is rather seen as an advantage for the analysis since it gives more analytical freedom but at the cost of more easily proving or disproving the model. Also, if there would have been a ranking system, it would have taken the thesis closer towards a quantitative study, which here was avoided in order to focus on more qualitative insights.

The fact that the theories quite well match the empirical data prove that there is already a lot of accurate theories regarding why companies globalise and what they look for when it comes to establishment. These factors seem to rapidly change though, and also differ in importance between different industries, why it is important to keep the understanding of these kinds of factors up to date.

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## Interviews

Organisation	Name	Position	Starting year	Nationality	Date of inter
Ericsson	Ajay Gupta	Head of Strategy and Marketing, Gurgaon	2010	Indian	2012-10-22
Ericsson	Anil Trehan	Head of Proj.off, Global India service centre	1998	Indian	2012-10-30
Ericsson	Aniruddho Basu	Head of Portfolio for Site Solutions	2003	Indian	2012-08-31
Ericsson	Chandramouli Sargor	CTO for BUN, Bangalore	2004	Indian	2012-11-07
Ericsson	Eva Fredriksson	VP, Global Business Management APAC	2001	Swedish	2012-08-31
Ericsson	Hedwig Baars	CTO of Vimpelcom, Ericsson	1986	Dutch	2012-10-19
Ericsson	Raghavendra Chauhan	Prod. Man for Mediation Devices	1999	Indian	2012-10-30
Ericsson	Sachin Desai	Head of operations BUN, Bangalore	2004	Indian	2012-11-07
Ericsson	Fredrik Jejdling	Regional Manager, Ericsson India	2006	Swedish	2012-11-16
SCCI	Cecilia Rahm	General Manager	2011	Swedish	2012-11-19
SEB	Klas Eklund	Senior Economist		Swedish	2012-11-01
SKF	Arun Shivaram	Manager, Global Technological Centre	2010	Indian	2012-11-06
Growth Analysis	Andreas Muranyi Scheutz	Science & Technology Counsellor	2010	Swedish	2012-08-21
STCI	Aravind Venkatesh	Project Manager	2007	Indian	2012-11-07
Volvo	Edwin Paulraj	Head of R&D Chassi & Vehicle dynamics	1998	Indian	2012-11-08
Volvo	Håkan Berglund	Director, Adv. Tech. & Research Bangalore	2003	Swedish	2012-11-20
Volvo	Mats Rosenquist	Head of Advanced Tech. and research, SH	1992	Swedish	2012-08-27
Volvo	Olivier Jacquier	Site manager, Bangalore	2001	French	2012-11-08
Volvo	Sudeep Nakhe	Team member, Adv. Tech. & Research	2010	Indian	2012-11-05

# Appendix

## 1. Interview guide

### Introduction to our thesis work

- Who we are
- Our purpose of the study
- Our thesis work this far
- Our supervisor/stakeholder
- The role of the case companies

### About them:

- Elaborate about the function of your business unit and your role in the company
- Personal history in the company
- Do you have any relevant information about your company's activities in India that you could provide us?

### Questions

- **Elaborate about the R&D performed in the country**
  - What kind of R&D is performed in your facilities in India? (basic/advanced etc.)
  - What are the target markets for the R&D performed in India? (local/global)
  - What characterises the Indian-specific strategies for R&D and what are the future prospects?
- **How would you describe the general approach to R&D strategies from a local to a global level in the company?**
  - How do the Indian R&D activities relate to the global R&D strategies?
  - How integrated are the R&D activities across business units in the company?
- **What is the company's view on the changing market conditions in the world?**
  - What are the consequences on the international localisation of R&D?
- **On a general level, what would you consider have been the main driving forces for/against international localisation of R&D units in your company?**
  - Have you detected any trends among companies in the industry?
  - In localisation of R&D, what crucial resources have had an impact on the decision?
  - Which impact did strategies concerning value chains and internal organisation have on the localisation of R&D?
  - Which impact did market conditions and demands have on the decision?
  - Are these reasons still valid for the evolution of future R&D activities?

- **Why do you believe your company performs R&D in India?**
  - What are the main competitive advantages from having R&D in India from an internal point of view?
  - What is the main market related benefits having R&D located in India?
  - Have you noticed any changes for these factors?
  - What kind of R&D activities do you see your company perform in India in the future and why?
  - **Why is the company R&D located in the current locations in India?**
- **What is your assessment of the Indian business climate?**
  - What do you think complicates for foreign investment in R&D?
  - What do you think attract and facilitate FDI to India (Generally / R&D)?
  - Are there any industry specific benefits for your company for having R&D in India?
  - What capabilities inside your company facilitate or complicate the R&D activities in India?
  - What would make India being an even more attractive location for your company's R&D activities?
- **In comparison to other countries, how attractive is India for location of your company's R&D activities in a long term perspective?**
  - How is Sweden in this comparison? (To ask respondents with a relation to Sweden)

## 2. Klas Eklund on the future of Swedish jobs

*During the Nobel Memorial Week organised by the Swedish Embassy in New Delhi we got the chance to meet Klas Eklund, prominent Swedish economist working for SEB and the Swedish government. This chapter includes his reflections over the future prospects of Swedish companies' activities and competitive advantages in India and on a general global scale.*

From a historical point of view, Sweden has a tradition of giving birth to high technology companies which, over the years, have expanded to large multinational corporations with prominent positions on their respective markets. With increasing levels of education and technical competence in emerging and developing countries such as China and India, Sweden has to work harder in order to hold on to existing and develop new competitive advantages. Rather than living on prosperity as a nation on the front line for innovation and technical competence, there is a need for adaptation to globalized value chains and a disseminated production process.

The border between products and services is fading away and industrial processes are present in traditionally service-focused areas and vice versa. Activities will, to a higher extent be possible to locate on widespread locations rather based on factors as access to resources and competence than geographical closeness. Even in sectors with a prior strong local connection, like provision of health care services, trends concerning outplacements of labour and workplace facilities are rising. In the near future it is not unlikely that patients travel to a higher extent to distant, even foreign locations for attain access to health care services. Another example is doctors conducting operations over long distances helped by technological communication solutions. In order to stay competitive in such a society where technological advancements opens up for increased global competition, there is an increased need for flexibility and ability to leverage from innovative ideas. Sweden needs to create opportunities for companies to stay on the front edge with solutions enabling adaptation to ever-changing demands and competitive solutions.

The Swedish society does here need to provide domestic and foreign companies with a favourable business climate which gives incitement to locate operations in the country. Location of high value adding activities in the country does on one side generate employment opportunities but also incomes from taxation in those cases the headquarters are located in the country. Support to enhance the level of education, knowledge and value creation in focus on the political agenda and financial and legal support to small and large corporations are among interventions that can encourage investment in and localisation of value adding activities in Sweden. More attention should be focused on innovative activities and initiatives and the existing public support needs to be distributed to a wider scope of activities than what is the case today. However, in order to create sustainable and globally competitive companies and solutions, Sweden should leverage from existing prominent sectors such as the forestry industry, system solutions and processes, urbanisation, safety and cleantech. These are also many areas which for which there are opportunities to increase market shares in emerging economies as China and India.