Interacting with Foreign Industrial Clusters

- A Case Study of Swedish Companies in Japanese Clusters

August Asplund
Oscar Walde

June 3, 2021

This master thesis for the degree of Master of Science in Industrial Engineering and Management has been conducted at the Department of Industrial Management & Logistics, the Division of Production Management at the Faculty of Engineering LTH, Lund University. Supervisor at LU-LTH: Asst. Prof. Ola Alexanderson; Examiner at LU-LTH: Prof. Johan Marklund.

Thesis for the degree of Master of Science in Industrial Engineering and Management

Division of Production Management
Department of Industrial Management & Logistics
Faculty of Engineering LTH – Lund University
Naturvetarvägen 18
Box 118, SE-221 00 Lund, Sweden
www.pm.lth.se

Abstract

Clusters, agglomerations of companies in related industries, are a phenomenon which have been widely accepted to increase the productivity of its constituent companies. Many scholars hold the view that companies should utilise these favourable conditions and interact with clusters. Nevertheless, there exists limited literature on the topic *how* companies can interact with clusters outside of their home base. Thus, the purpose of the study is to identify and explore what methods companies can utilise to interact with clusters outside of their home base and why they choose a certain strategy, by focusing on what interaction strategies Swedish companies have utilised to interact with Japanese clusters. This is addressed through a case study with seven Swedish companies that interacts with Japanese clusters.

The study finds that there are two categories of interaction modes, co-location modes and remote modes. Co-location modes include establishing a subsidiary, joint venture, and integrated or independent acquisition. Remote modes include distributors, technology scouting and inter-cluster networking. An additional mode is interaction through an accelerator or an incubator which can be both a co-location mode and a remote mode. Unlike previous entry mode categorisations, the taxonomy presented here is specifically suited for cluster interaction and includes non-transactional modes.

Furthermore, the interaction strategy, which is a combination of the interaction mode and the activities allocated to the cluster, is found to be affected by the three factors: the motives for cluster interaction, the company's characteristics and the cluster's characteristics. The study shows that Swedish companies most commonly establish a subsidiary to interact with Japanese clusters, but that there are also examples of integrated acquisitions and remote interaction modes. Most companies have sales and supporting functions but there are also cases with R&D and production allocated to the cluster.

Keywords: Industry Cluster, Cluster Strategy, Interaction Strategy, Tap into, Sweden, Japan, Internationalisation

Acknowledgements

This master thesis project was conducted during the spring semester of 2021 by August Asplund and Oscar Walde. The project consists of 30 credits and finalises five years of education within Industrial Engineering and Management at the Faculty of Engineering at Lund University.

We would first and foremost like to thank our supervisor Ola Alexanderson, at the division of Production Management at the Faculty of Engineering, for the great support we have received. He has been engaged in the project from the very beginning and provided us with valuable insights and challenging discussions. Thank you for being flexible, helpful and accommodating when sudden changes have occurred throughout the project.

Moreover, we would like to show our greatest appreciation to all the interviewees who has devoted their time to share their knowledge with us. Without your input, the project would not have been possible to realise. We would also like to thank Michael Jacob, Innovation and Science Counsellor at the Embassy of Sweden in Tokyo, for your ideas and guidance in the planning stage of the project. We would like to send regards to Martin Koos, Executive Director at the Swedish Chamber of Commerce and Industry in Japan, and Niklas Karvonen, Community Director at Nordic Innovation House in Tokyo, for helping us to find interesting companies to the data collection. We would also like to express our gratitude to Keio University, and especially to Professor Chie Iguchi, for accepting us to Keio University's thesis program. We are sad that we never got the opportunity to visit and collaborate with you.

Finally, we would like to give our thanks to our sponsors: *The Scholarship Foundation for Studies of Japanese Society* and *Carl Erik Levin Foundation*. Thank you for showing interest in the project.

Thank you!

August Asplund
Lund, June 2021

Oscar Walde
Lund, June 2021

Executive summary

Title

Interacting with Foreign Industrial Clusters - A Case Study of Swedish Companies in Japanese Clusters

Authors

August Asplund and Oscar Walde

Supervisor

Ola Alexanderson

Background

Through mechanisms such as shared inputs and resources, knowledge spill-overs and synergies, industrial clusters create favourable conditions for efficiency gains and innovation. Many scholars hold the view that companies should utilise these favourable conditions and interact with clusters. Sweden and Japan are ranked among the top 20 most innovative countries in the world, and they share industrial specialisations including vehicles, machinery, electrical machinery and medical equipment. As such, it is natural for Swedish companies to consider how they can benefit from Japanese clusters.

Purpose

The purpose of this thesis is to identify and explore the methods companies use to interact with clusters outside of their home base, what their motives for interacting are and why they choose a certain interaction strategy.

Research Questions

RQ1: What methods can companies utilise to interact with clusters outside of their home base?

RQ2: What interaction strategies have Swedish companies utilised to interact with Japanese clusters?

RQ3: What factors affect the strategy choice among Swedish companies interacting with clusters in Japan?

Method

This research has an explorative purpose and is conducted using an abductive and qualitative approach. The project includes a case study with seven Swedish companies which are interacting with Japanese clusters.

Delimitations

This thesis takes a managerial perspective on companies with home base in Sweden, which have established some sort of relationship with a cluster because of benefits tied specifically to that location. The object of study is not the cluster itself, but the company and its strategic decisions to relate to a specific cluster.

Conclusions

Companies can interact with a cluster through co-location modes or remote modes. Co-location mode includes subsidiary, joint venture, integrated and independent acquisitions while remote mode includes distributors, technology scouting and accelerator or incubator. It has been identified that Swedish companies most commonly establish a subsidiary to interact with Japanese clusters. Most companies have sales and supporting functions but there are cases with R&D and production allocated to the cluster. A company's interaction strategy choice is affected by the three factors: motives for cluster interaction, company characteristics and cluster characteristics.

Keywords

Industry Cluster, Cluster Strategy, Interaction Strategy, Tap into, Sweden, Japan, Internationalisation

List of Figures

List of Tables

List of Abbreviations

APAC	Asia Pacific
DACH	Germany (D), Austria (A) and Switzerland (CH)
FDI	Foreign Direct Investment
METI	Ministry of Economy, Trade and Industry
MEXT	Ministry of Education, Culture, Sports, Science and Technology
MNE	Multinational Enterprise
OEM	Original Equipment Manufacturer
R&D	Research & Development
WOS	Wholly Owned Subsidiary

Contents

1 Introduction

This section is introduced with a background to the subject, followed by a description of how the problem under study was discovered and why it is important. Subsequently, the purpose of the thesis is presented and concretised in three research questions, and delimitations to the study are discussed. Finally, a brief outline of the thesis is presented.

1.1 Background

Clusters, agglomerations of companies in related industries, are a phenomenon which have been widely accepted to increase the productivity of its constituent companies (Dicken, 2015; Harvard Business School, no date). Through mechanism such as shared inputs and resources, knowledge spill-overs and synergies, clusters create favourable conditions for efficiency gains and innovation (Porter, 1990; McCann, 2008).

While some scholars emphasise the importance of concentrating a company's most crucial activities to a home base with favourable cluster mechanisms, others have proposed that multinationals should organise as a network which combines remote resources to unlock new factors of competitiveness (Sölvell and Zander, 1995). Despite their differences, these views share the idea that companies should utilise or "tap into" favourable local conditions around the globe. Many companies seem to be listening, and instead of concentrating their most important activities to the home base spreading them across locations. For example, European multinationals almost doubled the share of R&D spent abroad between 1995 and 2004 (McKinsey Global Institute, 2017).

Swedish companies' competitiveness depend on improved efficiency, adaptability and innovative ability (Bennet, 2015). With a relatively modest home market and resource pool, it would seem natural that they are especially dependent on utilising foreign resources and learning from foreign industry. This seems to be happening, as Swedish companies have increased their headcount in foreign subsidiaries with over 65% between 2000 and 2018 (Holmström, 2020).

Both Sweden and Japan rank among the 20 most innovative countries in the world and boast city regions with among the largest scientific output, e.g. Tokyo-Yokohama (1st), Osaka-Kobe-Kyoto (6st), Stockholm (33rd) and Malmö-Lund (96st) (Dutta, Lanvin and Wunsch-Vincent, 2020). The economies also share many industrial specialisations, including vehicles, machinery, electrical machinery and medical equipment (World's Top Exports, 2020, 2021). As such, it is natural for Swedish companies to consider how they can benefit from Japanese clusters.

1.2 Problem Discussion

The inspiration for this project was the Toyota initiative Woven City, which one of the authors encountered while working for the Office of Science and Innovation at the Swedish Embassy in Tokyo. Woven City is an effort from Toyota to initiate a cluster of companies related to mobility

solutions, sustainable energy, and modern city planning. The Office of Science and Innovation wanted to map the technological domains included in Woven City and investigate how this matched the capabilities of Swedish companies, in order to examine their inclusion in the project.

A natural extension of this question is how companies can take advantage of Woven City, or other clusters in general. The most common motive for internationalisation is to gain access to foreign markets (Dicken, 2015) and therefore, this phenomenon has been far more researched than companies trying to draw other advantages (Asmussen, Benito and Petersen, 2009). The existing literature also focuses primarily on companies that establish a physical presence abroad, e.g. through an acquisition or subsidiary, and evaluate the entry mode choice based on a small set of variables, e.g. firm size. As no company can possibly establish a presence in every cluster, and each company must take many factors into consideration, the question of how to relate to or interact with clusters outside the home base in general remains largely unaddressed by existing literature. This thesis will attempt to shed some light, and take a more holistic view, on this issue.

1.3 Purpose

The purpose of this thesis is to identify and explore the methods companies use to interact with clusters outside of their home base, what their motives for interacting are and why they choose a certain interaction strategy.

1.4 Research Questions

The purpose will be fulfilled by answering the following three research questions.

RQ 1: What methods can companies utilise to interact with clusters outside of their home base?

RQ 2: What interaction strategies have Swedish companies utilised to interact with Japanese clusters?

RQ 3: What factors affect the strategy choice among Swedish companies interacting with clusters in Japan?

1.5 Delimitations

This thesis takes a managerial perspective on companies with home base (or de facto home base) in Sweden. Specifically, cases are of interest where companies have established some sort of relationship with a cluster because it is a cluster, or because of benefits tied specifically to that location. This includes companies whose target customers are concentrated in a cluster.

This thesis does not treat cases where companies have happened to establish in a cluster with motivations that are not tied to the specific location. Examples of this are internationalisation efforts with the sole purpose of targeting new markets, or international establishment due to political reasons. This thesis does not take the perspective of governments trying to promote

economic activity and attract investment, nor of industry organisations trying to build local or global networks. The object of study is not the cluster, but rather the company and its strategic decisions. Finally, the research questions do not consider *which* cluster a company chose to relate to or how that choice is made. Rather, it assumes that the company in question has identified a specific cluster and is considering *how* to interact with it.

1.6 Disposition of Report

Chapter 1 – Introduction
The first chapter will include background information about the thesis' subject to serve as an introduction. The chapter will also cover how the authors encountered the topic and why this study is necessary. Moreover, the research questions as well as the report's delimitations will be presented. At the end, a brief outline of the report's chapters will be presented to provide an overview of the report's structure.

Chapter 2 – Method
The second chapter will describe and motivate what methodological choices the thesis has taken. It will also provide a thorough description of the case selection and how this fits the purpose of the report. Finally, this section will include a discussion about what measures have been taken to increase the credibility and methodological quality of the report.

Chapter 3 – Theory
The third chapter will provide the theoretical framework of cluster theory which this thesis is built upon. It will also include theory on why companies interact with clusters and what affects their strategy choices. At the end of the chapter a model for cluster interaction strategy choice is presented, based on the theory.

Chapter 4 – Setting the Context: Japan
The fourth chapter will cover contextual factors of Japan on a societal level and thus, separated from the theoretical framework. A comparison between Swedish and Japanese culture will also be provided to highlight differences and similarities.

Chapter 5 – Empirics
The fifth chapter will present the information gathered from interviews with the seven case companies, as well as some information collected in exploratory interviews. Most of the presented information was provided by the interviewees but secondary sources are also used to serve as a compliment and create a more robust foundation for further analysis. The chapter ends with summarising tables of the results.

Chapter 6 – Analysis
The sixth chapter will analyse the empirics and includes two analysis methods. The first method is a cross-case analysis where the cases will be compared, and the second method is a cross-case synthesis in order to find how the parameters in the "Interaction Strategy Choice Model" relate to each other.

Chapter 7 - Discussion

The seventh chapter will discuss the results of the thesis to answer the research questions and reach a conclusion.

Chapter 8 – Conclusions

The eighth chapter will present answers to the research questions. It will also process the practical and academic implications of this thesis. Lastly, this chapter will evaluate the credibility of the research as well as suggest areas for further research within the field.

2 Method

In this section, the research purpose, scientific method and research method are presented and motivated. After defining the basic building blocks of the method, the research design is described at depth and the quality of the chosen method is discussed.

2.1 Research Purpose

Suitable method choice depends on the research purpose, which can be divided into the four categories descriptive, exploratory, explanatory and problem solving (Höst, Regnell and Runeson, 2006). The first three categories aim for a gradually deeper understanding of a phenomenon, where descriptive research describes how something happens at a basic level, exploratory research describe the phenomenon at a deeper level, and explanatory research provides causational explanations to why something happens (Höst, Regnell and Runeson, 2006). Both descriptive and exploratory methods are used when the phenomenon at hand has yet to be defined by existing research (Sheppard, 2020).

The concept of interacting with clusters is not completely ignored in international management literature, but as described in section 1.2, a comprehensive view on the available interaction methods and affecting variables is lacking. Therefore, the purpose of this thesis is to define the problem and its moving parts, and to distinguish patterns. The aim is to get a deeper understanding of what factors affect the interaction mode, but not to reach causal conclusions. Therefore, the research purpose of this thesis is explorative.

2.2 Scientific Method

2.2.1 Inductive, Deductive and Abductive Research

There are three different ways of logical reasoning when conducting a research and these are inductive, deductive and abductive approaches (Boell and Hovorka, 2019). Inductive reasoning is built on the idea that one can construct scientific knowledge by observing the object of interest (Dresch, Pacheco Lacerda and Valle Antunes Jr, 2014). On the other hand, deductive reasoning is based on available theory which is used to form hypotheses to predict the behaviour of the studied object (Dresch, Pacheco Lacerda and Valle Antunes Jr, 2014). The deductive approach is characterised by the use of logic while the inductive approach is based on observation (Dresch, Pacheco Lacerda and Valle Antunes Jr, 2014). Moreover, the abductive reasoning is a combination of the inductive and deductive approach where the researcher iterates and moves back and forth between theory and data (Saunders, Lewis and Thornhill, 2009).

There is extensive research within the field of economic geography and benefits of participating in an industrial cluster. Nevertheless, the more detailed theory regarding industrial clusters and how companies can interact with them is limited and therefore, an abductive approach will be used

to conduct this research. The authors of this report identified the need to iterate the model throughout the project to combine existing literature with findings from empirics.

2.2.2 Qualitative and Quantitative Approach

According to Höst, Regnell and Runeson (2006), empirical data can either be of quantitative or qualitative character. Quantitative data is commonly numerical, often gathered from questionnaires, and is analysed by statistical and numerical analyses, while qualitative data is non-numerical data and can consist of more in-depth, and nuanced descriptions from interviews or observations (Höst, Regnell and Runeson, 2006; Saunders, Lewis and Thornhill, 2009). In practice, it is common to use a mix of these two data types as it can be beneficial to complement the quantitative data with more qualitative data and vice versa (Saunders, Lewis and Thornhill, 2009).

As the theoretical foundation of how companies can interact with industrial clusters is limited, it is difficult to gather numerical data. This, combined with the explorative character of the project, supports that qualitative data should be gathered for this report. Additionally, a qualitative approach will provide a wider view on the topic and reduce the risk of oversee interesting variables (Saunders, Lewis and Thornhill, 2009).

2.3 Research Method

Four of the most prominent research methods in management literature are case study, action research, survey and modelling (Dresch, Pacheco Lacerda and Valle Antunes Jr, 2014). Case studies describe one or multiple specific cases at depth, often using multiple data sources (Höst, Regnell and Runeson, 2006). Action research aims to solve a problem in the studied organisation by interacting with the object of study, e.g. by implementing a change in the organisation's way of working (Dresch, Pacheco Lacerda and Valle Antunes Jr, 2014). Surveys are a form of data gathering which can be especially useful when questions are precise and require little adaptation depending on the given answers (Höst, Regnell and Runeson, 2006). Finally, modelling builds on creating simplified representations of the studied object, and is a method suitable for developing better understanding of how variables affect each other (Dresch, Pacheco Lacerda and Valle Antunes Jr, 2014).

According to Yin (2014), case studies are suitable for gaining a comprehensive, detailed and realistic understanding of complex phenomenon. Yin (2014) also argues that case studies are suitable when the research question is of the type "how" and why", control over events is not possible and focus is on contemporary (as opposed to historical) events. According to Dresch et. al. (2014), case studies are inherently inductive, in the sense that they start in empirics with the ambition to formulate theory. With these arguments in mind, the author's find that a case study is a suitable research method for the purposes of this thesis. However, as mentioned previously, the scientific method is abductive, starting in theory to formulate the case study, which then provided the input to improve the models formulated by theory. In the remainder of this chapter, Yin's "Case study research: design and methods" (2014) will be heavily cited as guidance for how to conduct case studies. This work by Yin is considered the most influential text on case study research and has been cited over 100 000 times (Massaro, Dumay and Bagnoli, 2019).

Commonly expressed criticism of case studies as a methodology include lack of rigor and generalisable results (Yin, 2012). The first concern can be managed primarily by carefully constructing and following a research design. The research design will be further described in section 2.4. Secondly, generalisable results are indeed not obtainable from case studies. However, conclusions can be reached which can be analytically transferable to other cases, thus fulfilling the purpose of describing and understanding managerial decisions.

2.4 Research Design

The research design is a plan of the sequential steps to be taken to fulfil the purpose of the study. It should describe and motivate the chosen steps, all the way from theory development to final conclusions (Dresch, Pacheco Lacerda and Valle Antunes Jr, 2014). The research design of this thesis is divided into four main stages: Theory Development, Case Study, Analysis and Discussion. In Table 2.1 below, the significant activities and outcomes of each stage are presented. Each stage of the research design is elaborated upon in the following subsections.

Table 2.1: A schematic illustration of the four stages of the thesis, and the significant activities and outcomes of each phase.

Stage	Activity	Outcome
Theory Development	Literature Review, Cluster Strategy Exploratory Interviews Literature Review, Japanese Industry	Key Concepts Related to Cluster Interaction, Interaction Strategy Choice Model Theory Reality-Check Japanese Clusters and Corporate Structures
Case Study	Interviews with Industry and Government Organisations Pilot Study Interviews Secondary Research	Case Selection Finalised Interview Guide Individual Case Reports
Analysis	Cross-Case Analysis Cross-Case Synthesis	Description of Interaction Strategy Choices, Identification of Important Factors Effects of Interaction Motives, Company and Cluster Characteristics
Discussion		Quality of Results Summary of Findings Proposals of Future Research

2.4.1 Theory Development

For case studies, theory development is an important part of the research design, as it helps to formulate the right questions and define the unit under analysis (Yin, 2012). The theory was divided into three basic building blocks: theory describing the concept of clusters and how they create competitive advantages for companies in them, theory describing interactions with clusters outside of the home base, including related theory on market entry, and theory on the Japanese context. The purpose of the Theory Development stage was to establish what forms an interaction strategy can take and factors that can affect a company's decision on what strategy to choose.

Section 3.1 describes how theory on clusters has developed over time, and how clusters are perceived and categorised today. Section 3.2 describes a well-known model of how companies gain competitive advantages by acting in a cluster, Porter's Diamond. Section 3.3 reviews existing literature on the motives and strategies for interacting with a cluster, and how the company's own characteristics affect their choices. Where research on cluster interaction was lacking, parallels were drawn to market entry theory, which is more developed. Section 3.4 proposes a model of interaction strategy choice is based on the existing literature. Finally, in section 4, Japan's cluster geography and contextual factors which may affect cluster interaction are described.

In this stage of the research, exploratory interviews were conducted in order to provide input to the Theory Development. The interview objects were people with experience of similar decisions in a different context (typically in proximity to Lund University), which allowed the authors to test the real-world validity of theory without having to fully establish relevant cases. An overview of the exploratory interviews is presented in Table 2.2.

Table 2.2: Overview of the exploratory interviews.

Interviewee	Company	Position	Date	Duration
Bengt Lindoff	Ericsson, Huawei	Former Researcher, Researcher	2021-02-10	45 min
Christina Wanscher	Odense Robotics	Network Manager	2021-02-11	30 min
Mats Lindoff	Sony Ericsson ENEA	Former CTO, Board Member	2021-02-16	30 min

2.4.2 Case Study

Case Selection

A single case study is preferred when one case has a unique property or is of critical importance, while multi case studies are typically considered more robust and compelling (Yin, 2012). As no particular case was considered especially important or representative, a multiple case approach was deemed appropriate for this thesis.

In the Theory Development stage, two branches of interaction modes were identified, remote and co-location modes. In other words, companies can either relate to a cluster by establishing presence in the cluster (e.g. through an acquisition) or have a more remote relationship (e.g. using a distributor). As the research purpose was not limited to any of these branches, efforts were made to find cases of both types.

As there are no register over Swedish companies with ties to Japanese clusters, the size or composition of the target population could not be precisely described. However, around 150 Swedish companies have a presence in Japan (Business Sweden, no date) and most internationalisation has purely market seeking intentions (Dicken, 2015), so the population of companies employing co-location strategies is likely limited. It is virtually impossible to say anything about the population of companies employing remote strategies, other than that they likely belong to industries in which Japanese companies are prominent. These factors were kept in mind when identifying and choosing cases.

Cases of companies employing remote strategies were identified with the help of three Swedish industry organisations. Organisations which represented industries prominent in both Sweden and Japan were chosen. As smaller companies likely have less resources to employ co-location strategies, organisations with many SMEs among its members were favoured in order to increase the chances of finding remote strategy cases. The industry organisations and identified cases are presented in Table 2.3.

Table 2.3: Industry organisations utilised to identify remote strategy cases.

Industry Organisation	Industry	Contact Person	Identified Cases
Swedish Games Industry	Video Game Development and Distribution	Anton Albiin	Thunderful Games
The Scandinavian Automotive Supplier Association (FKG)	Suppliers and Customers to Automotive Industry	Gabriella Vidarson	Ekkono
PhotonicSweden	Optics and Photonics	Lennart Svensson	No cases identified

In a similar fashion, cases of companies with an established presence in Japanese clusters were identified with the help of government agencies and the Swedish Chamber of Commerce in Japan, as presented in Table 2.4. In discussions with each organisation, the main challenge was to distinguish which companies had established in Japan at least in part due to proximity to a cluster. When possible, secondary research was used to establish the relevance of the cases before contacting the identified companies.

Table 2.4: Government organisations used to identify co-location strategy cases.

Organisation	Contact Person	Identified Cases
Swedish Chamber of Commerce in Japan	Martin Koos	SECO Tools, AstraZeneca, Mycronic, Autoliv, ABB Robotics, Sandvik Coromant
Nordic Innovation House	Niklas Karvonen	CELLINK
EU-Japan Centre for Industrial Cooperation	Luca Escoffier	No cases identified

Another approach to find co-location cases was to examine the member lists of Japanese industry organisations representing industries that are prominent in both Sweden and Japan. The rationale was that Swedish companies establishing in Japanese clusters would be more likely to join this type of organisation in order to interact with local companies. The industry organisations and identified cases are presented in Table 2.5.

Table 2.5: Industry organisations used to identify co-location strategy cases.

Industry Organisation	Industry	Identified Cases
Japanese Association of Robotics and Automation (JARA)	Robotics and Automation	Piab
Photonic Valley	Optics and Photonics	No cases identified
Medical Technology Association of Japan	Medical Technology	No cases identified

Japanese companies that had been acquired by Swedish companies were usually not members of the Swedish Chamber of Commerce, nor could they be identified in industry organisation member lists. In order to capture this group of cases, the M&A database Zephyr was utilised. Using the following four filters generated 19 hits, which after closer inspection constituted 15 distinct inter-company relationships.

- **Deal Type:** Acquisition, Merger, Minority Stake, Joint Venture
- **Deal Status:** Completed
- **Target Geography:** Japan
- **Acquiror Geography:** Sweden

By consulting press releases and annual reports from the acquiror, two cases were identified that seemed to be partially driven by the need to access specific capabilities and conditions of the Japanese market. The identified acquisition objects are presented in Table 2.6.

Table 2.6: Swedish acquisitions of Japanese companies identified as possible co-location cases

Acquiror	Target	Type
AAK	Miyoshi Oil & Fat Co.	Joint Venture
Volvo	Nissan Diesel Motor Co. (now UD Trucks)	Acquisition

The authors made serious efforts to contact all companies mentioned above in order to confirm the relevance of the case. After excluding irrelevant cases and companies who did not respond or did not want to participate, the remaining cases are as presented in Table 2.7 and Figure 2.1 below.

Identification of suitable cases proved quite difficult for two main reasons. Firstly, establishment in foreign clusters with the sole purpose of drawing location dependent advantages from the cluster was rare, as most cases also included some form of market seeking motives which were not always tied to a specific location. Therefore, it was sometimes difficult to distinguish, before talking to a knowledgeable representative from the company, whether a case was relevant. Secondly, the terms and concepts used in this thesis are not always used consciously, or in the same way, by practitioners. This made it difficult to express effectively what a suitable case was, especially in written form. Because of these challenges, cases were selected largely based on availability and relevance to the research questions.

Table 2.7: Presentation of the selected case companies.

Company	Industry	Target Geography	Mode
Axis Communications*	Print Servers	Spread out (Based in Tokyo)	Co-location
Piab	Manufacturing Automation	Spread out (Based in Tokyo)	Co-location
Ekkono	Machine Learning Software	Tokyo	Remote
CELLINK	Bioprinting	Kyoto	Co-location
Seco Tools	Machine Tools	Nagoya	Co-location
Mycronic	Electronics Manufacturing	Fukuoka	Co-location
Autoliv	Automotive Safety	Tsukuba	Co-location
Sandvik Coromant	Machine Tools	Nagoya	Co-location

*Pilot study

Figure 2.1: The case companies and their target geographies.

Interview Guide and Case Report

In order to improve the reliability of a case study, Yin (2014) suggests that an interview guide should be prepared before interviews are held. In addition to improving reliability of results, carefully structuring the interview beforehand helps the researcher assure that the information collected is sufficient to fulfil the purpose of the study. The interview guide used for the case study is included as Appendix A.

In the same stage, a structure for the individual case reports was prepared in order to visualise the intended outcome of each case study. This framework is presented in Appendix B.

Pilot Study

In order to verify that the interview guide is sufficiently comprehensive to answer the research questions, and identify potential gaps, it is recommended to conduct a pilot study (Yin, 2012). Towards the end of the Theory Development stage, the authors came across what seemed to be a suitable case for the study, Axis Communications' entry to the Japanese market. Together with the timing of this first contact, this case was chosen as a pilot study.

The study was carried out in the form of a video call with Per Björkdahl (Business Development Director) and Martin Gren (Co-Founder, Director New Projects), after an initial interview with Per Björkdahl to introduce the subject.

Case Studies

The case studies were based on data collected primarily through interviews, with supporting and controlling evidence from secondary sources. All interviews were held by video conference and

are presented in Table 2.8. Yin (2014) argues that interviews are among the most important sources of information for a case study, as they are suitable for the "how" and "why" questions that the case study is meant to answer. In accordance with what Yin (2014) proposes, the interviews had a conversational tone, but rarely ventured far from the interview guide presented in Appendix A due to the limited time available in most discussions. In other words, the interviews were semi-structured. Where necessary and possible, multiple interviews were held within the same case, in order to capture different perspectives. Throughout the interviews, one of the authors was responsible for the line of questioning while the other took notes, in an attempt to ensure that information was properly relayed. The interviews were recorded which helped to validate that the notes were correct. In the event that questions remained unanswered, or the authors perceived logical gaps, this was either followed up with the interviewee or corrected by consulting interview recordings.

Table 2.8: Overview of case study interviews.

Company	Interviewee	Position	Date	Duration
Piab	Kazuyuki Yoshie	Representative Director of Piab Japan	2021-04-05	45 minutes
	Josef Karbassi	President of the Vacuum Automation Division of Piab AB	2021-04-06	60 minutes
Ekkono	Jon Lindén	Chief Executive Officer	2021-04-07	50 minutes
CELLINK	Tomoko Bylund	Sales Director of the APAC Region	2021-04-08	75 minutes
SECO Tools	Sammy Tsuruhisa	Managing Director of Seco Tools Japan	2021-04-13	105 minutes
Mycronic	Per Dahlberg	M&A Integration Manager	2021-04-16	70 minutes
Autoliv	*	Key Executive based in Tsukuba	2021-04-19	65 minutes
Sandvik Coromant	Masahiro Yamamoto	Country Manager Japan and General Manager APAC	2021-04-23	60 minutes

*The interviewee has asked to remain anonymous.

Yin (2014) also stresses that interviews are inherently prone to biases as the interviewer and interviewee will affect each other's thinking with their questions and answers. Yin (2014) proposes that secondary sources such as documentation should be used in order to corroborate important data points, and that special attention is given to issues where information from interviews and other sources do not align. For the purposes of this study, the main forms of secondary documentation were the companies' own websites, press releases and industry media outlets.

Finally, each case was summarised in individual reports according to the framework prepared earlier in this stage and presented in Appendix B. All case reports were reviewed by the interviewees in order to validate that the authors had not misinterpreted or misrepresented any information.

2.4.3 Analysis

After conducting the case studies, the third stage was analysis of results. Yin (2014) presents five different analytical methods suitable for case studies. For this study, cross-case analysis was judged most suitable because it does not require time series data or a theoretical framework with enough sophistication to produce precise predictions. The first step of the analysis was to summarise the individual reports, which was a way to fulfil the purely explorative purpose of the thesis, without explanatory ambition. Subsequently, the analytical technique which Yin (2014) refers to as cross-case synthesis was employed. Cases were partitioned according to variables that had been identified in the Theory Development and Case Study stages of the research. The subgroups thus formed were then analysed qualitatively in search of patterns and themes.

2.4.4 Discussion

In the discussion stage, the results and analysis were put in relation to the research questions and purpose. The quality and implications of the results was discussed, and suggestions for further research presented.

2.5 Quality of Research Design

This section will discuss how the research design described above affected the quality of the research, and what steps were taken to promote high quality research. The quality of research can be judged from its reliability, validity and representativeness (Höst, Regnell and Runeson, 2006). Reliability refers to the rigor of the data collection and analysis, validity refers to the ability to measure the intended object or variable under study, and representativeness judges to what degree results from the research can be generalised. Specifically for case studies, Yin (2014) proposes that validity should be divided into construct and internal validity, and calls representativeness external validity. In this section, Yin's two validity concepts will be discussed, but Höst et. al.'s name representativeness will be used.

Reliability in case studies means that biases and errors should be avoided, so that another researcher conducting the same case study again would reach the same result (Yin, 2012). In order to allow for reproducibility, the interview guide has been included in the appendix of this paper. Detailed descriptions of how, when and with whom interviews were conducted have also been included.

Construct validity refers to how well the researcher manages to formulate operational constructs, without which they may revert to subjective measures (Yin, 2012). Some terms utilised in this thesis, e.g. "cluster type", "cluster lifecycle" and "interaction mode", are somewhat loosely defined constructs and as such pose a threat to the construct validity. To minimise this risk, concepts were defined as clearly as possible in the Theory Development stage, and multiple sources were used to corroborate information gathered in interviews, as proposed by Yin (2014). For example, if an interviewee described the target cluster as a certain type, this was corroborated against other descriptions of the cluster to make sure that this description was not completely subjective. All case reports were reviewed by the interviewees, which is another method for ensuring construct validity

proposed by Yin (2014). Internal validity is the ability of distinguishing causal from spurious explanations, and is therefore mainly a concern for explanatory and causal studies (Yin, 2012). Since this thesis mainly has a explorative purpose, internal validity if less of a concern, but in the Analysis stage all inferences were clearly described to illustrate how the authors reached the presented conclusions.

Representativeness expresses the degree to which the findings from a study can be transferred to other situations, and the scope of situations for which the findings are representable (Yin, 2014). One tactic for improving representativeness, described by Yin (2014), is to formulate research questions so that information is naturally gathered which allows for increased representativeness. This tactic includes asking "how" and "why" questions, which allow the author to judge whether observations are also transferable to other cases (Yin, 2014). This tactic has been taken into consideration when formulating the research questions and interview guide.

Another aspect of representativeness is how well the selected cases represent the phenomenon under study. The cases selected for this thesis have large variations in terms of industry, geography and motive for interacting with the target clusters. Japan's top four export industries are vehicles, machinery including computers, electrical machinery equipment and medical apparatus (World's Top Exports, 2021), while Sweden's top three export industries are machinery including computers, vehicles and electrical machinery equipment, with medical apparatus is placed in tenth place (World's Top Exports, 2020). In other words, the case companies cover all of the major industries which Sweden and Japan share. As multiple different methods were used and people were consulted in the case selection, it is likely that the identified cases constitute a substantial portion of the population of co-location cases. The representativeness of remote cases is not as strong, as these proved more difficult to identify. Overall, however, the cases are representative of the population under study and provide enough variation to make results analytically transferable to other situations.

3 Theory

This section begins with a description of how theory on clusters has developed over time, and how clusters are perceived and categorised today. Next, a well-known model of how companies gain competitive advantages by acting in a cluster, Porter's Diamond, is presented and discussed in relation to the research questions. Additionally, a review of existing literature on the motives and strategies for interacting with a cluster, and how the company's own characteristics affect their choices, is presented. Where research on cluster interaction was lacking, parallels is drawn to market entry theory, which is more developed. Finally, a model of interaction strategy choice is proposed based on the existing literature.

3.1 Clusters

3.1.1 The Development of Cluster Theory

Cluster theory can be traced to the work of the English economist Alfred Marshall in the late 19th century (Chiaroni and Chiesa, 2006; Ingstrup and Damgaard, 2013; Vicente, 2018). Based on observations in different parts of England, Marshall argued that co-located, small firms operating within the same industry could gain advantages in comparison to a single, large organisation with aggregated activities (Konzelmann, Fovargue-Davies and Wilkinson, 2018; Vicente, 2018). Marshall named the concentration of firms as industrial districts (Konzelmann, Fovargue-Davies and Wilkinson, 2018) and two of the districts he observed were the textile industry in Lancashire and cutlery industry in Sheffield (Vicente, 2018). He describes the industrial district as:

"The broadest and in some respects most efficient forms of cooperation are seen in a great industrial district where numerous specialized branches of industry have been welded almost automatically into an organic whole" (Marshall 1919, p. 599). (Vicente, 2018)

Among the benefits of the industrial districts, McCann (2008) highlights the proximity between the co-located firms as it facilitates face-to-face contact which could ease tacit knowledge sharing between firms. Tacit knowledge can be described as personalised knowledge which cannot be expressed in documents or communicated through formal mechanisms (Dicken, 2015). Moreover, industrial districts can benefit from improved access to specialised inputs due to a geographically concentrated demand, as well as an ability to attract specialised labour competences (McCann, 2008). In addition to the co-location and high concentration of firms in a cluster, Marshall describes what he calls an "Industrial atmosphere" which creates further advantages (Belussi and Caldari, 2009; Vicente, 2018).

Since Marshall's findings about industrial districts, there have been several approaches to analyse industrial clustering. One of the approaches is the Italian industrial districts which are like Marshall's industrial district with an emphasis on cultural commonalities, trustful collaboration and shared values between local actors (Cusmano, Morrison and Pandolfo, 2015). The Italian industrial districts were popular in the literature about industrial agglomerations in the late 1970s (Cusmano, Morrison and Pandolfo, 2015).

Two of the more recent models are Porter's Diamond and Scott's New Industrial Spaces Model (McCann, 2008). Vicente (2018) and Desrochers and Sautet (2004) argue that cluster theory did not became popular in literature until the 1990s, when Michael Porter published his Diamond model, which describes the four ways in which clusters create competitive advantages (Martin and Sunley, 2003). Porter's view of clusters is broader than Marshall's definition of industrial district as clusters are not limited to one type of industry but include linked industries and entities (Desrochers and Sautet, 2004). Porter holds the view that, although often concentrated to a city, clusters can be seen as spanning entire nations, and e.g. categorised Japan as a robotics cluster in the late 1980s (Porter, 1990).

3.1.2 Definition of Cluster

There are different ways to define clusters. Desrochers and Sautet (2004) define clusters as interconnected companies, firms in related industries, service providers, specialised suppliers, and associated institutions in a particular field. The associated institutions could be universities and trade associations. Furthermore, the different actors are geographically proximate and compete and/or cooperate with each other (Desrochers and Sautet, 2004). According to Dicken (2015), clusters can be identified as either generalised or specialised. Dicken's definition of specialised clusters is similar to the definition of Desrochers and Sautet and refers to firms within the same or related industry located geographically close to each other. On the other hand, generalised clusters, refer to the fact that human activities tend to agglomerate and form cities. The demand in these larger agglomerations are greater than in geographically dispersed cities and therefore, infrastructural, economic and social facilities emerge (Dicken, 2015). In this report, specialised cluster will be referred to if nothing else is specified.

3.1.3 Categorisation of Clusters

Clusters can be categorised as either industry clusters, where companies tend to locate themselves close to other companies within the same industry, or clusters where foreign firms locate near other companies with the same country of origin (Majocchi and Presutti, 2009; Tan and Meyer, 2011). These clusters are called origin clusters and are common when the foreign country differs from the home country in terms of culture and institutions (Shen and Puig, 2018). Companies entering a foreign market often face competitive disadvantages because they lack necessary knowledge about the market but by entering a origin cluster, they can establish relationships and learn how to adapt to the new location (Tan and Meyer, 2011).

Industrial clusters can be further categorised and Markusen (1996) presents four different types: the Marshallian Industrial District, the Hub-and-Spoke District, the Satellite Industrial Platform and the State Anchored District (sometimes called State-centred District). These four different types of clusters are also mentioned by Boja (2011) and Belussi (2018).

The Marshallian industrial districts are regions which consist of a business structure with small, locally owned firms with low levels of economy of scales and where key investment decisions are made locally (Markusen, 1996). The firms within the region tend to trade with each other and are

assumed to have limited linkages with actors outside of the industrial district (Markusen, 1996). According to Marshall's view of the industrial districts, they have a strong local labour market with owners and workers living in the same community where specialised industry knowledge is "in the air" (Markusen, 1996). Moreover, Markusen (1996) mentions an extended type of the Marshallian industrial district, which is called the Italianate industrial district, where competing firms cooperate to stabilise the market as well as sharing innovation and sharing risks. Examples of these kind of clusters are Silicon Valley in the US and the southern sector of Tokyo in Japan (Markusen, 1996). The name Italianate industrial district occurs fairly frequently in the literature but will be treated as a kind of Marshallian industrial district in this report.

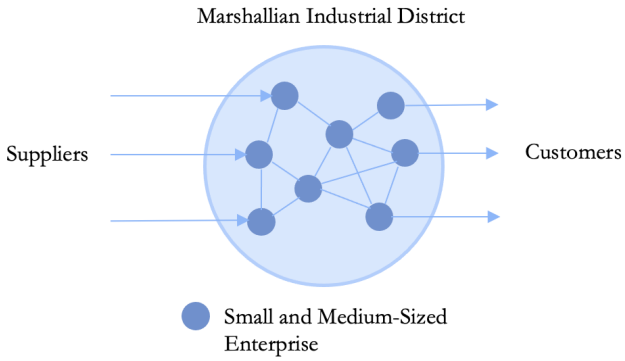


Figure 3.1: Illustration of the Marshallian Industrial District. Adapted from (Markusen, 1996).

The hub-and-spoke districts are characterised by a business structure where one or a few large firms are considered to be the hub of the regional economy and have suppliers and other related businesses around them (Markusen, 1996). The related businesses are visually described as the spokes of a wheel where the dominant firm is the hub. Moreover, there are usually long-term contracts between the large firm and its suppliers, where the hub firm sets the conditions and scale economies are high (Markusen, 1996). In contrast to the Italianate industrial districts, there is a low degree of cooperation between competing firms which hinders risk sharing and open innovation initiatives as well as absence of trade associations which provide necessary infrastructural features (Markusen, 1996). Examples of hub-and-spoke districts are Toyota City (close to Nagoya) in Japan and Seattle in the US, where Boeing is a hub company (Markusen, 1996).

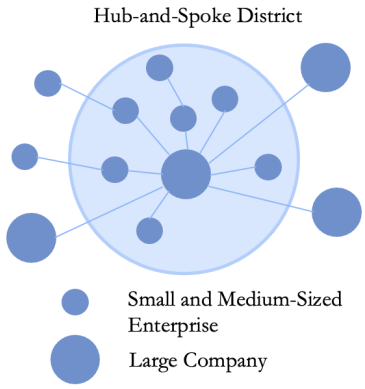


Figure 3.2: Illustration of the Hub-and-Spoke District. Adapted from (Markusen, 1996).

The satellite platform forms when large, multi-plant firms decide to place a facility outside of urban areas in order to reduce costs thanks to lower rents, wages and taxations (Markusen, 1996). Satellite industrial platforms often consist of routine assembly plants, such as Elkhart, Indiana which hosts several automobile plants due to relatively low wages. Markusen (1996) also classifies research centres hosting R&D units in seemingly unrelated fields, such as Research Triangle, North Carolina, as a satellite platform. The scale economies are medium to high in these districts and there is a low level of both trade and cooperative spirit between the firms (Markusen, 1996). Since the headquarters of the firms is located outside the satellite industrial platforms, key decisions are made externally and communicated to the branches (Markusen, 1996).

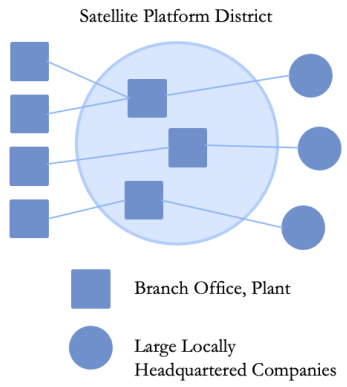


Figure 3.3: Illustration of the Satellite Platform District. Adapted from (Markusen, 1996).

The fourth category described by Markusen (1996) is the state anchored cluster which has a business structure where one or a few government institutions such as a public university, a concentration of government business or a military base are the main actors in the region. Examples of cities and regions that are developed from state-centred districts are Los Angeles where defence contracts stimulated post-war growth or Tsukuba in Japan which originates from the government's research centres (Markusen, 1996). Suppliers tend to be attracted to establish around the institutions and there is a high level of trade and cooperation between the local government institutions and the suppliers, especially if universities are involved (Markusen, 1996).

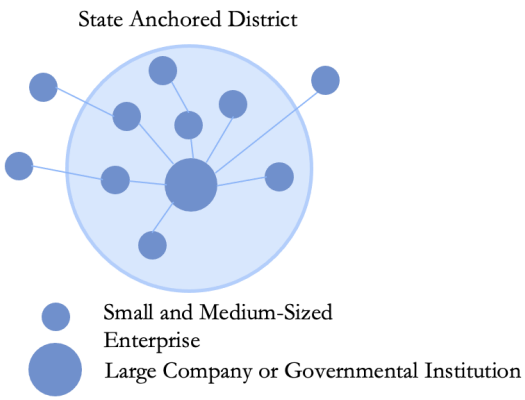


Figure 3.4: Illustration of the State Anchored District. Adapted from (Boja, 2011).

As a concluding remark, Markusen (1996) mentions that clusters are complex and are affected by several factors such as industrial structures, political factors and corporate strategies. It is noteworthy that in practise, one cluster could be a mix of two or more of these different types (e.g. the well-known example Silicon Valley is a mix of types) and clusters can develop from one type to another over time (Markusen, 1996).

The different cluster types mentioned above are presented in Figure 3.5.

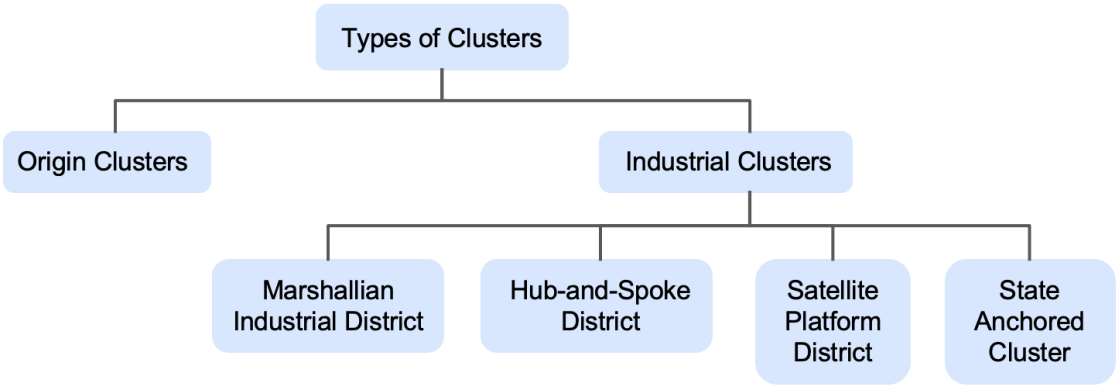


Figure 3.5: Types of clusters.

3.1.4 Cluster Emergence

It is difficult to explain why clusters are formed in one specific place and how they are developed over time (Dicken, 2015). Chiaroni and Chiesa (2006) have identified two main categories of cluster emergence: those that have been established as spontaneous agglomerations of related firms and entities (Spontaneous clusters), and those that are created by governmental actors who want to set the conditions of the cluster (Policy-driven clusters). Chiaroni and Chiesa (2006) have studied clusters within biotechnology and concluded that spontaneous clusters tend to grow and develop if there is an excellent scientific base in place, mechanisms for entrepreneurial culture diffusion and technology transfer as well as available funding for new ventures. Clusters in general tend to grow through a process of self-reinforcing development which involves factors such as an entrepreneurial and innovative culture, economic diversification, enhanced physical infrastructures, attraction of firms with related activities and local institutions as well as a larger and more competent pool of local labour (Dicken, 2015). The development of clusters is a cumulative process which means that the cluster is influenced by the history of the specific location (Dicken, 2015). Influences from history could be a source of growth but also a source of weakness as it can hinder the adaption to external changes and lock in the cluster to a phase of decline (Dicken, 2015).

3.2 Porter's Diamond

3.2.1 Overview

One of the most influential theories on clusters was developed by Michael Porter in his book "The Competitive Advantage of Nations" (Isserman, 1998; McCann, 2008). In the book, which is based on case studies of more than 100 industries in ten different countries, Porter proposes the Diamond model to explain why internationally successful companies in certain sophisticated industry segments tend to be concentrated to one or a few nations. He dubs these concentrations "clusters" because he believes they are fuelled by local circumstances and interactions between companies. The Diamond model, illustrated in Figure 3.6, consists of the four main determinants: Factor conditions, Demand conditions, Related and supporting industries as well as Firm strategy, structure and rivalry.

An important aspect of the Diamond model, Porter (1990) says, is that the determinants affect each other. For example, an industry exposed to beneficial demand conditions will not gain advantage from this unless there is sufficient rivalry within the cluster.

Porter (1990) argues that the four determinants of national competitive advantage can be distorted or fundamentally changed by acts of chance or government intervention. Chance events include disruptive innovation, sudden changes in input costs and significant shifts in world financial markets and demand patterns. Moreover, governments can influence each of the determinants, for example by investing in factor development, promoting rivalry through antitrust laws, or affecting demand conditions as a direct buyer.

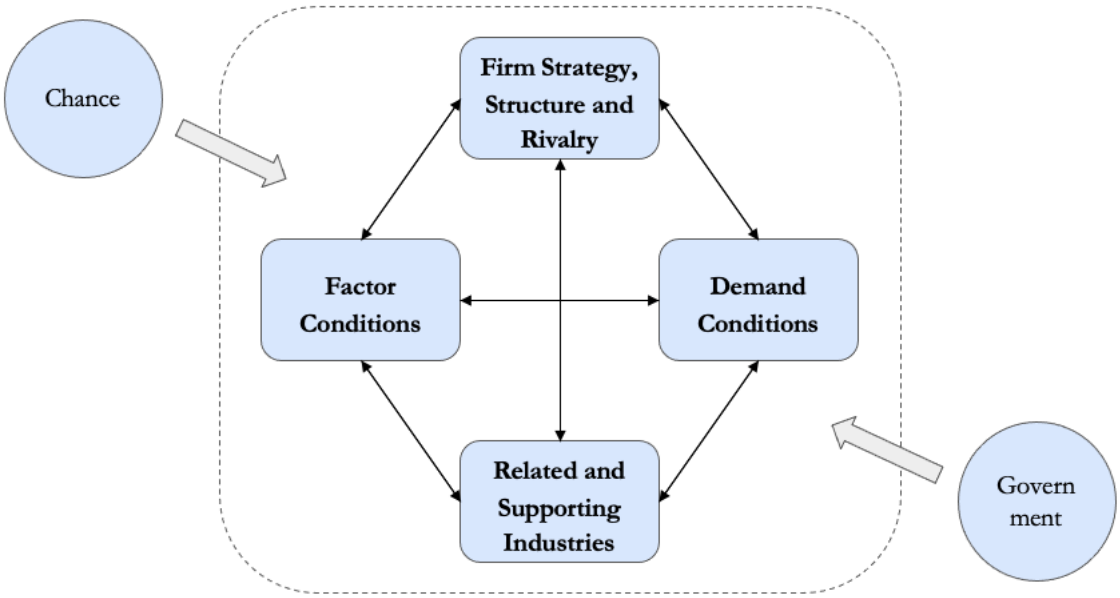


Figure 3.6: Porter's Diamond. Adapted from Porter (1990, p. 127).

3.2.2 Factor Conditions

Factor conditions are the necessary factors of production which a nation possesses. Porter includes not only physical resources such as arable land or minerals but also human and knowledge resources, infrastructure, and access to capital. Moreover, Porter argues that different sets of factor conditions create beneficial circumstances for different industry segments to develop international competitive advantage, especially if the other determinants of the Diamond are suitable.

All factor conditions, argues Porter (1990), are not equally valuable to a cluster's competitive advantage. Porter distinguishes between basic and advanced factors, as well as between general and specialised. To exemplify, a basic human factor could be a large pool of low-skilled but motivated workers, whereas an advanced equivalent would be a large pool of engineers. General factors are ones that can be employed in most industries, whereas specialised factors are specifically useful to a certain field. An example is that a general factor might be good access to capital markets, and a specialised factor might be a network of venture capital and angel investors with a focus on MedTech. Porter argues that advanced and specialised factors are superior to basic and general in creating competitive advantage for firms in a cluster.

3.2.3 Demand Conditions

The second determinant in Porter's Diamond is the character of the local demand. Porter argues that since product development is typically concentrated to a company's home base, it is much easier for most companies to understand and incorporate the needs of local buyers. Above all, proximity to the right quality (rather than quantity) demand can give companies a competitive advantage.

When it comes to the composition of local demand, Porter (1990) finds that segment structure, degree of sophistication and anticipatory ability are the three most important features of local demand. Segment structure refers to how the idea that if a certain segment is disproportionately large in a certain market, companies in that market will make this segment a priority and subsequently devote more of their resources to investments and innovation in this area. Competitors with other home markets, however, might over-look this segment due to its relatively low market share. Sophisticated buyers in the home market will incentivise suppliers to push the limits of what their products are capable of, which will in turn give them an advantage in other markets. For example, Japanese buyers demanded quiet and compact air conditioning units due to the warm summers and often cramped accommodations. This led Japanese companies to produce products that were also very successful internationally. Anticipatory demand refers to buyers who's changing needs predict those of other markets. For example, early Swedish devotion to disability adaptation gave Swedish companies a head starts in product development, which has led them to international success.

3.2.4 Related and Supporting Industries

The third determinant in the Diamond model is the presence of related and supporting industries. Proximity to supporting industries can provide an advantage because home markets tend to get early and preferential access to new products. However, Porter (1990) argues that such benefits

are rarely durable. Instead, Porter finds that coordination is much more efficient with domestic than with foreign suppliers, and that this drives competitive advantage. Through cooperation with suppliers, the industry can utilise their inputs more effectively. By a mirrored effect of demand conditions, they can also influence the suppliers' research priorities, encouraging them to focus their efforts on producing the inputs that best serves their needs.

Porter (1990) defines related industries as ones that can coordinate and share inputs, or that sell complementary products. By coordinating activities such as distribution and marketing, related industries can create efficiency gains, and thanks to their proximity they can share knowledge and technologies. International success in one industry can also drive international demand for complementary products, especially if products from the same country are more compatible than others.

3.2.5 Firm Strategy, Structure and Rivalry

The last determinant in the Diamond is firm strategy, structure and rivalry. Porter (1990) divides this category further into strategy and structure, goals and rivalry.

The typical strategy and structure of companies varies greatly within nations, but Porter (1990) argues that there are clear between-nation patterns. As an example, Italian firms are often small- and medium sized, family-centred companies that compete in areas where scale economics are modest. German firms tend to promote technically skilled managers and hierarchical structures, giving them an edge in field with technically complex products. Porter (1990) stresses that no one management style is optimal always, but that certain styles complement the other determinants of the Diamond model.

The goals of companies, individuals and the culture as a whole are also affected by location. Porter (1990) writes that company goals are largely affected by the ownership structure and the ways in which owners can influence management. The main distinction Porter discusses is whether these factors favour long- or short-term gains and risk averse or opportunistic behaviour. Similarly, Porter argues that individuals' compensational structure, employer relationships and perceptions of status affect what industries are successful. Lastly, different cultures value different industries or activities. Porter argues that this influences how talent is allocated in that nation. As an example, Porter mentions that during the Space Race, great amounts of talents were directed towards the space industry largely because it was seen as a prestigious field.

Domestic rivalry is among the factors with the strongest empirical connection to international success, according to Porter's research. Whatever harm companies might suffer from strong competition in the domestic market, Porter argues, is greatly outweighed by several benefits. Firstly, domestic competition is much more visible than foreign, it is more clearly "felt". This forces firms to appreciate and adapt to the competition they are under. Secondly, since collocated firms have essentially the same factor conditions, they are forced to develop other, more sustainable, and advanced advantages to compete. Lastly, (Porter, 1990) mentions, just as between suppliers, buyers and related industries, information flow between local rivals is often substantial, which means that

the rivals share knowledge and learn together. All in all, Porter says, local rivalry augments the effect of all the other determinants of the Diamond model.

3.2.6 Additional Remarks on the Diamond Model

Here, the authors would like to discuss the Diamond model's relevance to the research question of this thesis, namely how companies can interact with clusters which are not their home base. It is worth noting that Porter's Diamond is concerned with explaining the success of whole industries, and not necessarily the individual companies within each cluster. In fact, Porter mentions as one of the benefits of domestic rivalry that many companies will fail due to the harsh competition, and that those fit enough to survive will come out stronger. For the companies that do fail, the success of the cluster probably offers little consolation.

Another aspect, that Porter himself mentions, is that although his book is mainly concerned with the competition between nations and their industries, clusters are rarely formed around a whole nation but rather around a city or region. This indicates that his model, although often expressed in terms of nations, is also relevant for analysing regional clusters.

Finally, the main issue is that Porter's model places great importance on the home base as the source of a company's competitive advantage. Many of his arguments build on the idea that a cluster's benefits can only fully be taken advantage of by the companies who have their home base there. Porter's and others' views on this will be discussed further in the next section.

3.3 Tapping into Clusters

3.3.1 Motives for Cluster Interaction

Management theory typically distinguishes between different motivations for firms to internationalise. Dicken (2015), divides motives into market seeking and asset seeking. Market seeking, which Dicken (2015) argues is the most common motive, refers to companies establishing presence abroad in order to access a new market. Asset seeking companies internationalise because they want to access some sort of asset, tangible or intangible, which is either not available or more expensive in their home base. In other models, assets seeking behaviour is further divided into resource seeking and non-marketable asset seeking (Franco, Rentocchini and Marzetti, 2010). In this distinction, resources are taken to mean natural resources as well as both skilled and unskilled labour. Franco, Rentocchini and Marzetti (2010) argue that all these things can potentially be traded through transactions, for example through outsourcing. Non-marketable assets, on the other hand, are things which depend on the local context and therefore cannot be traded through contracts. Franco, Rentocchini and Marzetti (2010) mention technological knowledge and better linkages to suppliers and customers as important non-marketable assets.

These models were conceived to describe the motives for FDI generally. After noting that factor conditions in Porter's model is analogous to resources, and that the other three determinants are all examples of non-marketable assets, it is evident that the motives are relevant specifically for interacting with clusters too. By combining the models of Franco et. al. and Porter, the motives

for interacting with a cluster can be described as in Figure 3.7. In the figure, some lexical changes have been made to Porter's model. The factor Supporting and Related industries is called Supplier Conditions, and the determinant Firm Strategy, Structure and Rivalry is simply called Rivalry Conditions.

As mentioned in section 3.1.3, Shen and Puig (2018) have a described the special case of origin clusters. These clusters consist of companies who wish to facilitate their entry in a foreign market by drawing from the experience of compatriot companies, and who's motivations can therefore be considered a form of knowledge seeking. This is indicated in Figure 3.7 as market access knowledge.

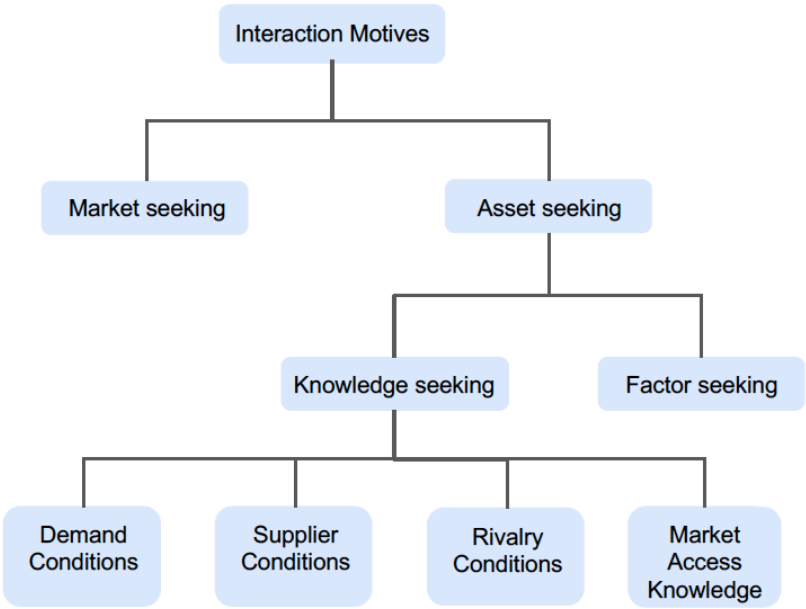


Figure 3.7: Motives for engaging with a cluster.

Despite his emphasis on the home base, Porter (1990) admits that firms must complement those advantages with favourable conditions found elsewhere, in a process he calls selective tapping. By creating subsidiaries, acquiring foreign companies, or joining alliances, companies can to a certain extent access the benefits of other clusters. However, Porter argues that the more immersed an office becomes in the local environment, the less able it becomes to spread the advantages it gains back to the home base, as it becomes too culturally removed. If a company truly wants to take advantage of a foreign cluster it must therefore transplant its home base for that business unit into the target cluster.

The most significantly contrasting view to Porter's is the heterarchical model (Sölvell and Zander, 1995). Originally proposed by Hedlund (1986), it views the dispersed activities of MNEs not primarily as an obstruction but rather as an asset. According to Sölvell and Zander (1995), the heterarchical model differs from Porter's Diamond in two main ways: its view of what drives innovation in MNEs and how MNEs are organised. While Porter argues that innovation is mainly created by the company's networking with the local environment, Hedlund believes that radical innovation happens when MNEs connect pockets of knowledge from different locations. Porter considers

most companies to be organised according to a clear hierarchy between HQ and subsidiaries, while Hedlund believes that many companies are heterarchical (non-hierarchical) with complex and varying responsibilities among offices (Sölvell and Zander, 1995). Despite their differences, Porter and Hedlund share the view that location is important, and that MNEs should leverage assets from multiple location to maximise their competitive advantage. More authors have empirically shown the importance of utilising international knowledge, especially in innovative companies, e.g. (Patel *et al.*, 2014; Li and Bathelt, 2018). In other words, there is a theoretical basis to assume that this is a viable strategy for companies to employ.

3.3.2 Interaction Strategies

Having established the motives for interacting with clusters outside of a company's home base, the question remains of how to do this. A logical distinction of interaction strategies is between those that implicate some form of activity and investment in the cluster and those that do not. The first group will be referred to as co-location modes and the second group as remote modes.

The topic of foreign market entry, especially with market seeking intentions, has been widely described by academics (Asmussen, Benito and Petersen, 2009). When describing asset seeking entry into clusters, many references use categorisations of entry modes similar to the co-location modes illustrated in Figure 3.8, e.g. (Meyer, Wright and Pruthi, 2009; Mudambi and Santangelo, 2016; Shen and Puig, 2018). Multiple have argued that the mode matters to a company's success in approaching clusters (Meyer, Wright and Pruthi, 2009; Mudambi and Santangelo, 2016).

Many traditional models of internationalisation (one of the more famous is called the Uppsala Model) suggest that companies take an evolutionary approach to foreign market entry, for example starting with exports directly, through a distributor or through a licensing agreement (Johanson and Vahlne, 1977; Dicken, 2015). In Figure 3.8, these entry modes are referred to collectively as remote modes. Other remote interaction modes could be conceived which are not transaction based, e.g. networking at trade fairs.

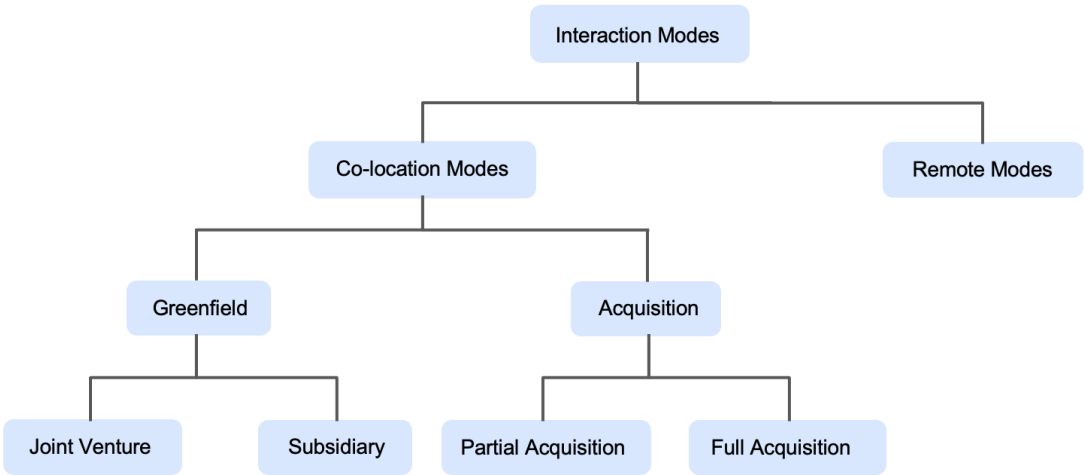


Figure 3.8: Interaction modes with clusters.

In addition to the modes described above, an important aspect of cluster interaction strategies seems to be what activities are located in the cluster. For example, Porter's (1990) and Hedlund's (1986) differences are largely based on what activities and responsibilities are given to subsidiaries, and other authors have discussed similar strategic choices (Slepniov, Wæhrens and Johansen, 2014). This aspect of interaction strategy will be referred to as activity allocation.

3.3.3 Cluster Characteristics

The choice of interacting with a cluster depends on the clusters current state as well as its predicted future state (Sedita, Caloffi and Belussi, 2013; Marchi, Maria and Gereffi, 2017). There are different ways to describe cluster development and many researchers state that clusters have a life cycle similar to industries with the phases birth, growth, maturity and decline (Boja, 2011; Ingstrup and Damgaard, 2013). Marchi, Maria and Gereffi (2017) and Belussi (2018) specify that a cluster can be in its origin, development (growth) or maturity phase based on the number of firms and employees the cluster has and the cluster's social and business relationships. The origin phase is when the cluster emerges and local knowledge and institutions have not yet been formed, but the cluster may still have a history of related knowledge and competencies (Belussi, 2018). The growth phase is characterised by more firms entering the cluster and specialised knowledge being built up within the cluster firms (Belussi, 2018). The cluster benefits from spin-off effects of the companies that have created the cluster and the knowledge transferred between firms is mainly tacit which makes it difficult for external firms to access the specialised knowledge (Belussi, 2018). The third phase, maturity phase, is characterised by a lower growth rate of new firms entering the cluster, some of the tacit knowledge becoming codified and a lower number of new innovations (Belussi, 2018). Marchi, Maria and Gereffi (2017) argue that MNEs can enter during different phases of the cluster's life cycle but they tend to enter a cluster in its origin or maturity phase.

As described in section 3.1.3 and illustrated in Figure 3.5, clusters can be categorised into different types which have different underlying drivers and intercompany dynamics. Therefore, it is worth exploring whether cluster type affects how companies chose to interact with a cluster.

Many of the explanations to how clusters create competitive advantages, e.g. tacit knowledge sharing, collaboration and shared values, rely on interpersonal relationships which can be affected by local culture. Porter also describes the importance of culture in shaping a cluster's advantages. Therefore, it is worth exploring what effect cultural factors have on the interaction strategy. The cultural differences between Sweden and Japan will be further described in section 4.3.

3.3.4 Company Characteristics

A natural hypothesis is that firm-specific characteristics can affect interaction strategy choice. An extensive literature study of international entry mode research by Brouthers and Hennart (2007) found conflicting evidence for, but could not rule out, the influence of firm size, industry/sector affiliation and differences between service and manufacturing companies. The last factor will be referred to as service vs. product, as e.g. software companies create a tangible product but do not manufacture anything in a traditional sense.

Another set of articles focuses on how a company's experiences affect their entry mode choice, most notably the aforementioned Uppsala Model which emphasises an evolutionary approach of increasing foreign commitments (Johanson and Vahlne, 1977). More recent articles also emphasise the importance of international experience (Shen and Puig, 2018; Kotler *et al.*, 2019) and argue that companies often become positively or negatively biased towards entry modes they have used before (Kotler *et al.*, 2019). Nielsen and Nielsen (2011) have found that top management's personal experience and national diversity affects their preferred entry choice as well.

3.4 A Model of Interaction Strategy Choice

The discussion in section 3.3 can be summarised by the following model. Interaction strategy choice is affected by three factors: the motives for interacting with the cluster, the characteristics of the target cluster and the characteristics of the company. The model is illustrated schematically in Figure 3.9 below. The three top circles each illustrate one of the three categories which can affect the interaction strategy choice. The grey arrows represent the ways in which the three categories affect the interaction strategy. The grey, dashed arrows indicate the ways in which the three explanatory categories are linked and affect each other.

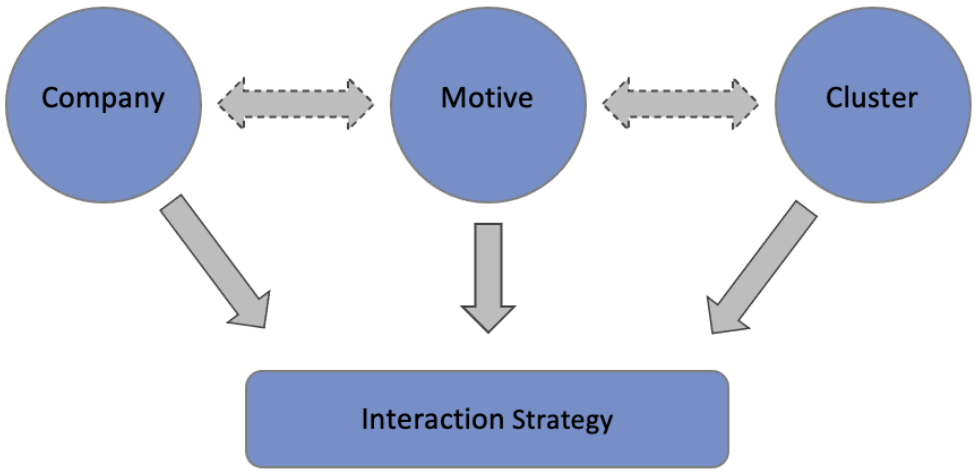


Figure 3.9: A schematic illustration of the Interaction Strategy Choice model.

In the literature review above, several variable components of Interaction Strategy, Motive, Cluster and Company characteristics were identified. These are summarised in Table 3.1.

Table 3.1: Summary of the components of the Interacting Strategy Choice Model.

Components of the Interaction Strategy Choice Model	
Interaction Strategy	*Interaction Mode* ◊ Remote Modes ◊ Co-location Modes ♦ Subsidiary (Greenfield) ♦ Joint Venture (Greenfield) ♦ Full Acquisition (Acquisition) ♦ Partial Acquisition (Acquisition) *Activity Allocation*
Motive for Interaction	*Market Seeking* *Asset Seeking* ◊ Factor Seeking ◊ Knowledge Seeking ♦ Demand Conditions ♦ Supplier Conditions ♦ Rivalry Conditions ♦ Market Access Knowledge
Cluster Characteristics	*Cluster Type* ◊ Origin Cluster ◊ Industrial Cluster ♦ Marshallian ♦ Hub-and-spoke ♦ Satellite Platform ♦ State Anchored *Cluster Life Cycle* ◊ Origin ◊ Growth ◊ Maturity ◊ Decline *Cultural Factors*
Company Characteristics	*Size* *Industry* *Service vs Product* *International Experience* ◊ *In Company* ◊ *In Top Management*

4 Setting the Context: Japan

In this section, factors related to the context of Japan are discussed. First, differences between the Japanese and western definition of clusters are discussed, and some of the most important clusters in Japan are presented. Second, Japan's corporate structure and the term keiretsu is examined. Finally, a cultural comparison between Japan and Sweden, based on the works of Geert Hofstede, is presented.

4.1 Clusters in Japan

Japan has developed an important community of clusters with at least 52 cluster organisations present in 2016 (EU-Japan Centre for Industrial Cooperation, no date). However, according to EU-Japan Centre for Industrial Cooperation (no date), the definition of cluster differs between Japan and the EU where the Japanese term cluster refers to R&D centres with the purpose to coordinate universities, private companies and the public entities to realise specific research projects. The projects are often publicly funded and when the goals of the project are achieved, the cluster ends it activities (EU-Japan Centre for Industrial Cooperation, no date). The aim of the Japanese cluster is in general not internationalisation, which is illustrated by the fact that out of 52 clusters, only nine provide an updated English website (EU-Japan Centre for Industrial Cooperation, no date).

Yamawaki (2002) presents a survey in the article "The Evolution and Structure of Industrial Clusters in Japan" where Japanese clusters are studied to identify the advantages of being present in Japanese clusters. The three most popular advantages is shown to be specialisation of labour, ease of procurement and technology spill-overs among companies within the same cluster (Yamawaki, 2002). Although the definition of clusters differ, the advantages of being located in Japanese clusters comply with the advantages described by (McCann, 2008).

The Japanese government has initiated industrial cluster policies to strengthen Japan's industrial competitiveness (Tillväxtanalys, 2010; EU-Japan Centre for Industrial Cooperation, no date) through industrial clusters consisting of SMEs, universities and research institutions (METI, no date). The Ministry of Economy, Trade and Industry (METI) introduced the "Industrial Cluster Project" in 2001 with the purpose of forming industrial clusters consisting of SMEs and start-ups related to research results from knowledge institutions (METI, no date). METI's program includes 18 different clusters within the five areas of energy, biotechnology, IT, healthcare, and environment (Tillväxtanalys, 2010).

An additional initiative by the government is the "Knowledge Cluster Initiative" which was established by The Ministry of Education, Culture, Sports, Science and Technology (MEXT) in 2002, with the purpose to conduct joint research in order to stimulate the development of new technologies (EU-Japan Centre for Industrial Cooperation, no date). These knowledge clusters focus on technological innovation and are located around universities and other knowledge institutions.

The initiatives by MEXT and METI are coordinated and are described such that MEXT's knowledge clusters should provide METI's industrial clusters with the latest research for commercialisation (Tillväxtanalys, 2010). At the same time, the industrial clusters should provide the knowledge clusters with information about market trends and demands (Tillväxtanalys, 2010). Additionally, both MEXT and METI emphasise the importance of internationalisation in clusters but this is still a challenge for several clusters and companies, partly because of language barriers (Tillväxtanalys, 2010).

There are also several examples of industrial clusters, which are not initiated by the government, in Japan where a concentration of companies within the same industry are located in the same area (EU-Japan Centre for Industrial Cooperation, no date). One of these clusters is the "TAMA Industrial Cluster" located in the region around the Tama river, west of Tokyo (Tillväxtanalys, 2010). The industrial cluster consists of large corporations' R&D units, academia as well as high growth companies within industries like the transport sector and electronics (Tillväxtanalys, 2010). According to Arita, Fujita and Kameyama (2006), main industries in Tama are general machinery and telecommunication. It has been shown that SMEs within TAMA industrial cluster have filed more patent applications and launched more products than the Japanese average, which indicates that the cluster creates synergies (Tillväxtanalys, 2010).

Another important industry cluster is the Osaka metropolitan which according to EU-Japan Centre for Industrial Cooperation (2016), is the heart of Japan's biotech industry and hosts several cluster organisations within biotech such as Kobe Biomedical Innovation Cluster and the Northern Osaka Biomedical Cluster (EU-Japan Centre for Industrial Cooperation, 2013). Moreover, the city Hamamatsu, located between Tokyo and Osaka, is also a cluster and is well-known for the manufacturing of musical instruments and motorcycles. The city hosts companies such as Honda Motor Co, Suzuki Motor Co, Yamaha Corporation and Kawai Musical Instruments Mfg. (Tillväxtanalys, 2010).

Two additional examples of regional clusters in Japan are Tsukuba and the Kyushu Island. Tsukuba became a centre for science when national R&D and high-level research was transferred from Tokyo in an attempt to ease the congestion of Tokyo (City of Tsukuba, no date).The city is located less than an hour outside of Tokyo and is Japan's largest accumulation of science technology (City of Tsukuba, no date). Moreover, Kyushu is the centre of the semiconductor industry and is known as "Silicon Island" because it hosts around 800 semiconductor-related companies (Kyushu Economic Federation, no date). The region is part of METI's Industrial Cluster Project where the Government aims to increase Japan's competitiveness within the global semiconductor industry (Kyushu Economic Federation, no date).

In addition to the described regional clusters, Japan as a nation can also be seen as a prominent cluster within certain industries (Porter, 1990). Japan was described by Porter as the forefront within the robotics industry, especially robots used in manufacturing operations or as material transporters between machines in factories (1990). The demand from leading companies within prominent Japanese industries such as the automotive and the electronics industry, was important for the development of industrial robots (Porter, 1990). Illustrative of the domestic demand, Japan

had the second highest number of both operational and newly installed industry robots in 2019 (JETRO, 2021b).

There are also examples of newly started and up-to-date clusters within robotics and automation. In the beginning of January 2020, at the CES in Las Vegas, Toyota revealed their plan to build "the city of the future" called Woven City (Toyota, 2020). Woven City will act as a living laboratory, a place where academic partners and researchers are invited to collaboration where they can test and develop new technologies with less strict regulations but still in real-world settings (Toyota, 2020). Focus will be on technologies such as robotics, artificial intelligence, smart homes, and personal mobility. Moreover, Toyota states that the city will be permeated by a focus on sustainability, with buildings made mostly by wood and with renewable energy sources and where the goal is to change the view of urban planning. Akio Toyoda, president of Toyota Motor Corporation says:

"We welcome all those inspired to improve the way we live in the future, to take advantage of this unique research ecosystem and join us in our quest to create an ever-better way of life and mobility for all" (Toyota, 2020).

On February 23 2021, Toyota marked the start of the construction of Woven City and stated that the project is proceeding as planned and has not been delayed due to the Covid-19 pandemic (Toyota Times, 2021). Woven City will be located at the former Toyota manufacturing plant Higashi-Fuji (Toyota, 2020), at the foot of Mount Fuji, which has produced vehicles for more than 50 years (Toyota Times, 2021). The Higashi-Fuji Plant can be dated back to the 1960s and has been important for Toyota's as well as Japan's growth of motorisation (Toyota Times, 2021). During the inauguration speech by Akio Toyoda, he mentions that the DNA of this location is the spirit of kaizen, which is a Japanese term form continuous improvement, and that the DNA should be weaved into Woven City (Toyota Times, 2021). Toyoda's ideas about the DNA of the Higashi-Fuji Plant resembles Marshall's theory about industrial atmosphere.

4.2 Keiretsu: Corporate Structures in Japan

The industry structure in Japan is characterised by inter-corporate networks arranged in complex webs (McGuire and Dow, 2003). These networks, or organisational arrangements (Lai, 1999), are commonly known as keiretsu. Keiretsu networks play an important role in the Japanese economy and some date back to the 19th century while others originated in the post-war era (McGuire and Dow, 2003). They were introduced by the government in order to stimulate industrial growth as well as to protect the domestic market from foreign competition (Thomas and Peterson, 2015). Keiretsu's role to protect the domestic market from international competitors has been pointed out as one of the reasons behind Japan's high entry barriers for foreign companies and the closed nature of the market overall (Thomas and Peterson, 2015).

The two different kinds of keiretsu are horizontal and vertical (Lincoln and Shimotani, 2010). A horizontal keiretsu is a network commonly tied to a large bank which holds equity and board positions (McGuire and Dow, 2009). Historically, the Japanese economy has been dominated by six different horizontal keiretsu (McGuire and Dow, 2009). Among the benefits of being part of a

horizontal keiretsu are access to stable financing when needed, risk reduction and difficulties for outside stakeholders to affect how the firm is governed (McGuire and Dow, 2009).

The vertical keiretsu usually consist of one larger firm and its suppliers and buyers, where two well-known examples are the networks arranged around the Japanese automobile companies Toyota and Honda (McGuire and Dow, 2009). In contrast to horizontal keiretsu where the ownership is symmetric, the network in vertical keiretsu is centred around the major firm and its key suppliers (McGuire and Dow, 2009), and as such bears resemblance to a hub-and-spoke cluster.

4.3 Cultural Differences between Sweden and Japan

Nations can be seen as "containers" with distinctive variations regarding culture, institutions and practices (Dicken, 2015). Geert Hofstede conducted a study on more than 100 000 employees of IBM located in 50 different countries (Hofstede, 2011), which is the most well-known study of how culture differs between nations (Dicken, 2015). Hofstede argued that by studying a controlled population, i.e. employees within the same organisation, it was possible to isolate nationality as the variable and analyse cultural differences (Dicken, 2015). The research was conducted in the 1970s (with data collected between 1967 and 1973, and the results were validated again year 2010), where Hofstede distinguished six different cultural dimensions (Hofstede Insights, no date):

1. The Power Distance Index - Refers to what degree less powerful members of a society accept the situation with unequal distribution of power. Overall, this dimension regards how a society handles inequality. In countries with a high degree of power distance, people accept a hierarchical order where everyone has their place. On the contrary, a low degree of power distance in society means that people are concerned about unequal distribution of power and strive to make it more equal.

2. The Individualism Index – Individualism refers to a society structure where people are expected to take care of themselves. On the other side of the spectra, collectivism, refers to a society with strong cohesiveness and loyalty among the people. Overall, this dimension can be identified as whether people categorise themselves as "I" (individualism) or "We" (collectivism).

3. The Masculinity Index – a masculine society is characterised by a focus on achievements, toughness, and material success while a feminine society is characterised by a cooperative spirit, modesty, and appreciation of life quality. Masculine society is competitive and feminine society is more consensus oriented.

4. The Uncertainty Avoidance Index – refers to how comfortable a society is when handling the unexpected and the fact that the future is ambiguous. A high index score indicates that a society want to control the future while a low score indicates a more relaxed culture towards the unexpected.

5. Long-term Orientation – refers to how societies face challenges of the future. A high score is achieved by a long-term oriented society with a pragmatic approach which values long-term

benefits. A low score indicates that a society prefer time-honoured traditions and have a suspicious mindset towards societal changes.

6. Indulgence versus restraint – an indulgent society allows leisure time and let people enjoy life while a more restrained society tends to be more pessimistic and feel restrained by social norms.

These six dimensions are relative between countries' culture and should only be used when comparing cultures (Hofstede Insights, no date). A comparison between Sweden and Japan regarding these six dimensions can be seen in Figure 4.1. The figure is followed by Hofstede Insights (2021) comments on the comparison between Sweden and Japan.

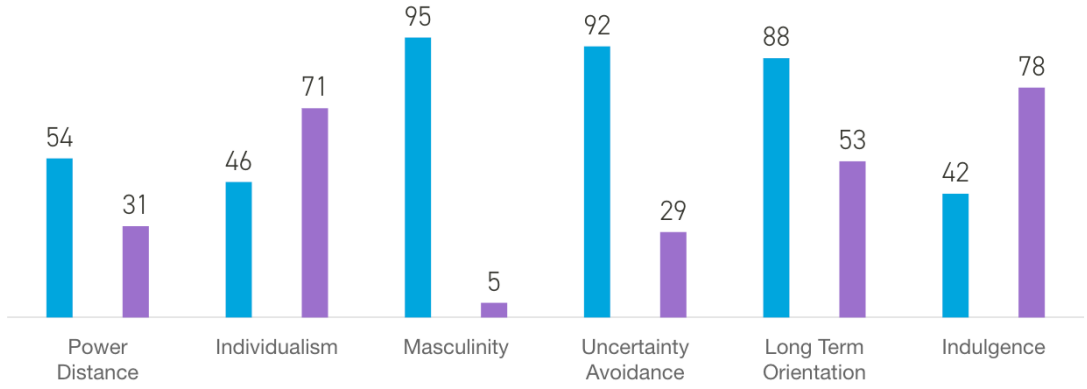


Figure 4.1: A comparison between the cultures of Japan (blue) and Sweden (purple) according to Hofstede's six dimensions (Hofstede Insights, 2021).

With a score of 54 regarding power distance, Japan is seen as a more hierarchical society than Sweden, where people act accordingly to their hierarchical position in social settings. However, Japan's score is not noticeably higher than the average and it is even considered low compared to other countries in Asia. Moreover, Sweden scores higher than Japan regarding individualism index which indicates that the people in Sweden are more self-centred and have a weaker cohesion. Regarding masculinity and uncertainty avoidance, Japan scores very high (95 and 92 respectively) and is one of the most masculine and uncertainty avoiding countries in the world. The masculinity is shown by a tough and competitive environment among competing firms and the drive for excellence among the Japanese employees as well as a sometimes excessive devotion to their work. The high score of uncertainty avoidance can be seen in the way Japanese companies work with detailed risk analyses before taking any decisions and initiation of projects. The high degree of uncertainty avoidance is a reason why it is so difficult to drive change in Japan. On the contrary to Japan, Sweden scores low on masculinity and is a feminine country with focus on cooperation and reaching consensus before taking decision. Additionally, Sweden scores low on uncertainty avoidance which indicates a higher flexibility compared to Japan. Regarding long-term orientation, Japan scores 88 and is one of the most long-term oriented countries. This is characterised by the Japanese mindset that their life is a short period of time in the long history of mankind and Japanese companies' large investments in R&D, even in difficult times. Swedish companies, with a lower score

of 53, tend to focus more on making profit quarterly, rather than investments in the long-term perspective. Lastly, Japan scores lower than Sweden regarding indulgence which indicates that the Swedish culture emphasise leisure time more than the Japanese culture. (Hofstede Insights, 2021)

5 Empirics

This section covers the empirical results from the thesis. First, findings from the exploratory interviews are presented. Subsequently, each of the seven cases are presented in the form of individual case reports. Finally, a tabular summary of the obtained results is included to make the cases easy to survey.

5.1 Exploratory Interviews

In the exploratory interviews, some interaction modes emerged which were not discovered in the literature review or in the main case study. Although these results are not necessarily relevant to Swedish companies relating to Japanese clusters, they have been included here as they contribute to the purpose of understanding cluster interacting strategies more generally.

Christina Wanscher – Odense Robotics

All the following information is retrieved from the digital interview with Christina Wanscher, Network Manager at Odense Robotics, the 11th of February 2021, if not stated otherwise.

Wanscher described that Odense Robotics, a cluster organisation, enables its member companies to connect with other robotics clusters primarily by arranging and finding funding for study trips. Some trips are sales oriented, while others focus on matching member companies with partners from other clusters, sharing knowledge and attracting workers. In this way, being a member of Odense Robotics, or a similar network facilitator, enables companies to interact remotely with clusters.

Mats Lindoff – Sony Ericsson

All the following information is retrieved from the digital interview with Mats Lindoff, earlier CTO at Sony Ericsson, the 16th of February 2021, if not stated otherwise.

Lindoff described in the interview that he as CTO for Sony Ericsson employed consultant technology scouts based in important locations for mobile phone technology. The scouts, one to two in each cluster, attended technology fairs and read patents to figure out what new technologies could affect the mobile phone industry. Lindoff described this as an expensive, remote interaction mode which is only viable for very large companies.

5.2 Case 1 – Piab

5.2.1 Background

Piab is a manufacturing automation company which develops and distributes components and solutions within lifting, gripping and moving applications to different industries such as consumer goods, pharmaceuticals and the automotive industry (Piab, no date). They are a global company with sales in more than 100 countries and has around 650 employees (Piab, no date). Piab was established in 1951 and have their headquarters in Täby, Sweden (Piab, no date).

In the late 1960s, Piab started its vacuum division which is the basis of the business today, where some of the prominent products are vacuum ejectors, vacuum pumps and vacuum conveyors (Piab, no date). Additionally, through multiple acquisitions, the product portfolio has been expanded with handling and gripping products (Piab, no date).

Kazuyuki Yoshie is Representative Director of Piab Japan and has been so for three years. He has previously served in similar positions at other foreign technology companies. Josef Karbassi is President of the Vacuum Automation Division, which is the business unit that has the most sales in Japan. He has served in various roles at Piab since 2001.

All the following information is retrieved from the digital interview with Kazuyuki Yoshie, Representative Director of Piab Japan, the 5th of April 2021 and the digital interview with Josef Karbassi, President of the Vacuum Automation Division of Piab AB, the 6th of April 2021, if not stated otherwise.

5.2.2 Company Characteristics

Company Size

Piab established in Japan in 1993 and has its office located in a residential area of Tokyo. The Japanese subsidiary has nine employees, as compared with Piab's total 650, and the Japanese market constitutes a few percent of total revenue.

Industry

Piab is a product company within the manufacturing automation industry and commonly sells its products to system integrators which use Piab's products as components to their systems.

International Experience

Piab has subsidiaries in 12 countries in addition to their business in Sweden. The subsidiaries are in countries with large economies such as the US, Germany, Japan and China, and in the countries where Piab does not have any subsidiary, they are active through resellers. Although Japan was one of the first markets Piab entered in Asia, they had previous experiences of international affairs from their establishment in the US and in Europe. Moreover, Karbassi believes that personal experiences might have affected the choice of establishment strategy, however, it is not clear how.

5.2.3 Cluster Characteristics

Cluster Type

According to Karbassi, the Japanese automation industry is very prominent, matched only by that of certain European countries (e.g. Germany and Sweden) and the US. The most important reason for its competitiveness, is demand conditions in the form of a domestic manufacturing industry which has extreme quality standards and an opportunistic attitude towards automation. According to the interviewees, the latter depends on both a cultural affection for robots and a decreasing workforce which requires employers to make do without people. Illustrative of the domestic demand, Japan had the second highest number of both operational and newly installed industry robots in 2019 (JETRO, 2021b).

More than anything, the Japanese automation industry resembles a Marshallian cluster. Japanese actors interact primarily with each other and co-operate through organisations such as JARA. Although there are very large players, such as Piab's direct competitor SMC, it is not dominated by or centred around any single company. The cluster is not centred around any specific university or government organisation, nor can it be defined as a satellite platform as the main companies are based in the cluster (Japan). According to Yoshie, the industry is not concentrated to any specific region of Japan, in other words it is a very sparse cluster.

Cluster Life Cycle

Driven largely by domestic demand, the automation industry in Japan developed as the country industrialised after the second world war. After the 1980s, facing tough competition first from Korea and then from China, it went into stagnation or even decline. However, in recent years the interviewees have experienced a revival, both in the competitiveness of established companies and an upswing in new ones. Taking all of this into account, the cluster is in a mature state, although it is growing.

Cultural Factors

Both interviewees describe the Japanese business culture as long-term oriented and relationship dependent. Change tends to happen slowly, as Japanese companies need time to build trust in new partners. The consequence is that in order to have engage with the Japanese industry, both when it comes to knowledge exchange and business transactions, one must be prepared to sustain continual contacts.

Yoshie says that Japan is somewhat introverted and not always open to or interested in foreign influences. Among other things, this takes the form of general scepticism towards foreign products and companies, which might hinder foreign companies from accessing the beneficial externalities of being present in a cluster. Another implication of this scepticism is that Japanese companies often chose to buy products from Japanese suppliers, despite foreign companies offering a superior product or price. Yoshie believes that this attitude is a little less prevalent in Tokyo than the rest of the country, as it receives a more influx of people and ideas from other parts of Japan and abroad. This makes Tokyo a convenient place to establish a foreign business.

Both interviewees mention that Japan is very technically oriented. *"They don't read the marketing brochures, they read the product manuals"*, Karbassi said to illustrate this attention to technical details.

5.2.4 Motives for Interaction

None of the interviewees worked for Piab during the 1990s when they established in Japan and therefore, it is difficult to know exactly what the motives were. However, both Karbassi and Yoshie argued that the primary motive of establishing in Japan was market seeking. Piab was in an expansive phase, and they knew that Japan was in the forefront regarding automation, so it was a good opportunity. Nevertheless, Karbassi mentioned that Piab has gained advantages related to asset seeking objectives, both from demand conditions as well as rivalry conditions, but that these are positive side effects of the establishment rather than original motives.

Demand Conditions

As stated earlier, the Japanese customers are very demanding with high quality standards. This is especially the case with larger firms such as Toyota which are famous for thorough and extensive quality inspections. An example of how Piab can benefit from this is when a product has passed Toyota's quality process, customers in China or Europe barely need to test it because the industry in general has a confidence in the Japanese standards. According to Piab's customers, it is essential that the products are reliable and function according to their specifications because the cost imposed by disruptions in the production is often significantly higher than the price of the components.

Rivalry Conditions

Drawing advantages from being located close to the competitors includes keeping track of what they are developing and what they are thinking. Employees from the Swedish headquarter travel to Japan regularly to visit the office, meet customers and attend exhibitions. The industry of automatic vacuum and grip equipment is growing in Japan and by following how the industry has developed in Japan, Piab has managed to develop these products and sell them to customers in Europe and the US. As an example, competitors in Japan were pioneers within gripping equipment for unpackaged food. The main part of Piab's business is gripping equipment for packed consumer goods but thanks to the knowledge gained from their rivals, they can target customers earlier in the supply chain, i.e. before the goods have been packaged.

In addition to product innovations, Karbassi mentioned that Piab has drawn inspiration from their competitors when it comes to strategy. As an example, SMC has been a role model when it comes to geographical and customer specific price differentiation.

5.2.5 Interaction Strategy

Interaction Mode

Piab started offering its products on the Japanese markets through a distributor in the 1980s. In the early 1990s, they wanted to increase their marketing efforts in order to capitalise on the market's perceived potential, but the distributor was unwilling or unable to increase their investments. Therefore, in 1993 Piab Japan was founded, jointly owned by a former employee of the distributor and Piab AB. Around 2005, Piab AB took over Piab Japan as a wholly owned subsidiary.

According to Karbassi, this method of increasing financial stakes in a distributor or spin-off was common for Piab as well as other Swedish companies in the 1990s, likely encouraged by the Swedish Export Council.

Activity Allocation

The Tokyo office has two main activities, sales and testing. The sales department includes salespeople and a back office which manages administration, logistics and translation to Japanese. The testing lab is used to confirm that Piab's systems are compatible with new applications, i.e. when a customer wants to use their systems to move something new. Karbassi mentioned that the lab has at times functioned as a proto-production facility, doing adaptations to local needs.

5.3 Case 2 – Ekkono

5.3.1 Background

Ekkono is a software company with 13 employees founded in 2016 and headquartered in Varberg. Their product is a Software Development Kit (SDK) which can be used to develop machine learning applications for connected things. Ekkono focuses on edge machine learning, which means that the algorithm runs onboard the connected thing using data from onboard sensors. The alternative, centralised machine learning, runs the algorithm centrally on data from multiple connected units, which requires less local computing power but faster and more stable connectivity (Ekkono, no date).

Despite being in the very early stages, the company has collaborated with multiple high profile companies including ABB, Husqvarna, Saft and Volvo. When looking for commercial partners, their focus has been on Scandinavia and DACH. In the future, the US, Japan and Korea are interesting markets as they have a large number of OEMs in interesting vertical markets[1].

Ekkono's interaction with Japan is an example of a remote interaction mode as they are not physically present in Japan. This report discusses both their relationship to the implementation partner Ubiquitous AI and their participation in the innovation acceleration program Plug and Play.

The interviewee, Jon Lindén, is CEO and co-founder of Ekkono. He has previous experience from starting multiple companies, most notably Procera Networks which was listed on the New York Stock Exchange in 2011.

All the following information is retrieved from the digital interview with Jon Lindén, CEO of Ekkono, the 7th of April 2021, if not stated otherwise.

5.3.2 Company Characteristics

Company Size

Ekkono has 13 employees in total, none of which are based in Japan. Sales in the country are virtually non-existent at the time being, as they only recently started pursuing Japanese customers.

Industry

Ekkono is a machine learning software company aiming to be a pure product company, using development partners for implementation and adaptation. In practice, however, they have provided implementation services to many of their first customers.

[1] Jon Lindén, CEO and co-founder of Ekkono, digital interview the 7th of April 2021

International Experience

Japan was one of the first countries that Ekkono started interacting with, but had established relationships to companies in Scandinavia, DACH and the US.

Lindén says that personal experiences had affected their choice of interaction mode, above all because he knows from experience how much time it takes to enter the Japanese market. This has convinced him to initiate this process early.

5.3.3 Cluster Characteristics

Cluster Type

Although Ekkono is a software company, what attracted them to Japan was primarily the automotive industry. Due to Varberg's relative proximity to the Gothenburg region, a cluster for Sweden's automotive industry, Ekkono had realised early on that it was a very promising vertical market for their product. Japan is the third largest automotive manufacturer in the world (JETRO, 2021b). The industry is centred primarily around three city regions: Nagoya (the largest agglomeration of automotive companies in the world), Tokyo and Hiroshima (Eriksson and Lundin, 2016).

Lindén's perception so far is that the industry is concentrated around Tokyo, but he says that specific location of their customers has not been important to Ekkono as they have only interacted remotely. According to Lindén, the Japanese automotive industry is successful today because it is dominated by conglomerates which are good at leveraging their size and avoiding diseconomies of scale. It is worth noting that despite this perceived dominance by conglomerates such as Toyota and Honda, two thirds of the employees in manufacturing work for SMEs (Eriksson and Lundin, 2016).

Due to Ekkono's remote and short relationship to Japanese industry, it is hard to distinguish from the interview what kind of cluster characterises the Japanese automotive industry. However, Markusen (1996) actually uses the cluster around Toyota outside Nagoya as a model example of a hub-and-spoke cluster, and other automobile clusters follow the same pattern (Jankowiak, 2011).

Cluster Life Cycle

According to Lindén, the Japanese automation industry is in a mature phase.

Cultural Factors

Lindén believes that Japan has a different culture around evaluating products compared to Sweden. In Sweden, the starting point of the evaluation is usually a specific problem, and the first step is to determine whether the product solves the problem. The next step is then to evaluate whether the product fulfils the technical demands that have been set up. Japanese customers, according to his experiences, tend to start by evaluating the technical demands before evaluating what problems the product can be used to solve. He does not think that either method is inherently more appropriate but changing from one perspective to another takes time getting used to.

5.3.4 Motives for Interaction

Ekkono's motive for interacting with Japan is market seeking. As described previously, they have identified the automobile market as one of the most important vertical markets, and it is natural to want to do business in some of the largest agglomerations of this industry in the world.

To this point, Lindén does not see that Ekkono has gained any of the advantages of interacting with a cluster that Porter describes.

5.3.5 Interaction Strategy

Interaction Mode

In August 2019, Ekkono entered an agreement with Ubiquitous AI to serve as a distributor and solution provider in the Japanese market. Ubiquitous AI serves both as a sales channel and provides the implementation service that most customers need in order to use the product efficiently. Ekkono collaborates closely with Ubiquitous AI and has frequent contact.

While at the CES trade show in Las Vegas, January 2020, Ekkono got introduced to Plug and Play, a company which organises corporate-start-up collaboration programs. Partially because the timing of the program was good, Ekkono applied to the 2020 mobility program in Tokyo, which included corporate partners such as Nissan, Suzuki and Denso (an automotive components manufacturer). Through the program, which started in June 2020 and lasted three months, Ekkono met with key people at Japanese corporations to discuss how their software could be used to make their products "smart". Lindén stated that the main advantage that Plug and Play provided was an initial contact with large companies that otherwise would take a very long time to build up. Having a local partner (Ubiquitous AI) proved very useful as language barriers were tricky to overcome despite the support of Plug and Play.

In the future, Ekkono plans to open a subsidiary in Japan with the primary purpose of overseeing and supporting solution providers. This, however, requires larger sales volumes to make sense.

Activity Allocation

Since Ekkono's interaction mode is purely remote, they have no activities allocated to Japan. The only activity which they have conducted remotely is sales, both directly to customers through the Plug and Play program and through Ubiquitous AI.

5.4 Case 3 – CELLINK

5.4.1 Background

CELLINK started as a bioprinting company in 2016 and was the first company to commercialise bioink (CELLINK, no date). Bioink is the input material used in bioprinters, machines which produce artificial live tissue in a similar fashion to a 3D printer. The products can be used to print body parts using human cells and are applicable to several areas including drug discovery, cosmetic testing and regenerative medicine (Japan External Trade Organization, 2020). In addition to the printers and bioink, CELLINK has a vision of combining engineering, biology, big data, and artificial intelligence within the life science sector in what they call bio-convergence. Example of customers are researchers at universities as well as pharmaceutical companies.

CELLINK has its headquarters in Gothenburg and is present in more than 65 countries with more than 600 employees and serve more than 1 800 laboratories (CELLINK, no date). In 2020, CELLINK's global revenue was around 40M USD[2].

The interviewee, Tomoko Bylund, is Director of Sales for the APAC region at CELLINK and is based at the HQ in Gothenburg but travels frequently all over APAC. She joined the company in 2017 as one of the first 15 employees and has overseen the commercial operations in Japan since they started. Originally from Japan, Ms. Bylund pursued her master's degree at Gothenburg University.

All the following information is retrieved from the digital interview with Tomoko Bylund, Sales Director of the APAC region, the 8th of April 2021, if not stated otherwise.

5.4.2 Company Characteristics

Company Size

CELLINK entered Japan in 2018 when they set up a representative office at Kyoto University Venture Incubation Centre. Of CELLINK's 600 employees, eight are situated in Japan at the office in Kyoto. The subsidiary in Japan accounted for around four percent of CELLINK's global revenue 2020.

Industry

The company is active within the bioprinting industry and is mainly a product company which sells 3D printers and biomaterial. Due to the novelty of the technology, they sometimes offer the customers application support as a service.

[2] Tomoko Bylund, Sales Director of APAC, digital interview the 8th of April 2021

International Experience

CELLINK has subsidiaries in six countries: Sweden, the US, Germany, France, United Kingdom and Japan. Some of these offices are started by CELLINK and some of them originates from acquisitions of daughter companies. In addition to CELLINK's own offices, they are active on the global market through several distributors.

Japan was the first country CELLINK entered after Sweden and the US. Bylund states in the interview that the establishment strategy for Japan was a combination of coincidence and previous experience. The interviewee, Tomoko Bylund, grew up in Japan and has experience from the Japanese business environment which made it easier to establish there. Bylund started to work for CELLINK in June 2017. Less than a year after Bylund started, CELLINK took the decision to establish an office in Kyoto. She says that her personal experiences from Japan might be one of the reasons why CELLINK entered Japan as early as they did.

5.4.3 Cluster Characteristics

Cluster Type

Kyoto is situated within the Kansai (also known as Kinki) region in western Japan. The whole Kansai region, especially Kyoto and Osaka, is prominent in biotech and pharmaceuticals. The region has a long history of medicine, staring when Osaka harbour became the point of import of Chinese medicine hundreds of years ago (Inagaki, 2018). The region hosts a mixture of old domestic giants (e.g. Ono Pharmaceutical and Mitsubishi Tanabe Pharma), regional headquarters of international companies (e.g. Bayer and AstraZeneca) and small university spin-offs (Inagaki, 2018).

Within this general pharma and biotech cluster, Kansai has recently become a leader specifically in regenerative medicine, a field which is closely related to bioprinting. Kyoto University and Osaka University are among the very best medical universities in Japan (US News, no date), and according to Ms. Bylund they are both global leaders in regenerative medicine. The most famous example is Professor Yamanaka of Kyoto University, who in 2012 received the Nobel Prize for his research on stem cells. Since then, multiple initiatives to facilitate industry-academia collaboration have started in Kansai and regulations have been eased, making the approval process for new regenerative treatments very fast (Nederlands Enterprise Agency, 2018; JETRO, 2021a). According to Ms. Bylund, Kyoto University and Osaka University have been good at encouraging researchers to commercialise their findings, and she says that these commercialisations is what drives the regenerative cluster in Kansai.

Taking the above description into account, the target cluster in this case is a state anchored cluster for regenerative medicine, centred around Kyoto and Osaka Universities. This cluster is co-located with, or placed within, a Marshallian life science cluster.

Cluster Life Cycle

As mentioned above, the Kansai region has been the country's pharmaceutical centre for hundreds of years. As a cluster for regenerative medicine, however, it is only in the last ten or so years that companies have started to form around Kyoto and Osaka Universitates. As such, it is probably best categorised as in the early growth stage of the cluster life cycle.

Cultural Factors

Ms. Bylund says that the corporate structure of Japan, e.g. the presence of keiretsu, did not affect CELLINK's establishment strategy. Moreover, she points out three cultural traits she has noticed in Japan and Kyoto: the importance of relationships, excessive bureaucracy, and a language barrier.

In contrast to Europe and the US, Japanese business is more dependent on relationships. In CELLINK's case, this means that they cannot sell directly to many labs as they only buy equipment through distributors which they have a long running relationship to. This forces CELLINK to use a middleman that would not have been necessary in other places, which might make it harder to build a relationship to the customers.

Despite help from JETRO, Ms. Bylund experiences that establishing a subsidiary in Japan involves a lot of bureaucracy which slows the process. For a small company with little administrative resources, this could make establishing a subsidiary a less compelling strategy.

Finally, there is a lack of bilingual and skilled staff in Kyoto, which makes it hard for international companies to operate here. This problem is prevalent all around Japan, but to a lesser degree in the Tokyo region.

5.4.4 Motives for Interaction

When CELLINK started to show their products to Japanese customers, the level of interest was high. However, the customers were sceptical, and few would commit and purchase the products. Even though the products were used by customers in the US and the technology seemed to work well, the Japanese customers demanded technical support in Japanese. Bylund argued that the scepticism could be relieved by locating native support staff in Japan. Therefore, CELLINK decided to establish their APAC sales and support office in Japan.

CELLINK also expected other advantages from setting up an office in the Kansai region and it was not a coincidence that they chose to establish the office in Kyoto. According to Ms. Bylund, Japanese scientists act as key opinion leaders in the APAC region, and being associated to institutions such as Kyoto University therefore signals credibility to customers all over the region.

In the interview, Ms. Bylund mentioned three asset seeking motives in terms of factor conditions, demand conditions and rivalry conditions.

Factor Conditions

One of the reasons why CELLINK decided to establish in the biomedical cluster in Kyoto was to access technically skilled staff. The staff is primarily employed as application specialists and have an important role in offering the customer scientific support. There is a resource pool of the demanded expertise in the Kansai region and Ms. Bylund provided an example where a PhD student to a researcher at Osaka University, who is one of CELLINK's customers, was hired as an application specialist after graduating. Today, all R&D activities are at the HQ in Gothenburg but if CELLINK decides to expand R&D to Japan, more of this expertise will be needed. Ms. Bylund stated that this is not an unlikely scenario in the long run.

Demand Conditions

A lot of research relevant to CELLINK's business is going on in the Kansai region. CELLINK works closely with its customers, often researchers at prominent universities, and the input provided by them is utilised in the development of new products. For example, CELLINK has developed printers with better temperature control, additional printer heads and interchangeable parts as a result of demands from the researchers in the Kansai region.

Because CELLINK works so closely with its customers, they have a unique insight into research which is very relevant to their own field. In the future, CELLINK hopes that this position will allow them to identify important discoveries and partner with their customers in the commercialisation.

Rivalry Conditions

There are Japanese companies doing similar things as CELLINK and they saw the establishment in Kyoto as a learning opportunity when monitoring these companies. However, so far, Ms. Bylund argued that CELLINK has not encountered as much competition as they anticipated.

5.4.5 Interaction Strategy

Interaction Mode

When Ms. Bylund joined CELLINK in 2017, they had a collaboration with Business Region Gothenburg. It is an organisation aiming to assist local companies to expand globally. Business Region Gothenburg worked together with Business Sweden in Japan, who invited CELLINK to a convention in Tokyo named BioJapan where they could present their technology for Japanese actors. After BioJapan 2017, Kyoto University contacted CELLINK and offered them to join their incubation centre. Ms. Bylund said it was obvious for CELLNIK to accept the offer because Kyoto University is the best medicine university in Japan.

CELLINK moved to the office at Kyoto University in February 2018. After a while, CELLINK outgrew the desk space at the incubation centre and had to move. With the help of Kyoto University, they found a facility just outside the university in another bio-venture facility sponsored by the government. In February 2020, CELLINK established its Japanese subsidiary in order to be able to rent office space outside of the incubator. Despite receiving administrative support from

JETRO, including consultation about company registration and tax matters, this process was very time consuming.

Ms. Bylund expressed in the interview that the most common establishment strategy for companies in Kyoto is to go through a distributor. When signing a contract with a distributor, they will take care of several activities such as marketing, sales, after sales support and practical parts like importing the products and invoicing. This could be very advantageous but at the same time, the company loses control of its business when assigning these tasks to the distributor. An additional challenge with distributors is that it becomes difficult to create brand awareness because the brand is hidden by the distributor's brand. Creating brand awareness is very important for CELLINK as they want to become the world-leading bio-convergence company, and Ms. Bylund says that this was one of the reasons why they wanted to do direct sales.

Activity Allocation

The main function of CELLINK's Kyoto office is technical and application support, which serves the whole APAC region. Application support means that CELLINK offers scientific support, in other words they assist their customers not only on how their products function technically, but also how to use them to conduct research. In addition, it has a sales function, working both directly towards customers and through distributors.

As mentioned, CELLINK has hopes of commercialising new discoveries in partnership with their customers, in which case they would likely expand their activities in Kyoto to R&D as well.

5.5 Case 4 – SECO Tools

5.5.1 Background

SECO Tools (henceforth: Seco) offers metal cutting solutions for stationary tools, milling, hole making and tooling systems (SECO, no date). In addition to their product portfolio of cutting tools, Seco also develops and provides technologies and processes for manufacturers which want to increase their productivity (SECO, no date). Seco has its headquarters in Fagersta, Sweden, and is active in more than 75 countries with around 4100 employees globally (SECO, no date). Moreover, Seco is part of the Swedish company Sandvik Group's tooling business called Sandvik Manufacturing and Machining Solutions.

Seco has offices in both Tokyo and Nagoya, however the object under study will be their activities in Nagoya.

Sammy Tsuruhisa is Managing Director of Seco Tools Japan and is based in the Japan headquarters in Tokyo. Tsuruhisa joined the company in 2017 but has extensive experience since he has been working within the cutting tool business for the past 25 years. He has been working for one of Seco's distributors, for an equipment manufacturer as well as been responsible for the import and export of industrial tools for the global market.

All the following information is retrieved from the digital interview with Sammy Tsuruhisa, Managing Director of Seco Tools Japan, the 13th of April 2021, if not stated otherwise.

5.5.2 Company Characteristics

Company Size

Seco established in Japan in 1976 and has one office in Tokyo and one in Nagoya. In total, Seco has 27 employees split between the main office in Tokyo and three regional sales teams. The office in Tokyo has 14 employees and the office in Nagoya has six employees. Four respective three employees are working for the eastern region and the western region.

Sandvik does not disclose revenue numbers for individual business units such as Seco, but Tsuruhisa says that Japan is a medium sized market. In 2020, the manufacturing and machining solutions division of Sandvik, which Seco belongs to, reported 21% of 2020 sales in Asia (Sandvik Group, 2021). Country specific numbers are not presented on division level.

Industry

Seco is active in the machine tool industry and is mainly a product company which uses services to differentiate themselves from its competitors. Tsuruhisa explained in the interview that Seco's customers can be divided into three different segments where one of the segments is price-oriented and purchase products according to specifications without service needs. On the contrary, the other two segments usually need consultation and support to select the right tools for their

production and suggestions on how they can improve their productivity. In other words, Seco uses services mainly as a differentiation tool.

International Experience

Tsuruhisa could neither answer what experiences of international affairs Seco had before establishing in Japan, nor whether personal experiences affected the choice of establishment strategy.

5.5.3 Cluster Characteristics

Cluster Type

Tsuruhisa explained in the interview that Nagoya is Japan's fourth biggest city and situated in the central region of Japan. The city is nowadays associated with machine tool trading companies and large manufacturing companies. However, this has not always been the case and Nagoya emerged as the most prominent industry city during the late 1980s and early 1990s. Apart from machine tools, there are a lot of companies within the automotive industry and the aviation industry. The heavy industries have required well-developed infrastructure and Nagoya hosts a large seaport as well as an airport.

Around 100 years ago, the central region of Japan was farmland, and the eastern region was considered as the top industry region. In the interview, Tsuruhisa provided several factors that have transitioned Nagoya to the centre of industrial factories for the mentioned industries. The first factor is related to the aviation industry. The aviation industry boomed around the 1930s, when Mitsubishi manufactured aircrafts for the World War 2. Mitsubishi's large manufacturing plant in Nagoya has helped to develop the industry cluster.

The second important factor is related to the automotive industry and Tsuruhisa explained that Toyota has had a big impact on Nagoya's development. Toyota started its business in the central region of Japan, close to Nagoya, and still has production there. One of their competitors, Nissan, has their production in the eastern region. Some decades ago, Toyota started to export their cars to the US and grew rapidly while Nissan could not follow the growth. Tsuruhisa argued that Toyota's growth was one of the reasons behind the transition of the industry centre from the eastern region to the central region.

The third factor which might have affected the region's growth is related to the machine tool industry. Tsuruhisa said that China's journey to be a leading manufacturing country led to heavy investments in Japanese machine manufacturers. The machines required tools which in turn affected the machine tool trading companies. This further stimulated the growth of Nagoya as an industrial centre.

Tsuruhisa mentioned that there are many large-scale companies in Nagoya compared to the western and the eastern region of Japan, including Toyota, Mitsubishi, Kawasaki and Fuji. He does not emphasise any of these companies as more important than the others. As mentioned previously, Markusen (1996) uses Toyota as the model example of a hub-and-spoke cluster. Taking all the above into consideration, the authors identify the cluster as a number of partially overlapping hub-

and-spoke structures. The large-scale companies act as independent hubs while the spokes, the smaller supplying companies, might be part of multiple hub-and-spoke networks.

Cluster Life Cycle

Tsuruhisa argued that the number of metal cutting tool distributors grew rapidly from the end of the World War 2 until the mid-1970s. Moreover, Nagoya as a region has been the top industry region for decades and grew rapidly during the 1970s. There are many large manufacturers, together with tool distributors, in the region and there are not any indications of decline. In other words, the cluster is in the mature phase.

Cultural Factors

In the interview, cultural factors were not discussed in depth, and therefore Tsuruhisa answered, by email, questions about the main aspects of culture identified in other interviews.

Regarding language barriers, he thinks that Nagoya has relatively few English speakers, compared to Japan in general. He says that relationships are important for business in Nagoya, but doesn't specify whether it is more important than in other parts of Japan. Regarding scepticism towards foreignness, his experience is that European and US brands generally have good reputation, but that other foreign brands are less trusted.

5.5.4 Motives for Interaction

Seco established in Japan in 1976 and Tsuruhisa could not answer what the motive for establishing in Japan was. However, he mentioned that the first office location was Tokyo and the reasons behind it was convenience.

Seco's motive for interacting with Nagoya is strictly market seeking. As the Nagoya cluster contains so many important customers for Seco, they have established a sales office there. The sales office in Nagoya is beneficial for physical meetings with the regional customers. Seco used to have a showroom with tools in the office to show the customers the products but now it is easier to show them digitally. Despite this, it still helps to be able to meet the customers physically.

5.5.5 Interaction Strategy

Interaction Mode

Seco's establishment strategy started with distributors who sold the products in Japan. In 1976, they decided to start a subsidiary and located the headquarters in Tokyo due to convenience. Tsuruhisa explained that from the time Seco entered Japan until around 2005, the president was a foreigner, and it was easier to arrange housing and education for foreigners in Tokyo than in smaller cities. Tsuruhisa said that the foreign employees did not come alone, they brought their families and the only city with international schools was Tokyo. Furthermore, he argued that an additional important aspect why the HQ is in Tokyo is that living in Tokyo is a status symbol for

Europeans, which made it easier to attract foreign employees for management positions. Aspects such as nightlife and well-developed infrastructure were important as well.

Only a few years after their establishment in Tokyo, Seco decided to establish a sales office in Nagoya, due to the high concentration of customers there. Today, the APAC regional manager wants Seco Japan to move its HQ from Tokyo to Nagoya, because it is such an important market and he believes that establishing there would have positive effect on Seco's market penetration. However, Tsuruhisa wants to keep the office in Tokyo because he believes the central region has a tricky culture and poor infrastructure, compared to Tokyo. If needed, it is possible to travel from Tokyo to Nagoya in 90 minutes with the high-speed trains which makes it unnecessary to move the HQ, in his opinion.

Activity Allocation

The office in Tokyo is the HQ and handles most of the activities such as administration, finance, IT and customer support. The office in Nagoya is a pure sales office responsible for the central region of Japan and is mostly used for sales meetings with customers because it is located close to several toolmakers' offices.

5.6 Case 5 – Mycronic

5.6.1 Background

Mycronic builds electronics production solutions and sells primarily to companies within SMT (Surface Mount-Technology), automotive and semiconductor industry (Mycronic, no date). The company is divided into four divisions: Pattern Generators, assembly solutions High Flex, assembly solutions High Volume and assembly solutions Global Technologies. Mycronic is a leading supplier of laser-based mask writers which are sold to the semiconductor industry.

Mycronic has its headquarters in Täby, Sweden, but are active on the global market through subsidiaries. They have around 1500 employees globally (Mycronic, 2021).

The interview focused on how Mycronic acquired Kyushu Next Engineering (henceforth: KNE) and integrated it with Mycronic to become MFKK and thereby, established presence in Fukuoka. KNE was a product development consultancy firm which Mycronic had hired before the acquisition, and were active within the electronics business where they developed similar products as Mycronic[3].

Per Dahlberg handled the acquisition of KNE as M&A Integration Manager and has been working with industrialisation and mergers for Mycronic for six years. Dahlberg has previously worked with industrialisation and mergers of acquired companies within the telecom industry.

All the following information is retrieved from the digital interview with Per Dahlberg, earlier M&A Integration Manager at Mycronic, the 16th of April 2021, if not stated otherwise.

5.6.2 Company Characteristics

Company Size

Mycronic established a subsidiary in Japan in 1997 and has one office in Tokyo with around 20 employees and one office in Fukuoka with 35 employees. The Tokyo office is the headquarter in Japan while the facility in Fukuoka is a result of acquiring KNE. Dahlberg could not provide a revenue share for the Japanese market.

Industry

Mycronic is active within the electronics manufacturing industry and is mainly a product company. However, due to the complexity of division pattern generator, service contracts are one of the profit generators for that product range. This contrasts Mycronic from other companies in this case studies, as the other companies generally only provide services as a means of differentiating or as an order qualifier.

[3] Per Dahlberg, earlier M&A Integration Manager at Mycronic, digital interview the 16th of April 2021

International Experience

Mycronic had subsidiaries in several other countries before they established in Japan which indicates that they had international experience.

Moreover, Dahlberg stated that personal experiences might have affected the decision to acquire KNE. Mycronic's first point of contact with KNE was through the previous Strategic Portfolio Manager, whose job is to manage acquisitions. Had the first contact been through someone else, it might not have been as obvious to Mycronic that KNE was both a potential partner and acquisition target.

5.6.3 Cluster Characteristics

Cluster Type

Dahlberg said that he had little insight into Fukuoka as a cluster and could not provide any information on this. One thing he mentioned was that KNE had experience working as consultancy company with Panasonic, a competitor to Mycronic which is headquartered in Osaka but has a major facility in Fukuoka.

Fukuoka is Japans sixth largest city and the main economic centre of the island Kyushu, located in southwestern Japan. For a sense of scale, greater Fukuoka has a population of 5 million and Kyushu as a whole has an economy roughly the size of Sweden (JETRO, 2020). Long known as the "Silicon Island", in 2005 Kyushu boasted one of the largest agglomerations of semiconductor manufacturers in Japan, and a concentration of semiconductor research which was the second largest in the country (Kitagawa, 2005). According to SEMI, the global industry organisation for the semiconductor and electronics industry, Kyushu became a cluster because tax breaks and government initiatives made it a cost-effective manufacturing base (Yao, 2018). Materials and equipment suppliers emerged around the new plants, and today Kyushu has a very strong local supply chain for electronics manufacturing and remains research intensive (Yao, 2018). Examples of companies with large plants are Sony, Mitsubishi and AKM (SIIQ, 2017).

Categorising the cluster is difficult based on these secondary sources. It seems that in the beginning, Kyushu was mostly a cost-competitive satellite platform. However, based on the accounts mentioned above it seems that what drives Kyushu's competitiveness today is rather a concertation of knowledge and a strong local supply chain. It is therefore more likely that the Kyushu electronics cluster is either Marshallian or a hub-and-spoke system centred around large manufacturers present on the island.

Cluster Life Cycle

Dahlberg could not provide any information regarding Fukuoka's stage in the Cluster Life Cycle. From an article published by SEMI, it seems that the cluster is in the mature phase (Yao, 2018).

Cultural Factors

Dahlberg emphasises language barriers and a traditional mindset as two important cultural factors when doing business in Fukuoka. Many of the locals understand English well but are too shy to speak and Mycronic needed to use an interpreter. Before the acquisition, KNE did only have Japanese employees, and therefore all the material was in Japanese which made it extremely difficult to access certain documentation. Moreover, it was virtually impossible to find professional interpreters in Kyushu which made it even more complicated.

The traditional mindset affects Mycronic's business in several ways. Firstly, in Kyushu, the citizens take great responsibility of each other. When you as employer hire a person, you make sure that the employment is lifelong. Employers need to show loyalty to their employees but at the same time, the employees show loyalty to their employers, and it is rare to switch company as often people do in Sweden. An additional factor, according to Dahlberg, is that Japanese companies prefer to buy from other national firms. One of the main reasons that Mycronic has kept production in Fukuoka is that KNE had designed the product to be built using domestic suppliers, and that exporting these parts would be very expensive. In the most extreme cases, local suppliers refused to sell components to KNE after it was acquired by Mycronic. Mycronic had to overcome this hinder by hiring decoys who purchased the components for them.

5.6.4 Motives for Interaction

Dahlberg stated in the interview that the main motive for interaction was to utilise the skilled labour of KNE which is a form of asset seeking, but there were also knowledge seeking motives in terms of supplier conditions. Dahlberg's personal intention was to keep the development of the new product in Fukuoka, but he investigated in an early stage the possibility to move production to China. However, manufacturing ultimately remained in Fukuoka due to supplier conditions.

Factor Conditions

Access to skilled labour, a factor condition, was the main reason why Mycronic acquired KNE. Mycronic had considered developing a new version of their jet printer MY600, but felt that they lacked the technical competence to significantly improve it. They hired KNE to develop the new version, but also included the option to buy the company in order to make sure that knowledge about how to service and further develop the product was kept within the company. They wanted to own the product design, but they also wanted to "own" the human resources which had created it in the first place. The staff which Mycronic took over from KNE has continued to develop the new jet printer, e.g. by designing adapted versions for special use cases.

Supplier Conditions

Dahlberg stated that Mycronic decided to keep the production in Fukuoka, despite the initial investigation to move it. Three aspects are related to the product development process. Firstly, KNE had developed the product based on rare components from Japanese suppliers which were difficult to source from other companies. Due to expensive duties for Japanese export, it was not an option to move the manufacturing to China and import the components from Japanese suppliers.

Secondly, countries use different metric standards in the product development process. In worst case, if the product design is based on an unusual metric standard, it is impossible to switch supplier without redesigning the product. Thirdly, all documentation and specifications from the development process were in Japanese which made it difficult to set up production in China. Nevertheless, Dahlberg said that it would have been possible to adjust and manufacture the product with other components, especially if this idea had been implemented earlier in the design process.

The strong connection between KNE and the company which the manufacturing was outsourced to, also affected the decision to keep the activities in Fukuoka. Dahlberg argued that the Japanese culture values relationships and therefore, it was necessary to begin the manufacturing in Fukuoka, regardless earlier plans to move the production.

5.6.5 Interaction Strategy

Interaction Mode

The interaction mode used by Mycronic was a development contract, including an option to acquire the company after around two years. When KNE was acquired, they changed name to MFKK because the owner of KNE wanted to keep his consultancy firm under its current name. Before the acquisition, Mycronic set up a process defining how KNE should be integrated where all workstreams such as HR, finance, operations and R&D needed to be involved. This was crucial because the acquisition implied new routines and business systems for KNE.

Dahlberg argued that a success factor for the integration was the support from the CEO of KNE. As mentioned earlier, the Japanese employees are loyal to their manager and it was a challenge to explain to them that it was more advantageous for them to join Mycronic. The manager had to convince the employees to accept the acquisition and join Mycronic, which most of them did but not everyone. Some employees were so loyal to their manager that they refused to transfer to Mycronic.

According to Dahlberg, Mycronic could have chosen to interact through a joint venture instead of the full acquisition and that it might have been an even better option to reduce the risks. However, Dahlberg stated that the acquisition and outcome was successful.

Activity Allocation

The office in Fukuoka, the focus area for the interview, is mainly a development office. There are also two to three people responsible for managing the manufacturing which is locally outsourced.

On the other hand, the Tokyo office is a sales office with service support, both for Mycronic's global product portfolio and for the newly developed product from Fukuoka.

5.7 Case 6 – Autoliv

5.7.1 Background

Autoliv is a vehicle safety system company which produces seat belts, airbags and steering wheels. Originally founded in Vårgårda, north-west of Gothenburg, it is currently headquartered in Stockholm and has operations in 27 countries (Autoliv, no date). With 42% global market share, Autoliv is the definitive market leader, and sells to all major car manufacturers. (Autoliv, no date). Autoliv's assembly plants are typically placed in proximity to customers, so production and deliveries can be synced to the customers' needs (Autoliv, no date).

This case report is focused on Autoliv's facility in Tsukuba, which is a technological development centre and manufacturing plant. Before establishing in Tsukuba, Autoliv already had activities in Japan.

The interviewee is a key executive based in Tsukuba, Japan, who has asked to remain anonymous. He has been at Autoliv for more than 25 years, holding multiple roles primarily in R&D but also sales and business development.

All the following information is retrieved from the digital interview on the 19th of April 2021, if not stated otherwise.

5.7.2 Company Characteristics

Company Size

Autoliv has about 68 000 employees globally, 2250 of which are located in Japan (Autoliv, 2021). Of these, about half are located in Tsukuba while the other half is spread around four other facilities and three sales offices in Nagoya, Yokohama (southern Tokyo) and Hiroshima.

The Japanese market constitutes around 10% of global sales (Autoliv, 2021), but the interviewee says that about 30% of global sales are made to Japanese customers which have some of their production abroad. As these customers make most of their key design and business decisions in Japan, a large part of global sales is dependent on the decisions made in Japan, although the products end up being sold and shipped to assembly plants abroad.

Industry

Autoliv is a product company within the automotive safety industry. They offer certain services to their customers, but these are mostly order qualifiers and do not constitute a significant share of revenue.

International Experience

Before establishing in Japan, Autoliv already had operations in major European markets as well as the US. When establishing in Tsukuba, Autoliv was an international company with subsidiaries and joint ventures in every region of the world.

The interviewee does not have full insight into whether personal experiences affected Autoliv's establishment in Tsukuba. However, around the time of establishment, Autoliv had acquired an American airbag company which had an employee who had spent much time in Japan and spoke the language. He believes that this might have helped Autoliv in establishing more activities than pure sales function in Japan.

5.7.3 Cluster Characteristics

Cluster Type

Tsukuba is a small city located roughly 60 km northeast of Tokyo, which, according to the interviewee, is not a significant centre for the automotive industry. Instead, it is most known in Japan for the Tsukuba Science City. Tsukuba Science City originated as part of a 1960s government project with the aim of decongesting Tokyo by relocating national research facilities (Tsukuba University, no date). Today, more than 30% of national research institutes are located in the city (Tsukuba University, no date), as well as Tsukuba University which is considered one of Japans best according to the interviewee. One in ten inhabitants of the city is a researcher (Tsukuba University, no date).

According to the interviewee, Tsukuba attracts companies because the national research centres provide guidance and facilities that makes it easy to conduct R&D here. Tsukuba's reputation as a science city also means that it is easier to attract technically skilled staff from other parts of the country, and the fact that so many researchers live in the city makes for a great labour pool. Although Autoliv has started to experiment with open innovation initiatives, most companies in Tsukuba do not interact much with each other, but rather with the research centres. The interviewee mentions that Tsukuba is not as attractive for newer, digital technologies, and that especially Tokyo has more companies and talent in that sector.

From the description of Tsukuba as an almost artificial city which emerged because of the proximity to national research centres and a national university, the cluster can be defined as state anchored. In fact, Markusen uses Tsukuba as an example of a state anchored cluster in her paper. It is worth noting, however, that Tsukuba also in many ways resemble the R&D oriented satellite platforms Markusen describes.

Cluster Life Cycle

According to the interviewee, Tsukuba Science City really took off in the 1980s and has matured since. However, he argues that the cluster is by no means in decline, mentioning the recent discussions of establishment of a semiconductor company from Taiwan as one example.

Cultural Factors

Culturally, the interviewee believes that Tsukuba is less traditional and more open-minded than many other parts of Japan. Because it attracts people from all parts of the country, as well as many foreigners, local cultures become blended and less important, he says. He also mentions that more

people are bilingual in Tsukuba than in other parts of Japan, even more than in Tokyo. These two factors have made it easier for Autoliv as a foreign company to establish here, as foreigners find it much easier to work here than in most places. He adds, however, that even in Tsukuba the language barrier is still a great obstacle.

5.7.4 Motives for Interaction

The interviewee joined Autoliv around the time that they established in Tsukuba but does not have full insight in what motivated the establishment. However, he can comment of the benefits of being present in Tsukuba that Autoliv has today.

Apart from the asset seeking motives discussed below, the interviewee says that a great benefit of having production and technical centres in Japan is that it signals a commitment to the Japanese society which is valued by customers. He says that Japanese companies prefer to do business with other Japanese companies, and that Autoliv must "become more Japanese" in order to gain their trust. Establishing more than just a sales office is a good way of achieving this.

Factor Conditions

For Autoliv, the two main factor advantages in Tsukuba have been access to an advanced workforce and to research infrastructure.

As mentioned in the previous section, Tsukuba facilitates hiring advanced staff in two ways. Most obviously, the research intensity in the city means that a very large portion of the workforce is highly trained technically. A more subtle benefit is that Tsukuba's reputation in Japan as a science city makes it natural for someone to move to Tsukuba to work for a technology company like Autoliv, according to the interviewee's perception. This has made it easier to attract the right kind of employees from other places in Japan as well.

The second factor condition is that the national research centres make it easier to conduct development work. The centres provide infrastructure that is used by companies in multiple different fields, which creates scale economies for everyone located there.

Demand Conditions

As mentioned in the background, Japanese car manufacturers make key design and business decisions in Japan, and as such it is an important market. Tsukuba is not a centre for the automobile industry, but some significant customers such as Nissan, Honda and Subaru are located relatively close. The two main demand condition advantages Autoliv has gained from operating in Tsukuba are improvements both to their production efficiency and product design.

Autoliv's customers in Japan, e.g. Toyota and Nissan, are world-renown for their production efficiency and quality. They have very high standards both on their suppliers' quality and way of working. As a key supplier, Autoliv has on multiple occasions been visited by their customers which have reviewed and proposed improvements to their manufacturing operations. This knowledge has then been implemented not only in Autoliv's Japanese manufacturing plants, but globally.

Secondly, working close to Japanese car manufacturers as they design new models has helped Autoliv to develop new solutions. For example, key airbag component such as inflators and retractors have been deeply scrutinised by Japanese customers, leading to improvements. Many of the product innovations developed together with Japanese customers have later been implemented and sold globally, which has strengthened Autoliv in other markets.

Rivalry Conditions

Autoliv's main rivals in Japan are located in the Nagoya area, so Tsukuba is not a great location for learning from or sharing resources with them. However, through communication with their customers they can still get insight into what competitors are doing differently and draw advantage of this.

An interesting aspect the interviewee mentions is that the automobile industry is heavily influenced by keiretsu. For example, Autoliv's main competitor in Japan is part of the Toyota keiretsu. This makes it very hard for Autoliv to compete with domestic companies even if they provide better quality or price. The hidden benefit of this, says the interviewee, is that it has forced Autoliv to think hard about how they can differentiate their products, and what they can offer the customers that is significant enough to "break into" the keiretsu. In this way, tough domestic competition has forced Autoliv to develop even better products, increasing their competitiveness in the long run.

5.7.5 Interaction Strategy

Interaction Mode

Towards the end of the 1990s, Autoliv started to look for a suitable acquisition target in the Tsukuba area. In 1998, they acquired Sensor Technology Co., an airbag component company with production facilities in Tsukuba supplying Mazda, Nissan and Mitsubishi, among others (Couretas, 1997). The company was integrated into Autoliv and managed as a subsidiary rather than a separate company.

According to the interviewee, acquiring a company was favourable to a greenfield investment mainly because it made it easier to access good staff and customer relationships. He says that since Japanese employees tend to be loyal to their employers, it is very time consuming to build a large operation from scratch. The same thing is true about Japanese customers, who rarely change suppliers since they value the personal relationship they have built with them. By acquiring a company, the interviewee says, one can quickly get access to their staff and in turn their relationships to customers. This is not as important when establishing small sales offices like the ones in Nagoya, Yokohama and Hiroshima, but is crucial when building production or technical capabilities, he believes.

The interviewee mentions that Autoliv has carried out multiple similar acquisitions in Japan, and that this strategy is common among other foreign companies. However, acquisition targets are often hesitant to sell to foreign investors.

Activity Allocation

The Tsukuba facility has production and development of airbags and seatbelts. Nagoya, Yokohama and Hiroshima have sales offices. Autoliv also has smaller production facilities in proximity to Nagoya, Yokohama and Hiroshima.

5.8 Case 7 – Sandvik Coromant

5.8.1 Background

Sandvik Coromant (henceforth: Coromant) is the world leading machine tool manufacturer with 7600 employees and presence in 150 markets, headquartered in Sandviken (Sandvik Coromant, no date). Like SECO, it is one of multiple brands which operate independently under ownership of Sandvik Group (Sandvik Group, no date). Coromant's main products and vertical markets are turning, milling and drilling tools for the general engineering, automotive, aerospace and energy industries (Sandvik Group, 2021). They sell directly to manufacturers, but also through machine tool companies which utilise their products as components in larger systems.[4]

This case report is mainly focused on Coromant's establishment in Nagoya, where its HQ has been located since 2008. Before this, Coromant's offices in Japan were co-located with Sandvik Group's in Kobe, including a sales office in Nagoya which opened in 1968.

Masahiro Yamamoto is the country manager of Coromant Japan and General Manager for APAC. Before this, he spent over 25 years in various divisions of Sandvik Japan, working mostly in sales roles and most recently as President of the Materials Technology division. He has studied Business Administration at Kansai University, and participated in International Executive Education at the Stockholm School of Economics.

All the following information is retrieved from the digital interview with Masahiro Yamamoto, Country Manager Japan and GM APAC, the 23rd of April 2021, if not stated otherwise.

5.8.2 Company Characteristics

Company Size

Coromant has 7600 employees globally, of which 500 are in Japan. Yamamoto cannot provide a more precise breakdown between locations in Japan.

Yamamoto cannot disclose revenue numbers for individual business units (e.g. Coromant) but says that Japan is an important market and one of the biggest markets globally. In 2020, the manufacturing and machining solutions division, which Coromant belongs to, reported 21% of 2020 sales in Asia (Sandvik Group, 2021). Country specific numbers are not presented on division level.

In Nagoya, Coromant has located sales, sales operations, pricing, marketing and a productivity centre which supports customers. Coromant also has a production facility in Semine, which is three hours north of Tokyo by train.

[4] Masahiro Yamamoto, Country Manager Japan and GM APAC, digital interview the 23rd of April 2021

Industry

Coromant belongs to the machine tools and tooling system industry. Like Seco, it is mainly a product company but utilises services to differentiate. This is especially important in the premium segment.

International Experience

Japan was one of the first Asian markets Sandvik established contact with, starting with sales of speciality steels through distributors in the 1930s. By the time that Coromant moved their HQ to Nagoya, they had decades of international experience, including in Japan.

Yamamoto does not think that personal experiences affected the decision to move the HQ to Nagoya, nor to establish a sales office there.

5.8.3 Cluster Characteristics

Cluster Type

According to Yamamoto, Nagoya has long been the manufacturing centre of Japan. Among the reasons for this, he mentions the central location in the country and the presence of Toyota. Among the main industries in Nagoya are automotive, aerospace and machine tool manufacturers, which are also important vertical markets for Coromant. He mentions that Nagoya University is a prominent engineering school and a useful to resource to Nagoya's industry, but the cluster is not centred around it.

According to Yamamoto, Nagoya is dominated by a few giant corporations including Toyota, Mitsubishi and Kawasaki Heavy Industries. These companies rely on smaller subcontractors, which are great in numbers but are rarely very influential. As mentioned previously, Markusen (1996) uses Toyota as the model example of hub-and-spoke clusters. From Yamamoto's description it seems that Nagoya is made up of multiple, overlapping hub-and-spoke structures. The smaller subcontractors might be part of multiple hub-and-spoke networks, while the hubs act independently, which results in an overlap.

Cluster Life Cycle

According to Yamamoto, Nagoya emerged as a manufacturing centre more than a hundred years ago and is today a mature cluster.

Cultural Factors

According to Yamamoto, Nagoya is more conservative than larger cities such as Osaka and Tokyo. He emphasises that business is very dependent on relationships and that the conservativeness manifests itself in that relationships take even longer to build. Yamamoto thinks this has to do with the fact that the manufacturing industry is very dominated by keiretsu such as the Toyota, Mitsubishi and Kawasaki spheres. This culture means that it is harder to penetrate the local market,

and also makes a physical proximity to customers more important as it increases the possibility to build important relationships.

Yamamoto also mentions that bilingualism is more common in Osaka and Tokyo than in Nagoya.

5.8.4 Motives for Interaction

The main motivation for moving the Coromant HQ to Nagoya was to get proximity to key customers, who are more abundant in Nagoya than anywhere else in Japan. By establishing the HQ in Nagoya, Coromant hoped to signal commitment to the region, establish closer relationships to customers and build brand awareness. Apart from this market seeking motive, Coromant also considered factor and demand conditions.

Factor Conditions

According to Yamamoto, Nagoya does have a good talent pool thanks to Nagoya University. However, as a foreign company it is very hard to compete for the best talent as Coromant lacks both the brand awareness and exciting domestic opportunities that large Japanese companies can offer.

The labour pool at large is also excellent, but Yamamoto says that people very rarely change employers, especially to competitors as anti-competition clauses are very common in employment agreements.

Demand Conditions

Yamamoto also mentioned that the proximity to customer has made it easier to properly understand customer needs and adapt the products accordingly. He thinks that this happens more easily because their HQ is established close to the customers, but that much of the benefits would still be achieved my having a sales office in Nagoya as was the case before the HQ moved.

5.8.5 Interaction Strategy

Interaction Mode

Before establishing a separate HQ in 2008 Nagoya, Coromant's activities in Japan were co-located with those of Sandvik Group. Sandvik started selling their products in Japan through distributors in the 1930s and established a subsidiary with offices in Tokyo and Osaka in 1961. In 1966, Sandvik moved its Japanese HQ from Tokyo to Kobe and in 1968 established a sales office in Nagoya. In 1976, Sandvik Coromant established their production facility in Semine.

In 2008, Coromant established a separate HQ in Nagoya, driven by the motives discussed above. The Sandvik HQ is still situated in Kobe.

Activity Allocation

Coromant's Nagoya office have activities such as sales, sales operation, pricing, marketing, productivity centre, HR and administration, whereas the office in Semine is responsible for production and reconditioning centre.

Sandvik Group's office in Kobe holds activities as finance, accounting, legal and compliance.

5.9 Summary of Results

Table 5.1: Summary of Company Characteristics.

	Piab	*Ekkono*	*CELLINK*	*SECO*	*Mycronic*	*Autoliv*	*Coromant*
				Company Size			
Employees, Globally	650	13	600	4 100	1 500	68 000	7 600
Employees, Cluster (Japan)	9	0	8	6 (27)	35 (55)	1000 (2250)	No info (500)
Share of revenue in Japan	A few percent (not disclosed)	Negligible	4 %	Not disclosed	Not disclosed	10% (30% of decisions)	Not disclosed
				Industry			
Industry	Manufacturing Automation	Machine Learning Software	Bioprinting	Machine tools	Electronics manufacturing	Automotive safety	Machine tools
Service or Product company	Product	Product	Product, some application services	Product, service differentiation	Mix	Product	Product, service differentiation
				International Experience			
Company	Extensive	Limited	Limited	No info	Extensive	Extensive	Extensive
Management	No info	Earlier experience convinced them to initiate establishment early	Japanese born employee made establishment more attractive	No indication	Portfolio Manager more likely to acquire a company	Japanese speaking employee made establishment more feasible	No indication

Table 5.2: Summary of Cluster Characteristics.

	Piab	*Ekkono*	*CELLINK*	*SECO*	*Mycronic*	*Autoliv*	*Coromant*
Cluster Location	Japan generally	Multiple locations	Kansai region	Nagoya	Kyushu Island	Tsukuba	Nagoya
Cluster Type	Marshallian	Hub-and-Spoke	State Anchored in Marshallian	Hub-and-Spoke	Marshallian or Hub-and-Spoke	State Anchored	Hub-and-Spoke
Life Cycle	Mature	Mature	Growth	Mature	Mature	Mature	Mature
Cultural Factors	- Long-term orientation - Scepticism towards foreignness - Technical orientation - Language barrier	- Technical orientation	- Relationships important - Excessive bureaucracy - Language barrier	- Language barrier - Relationships important - No scepticism towards EU/US	- Language barrier - Extreme scepticism towards foreign companies	- Less traditional than most of Japan - More bilingual than even Tokyo	- Relationships important - Language barrier
Keiretsu important	No info	No info	No	No info	No info	No	Yes

Table 5.3: Summary of Motives for Interaction.

	Piab	*Ekkono*	*CEL-LINK*	*SECO*	*Mycronic*	*Autoliv*	*Coromant*
Market Seeking	Yes	Yes	Yes	Yes	No	No	Yes
Asset Seeking							
Factor Conditions	No	No	Yes	No	Yes	Yes	Yes
Demand Conditions	Yes	No	Yes	No	No	Yes	Yes
Supplier Conditions	No	No	No	No	Yes	No	No
Rivalry and Related Industry	Yes	No	Yes	No	No	Yes	No
Market Access Knowledge	No	No	No	No	No	No	No

Table 5.4: Summary of Interaction Strategy.

	Piab	*Ekkono*	*CELLINK*	*SECO*	*Mycronic*	*Autoliv*	*Coromant*
Interaction Mode	Distributor → JV with distributor → WOS	Distributor and Corporate innovation program	University incubator space → WOS	WOS	Integrated acquisition	Integrated acquisition	Sales office of parent company → WOS
Activity Allocation	Sales and testing lab National HQ	Sales No offices	Sales, technical support and application support National HQ	Sales Satellite office	R&D and locally outsourced manufacturing Satellite office	R&D and production Satellite office	Sales and productivity centre National HQ

6 Analysis

The objective of this section is to analyse the empirics by applying the theoretical framework. The analysis will be divided into two parts, using two different methods which provide different perspectives but ultimately have the same aim. First, a cross-case analysis will be presented, in which all cases will be analysed jointly, following the same structure as in the case reports. Each component of the model for Interaction Strategy Choice will be evaluated, in order to fulfil the explorative purpose of the thesis. Second, a cross-case synthesis will be conducted in which cases are partitioned after the sub-factors in the Interaction Strategy Choice Model in order to shed light on patterns of correlation.

6.1 Cross-Case Analysis

6.1.1 Company Characteristics

Company Size

In the theory chapter, it was established that there is evidence that a company's size may affect its cluster interaction. In the study, this was included as number of employees globally, number of employees in Japan and share of revenue in Japan.

The studied companies differ in size regarding number of employees globally, ranging from 13 to 68 000 employees. Three of the companies physically present in Japan have around one percent of their employees located in Japan. Of the remaining three companies, Autoliv and Mycronic have around three respective four percent of their employees situated in Japan whereas Coromant has seven percent.

Regarding the companies' share of revenue in Japan, it is hard to draw any conclusion as most of the companies did not want to disclose the exact numbers. It is noteworthy from table 6.1, that around ten percent of Autoliv's revenue is generated in Japan but up to 30% is generated by Japanese companies including their operations globally. This shows that share of revenue does not capture the whole importance of a market, and that locations can be strategically important despite not directly generating a large share of revenues.

Industry

In the theory chapter, there was also evidence that a company's industry, and whether it is a service or a product company, may affect its market entry mode.

The case companies represent a wide variety of different industries including automation, software development, bio-printing, machining tools, electronics manufacturing tools and automotive safety. As mentioned previously, Japan's top four export industries are vehicles, machinery including computers, electrical machinery equipment and medical apparatus (World's Top Exports, 2021). Similar to the Japanese export, Sweden's top three export industries are machinery including

computers, vehicles and electrical machinery equipment, with medical apparatus in tenth place (World's Top Exports, 2020). In other words, the case companies belong to industries where both Sweden and Japan are in the forefront, and which constitute an important part of respective country's export sector. However, this is not just a coincidence, it is also an effect of the thesis' method, which targeted companies active in such industries shared by Sweden and Japan.

Six of the case companies are pure product companies with various degrees of complementary service offerings while one company is a mixed company, which generates a substantial amount of their revenue through services. In other words, there are not any service companies represented in the sample of case companies. The absence of Swedish service companies in this study could either depend on the process of identifying case companies or that there are no such companies. According to Kianto, Hurmelinna-Laukkanen and Ritala (2010), a key characteristic of service companies is the close interaction between the company and its customer when conducting the service. Many of the interviewees mentioned language barriers and scepticisms towards foreignness as cultural factors specifically for their clusters and many argued that those are national cultural traits as well. Therefore, a possible explanation is that there are few foreign service companies in Japan due to problems in sustaining the necessary close interactions with local customers.

International Experience

In market entry theory, previous experiences of market entry and the personal experiences and diversity of top management has been shown to affect the entry mode. A parallel was drawn to cluster interactions, where each company was asked about the company's international experience before interacting with the cluster, as well as how they think personal experiences affected their strategy choices.

The international experience on company level varied between the cases. Autoliv, Mycronic and Coromant are three global companies and had a long history of international business when they started to interact with their respective clusters. Piab is also a global company which had a great amount of international experience when they decided to enter their cluster in the 1990s. On the contrary, CELLINK and Ekkono are relatively new companies and Japan was one of the first countries they interacted with outside Sweden, which means they had a low level of international experience. From the interview with SECO, it was not possible to distinguish their level of international experience before establishing in Nagoya.

Regarding how management's experiences affect the interaction strategy, three of the case companies could not answer if it affected while four companies provided potential influencing aspects. In Ekkono's case, the interviewee believed that management's personal experiences of how long it takes to enter the Japanese market, influenced Ekkono to initiate the process early. In Mycronic's case, their first point of contact with KNE (the company they acquired) was by the Strategic Portfolio Manager who manages acquisitions at Mycronic. The interviewee stated that if the contact had been initiated by someone else, it might not have occurred to them that acquiring KNE was a possible or suitable strategy. Both Autoliv and CELLINK believe that having a Japanese-speaking employee with relations to Japan facilitated and encouraged their cluster interaction. Bylund from CELLINK, who grew up in Japan, argued that her experiences might have affected that

Japan was the second country CELLINK established in. In Autoliv's case, the interviewee mentioned that a senior employee with ties to Japan might have been the reason that Autoliv dared establish more activities in Japan. In conclusion, most of the case companies could give concrete examples of how management's personal experiences affected the interaction strategy.

6.1.2 Cluster Characteristics

Cluster Type

In the theory chapter, clusters were divided into origin clusters and industrial clusters, which were further divided in Marshallian, hub-and-spoke, satellite platform and state anchored clusters.

The cases in this study included all types of industrial clusters, except for the satellite platform. It is worth noting, however, that Kyushu seems to have started as a satellite platform, and that Tsukuba resembles a satellite platform as well. There were no examples of origin clusters. Instead, multiple interviewees mentioned that organisations such as the Swedish Embassy in Tokyo and Business Sweden have fulfilled a similar purpose. These organisations seem to give some of the benefits as origin clusters, but companies have not formed clusters around them. With the exception of the country-wide manufacturing automation cluster which Piab perceives itself to be a part of, all cluster can be pinpointed to a certain city or city region. Ekkono is not focused on a specific city region either, but this is rather because they are interested in all of the major automobile clusters, which are concentrated to Nagoya, Tokyo and Hiroshima.

There seems to be a relationship between the industry and cluster type, with the heavy industries concentrated around Nagoya and on Kyushu characterised by a hub-and-spoke structure, as observed in the Ekkono, Seco, Coromant and Mycronic cases. It is worth noting that Piab, who serves the manufacturing industry more broadly, does not perceive that their customers or competitors are organised in this way or even to be concentrated in any specific region.

The cluster which is most clearly centred around a university is that in the CELLINK case. It is interesting to note that CELLINK initially used an interaction mode which is unique in the study, and which was not identified in the theoretical framework of this thesis, namely starting in a university incubation centre. This interaction mode would only be viable in a university centred cluster and shows that the cluster type can affect what interaction modes are available. More generally, cluster which have a network facilitator (i.e. a central organisation) of some sort, offer interaction modes not available in other clusters.

Cluster Life Cycle

Clusters have been found to follow a life cycle pattern similar to that of industries, which, as shown in the theory chapter, may affect the way companies interact with the cluster. The life cycle phases are origin, growth, maturity and decline.

The CELLINK case stands out as the target cluster was in the growth phase, whereas all other clusters were categorised as mature. Like CELLINK, Ekkono also used a unique interaction mode with their participation in Plug & Play. Although Tokyo's automotive cluster is mature, Plug &

Play focuses on novel solutions in the modern mobility industry and could be likened with a growth cluster within the traditional automotive industry. CELLINK and Ekkono, two relatively young companies, indicate that clusters in the growth phase might provide non-traditional interaction modes. Another interpretation is that the life cycle of the industry, rather than the cluster, makes these non-traditional interaction modes available.

Six out of seven target clusters were in the mature phase, and a natural conclusion from this is that Swedish companies who interact with Japanese clusters chose to do this in the mature stage. This could e.g. be because it is easier, the benefits are larger, uncertainty about the cluster's development is lower or simply because mature clusters are more well known. This result is interesting, and in line with the findings of Marchi, Maria and Gereffi (2017), who found that MNEs tend to enter clusters in the origin and maturity phases. However, it does not necessarily mean that the life cycle phase affects *how* the company choses to interact with the cluster. Finally, the excess of mature cases might simply be an effect of that they are much easier to identify, as mature clusters are more publicly known.

Cultural Factors

Local culture was identified in the theory chapter as something which could affect the interaction strategy. The influence of keiretsu was also included in the original model, as this is a characterising trait of the Japanese business environment. In section 4.3, Japan and Sweden were compared according to Hofstede's six cultural dimensions power distance, individualism, masculinity, uncertainty avoidance, long term orientation and indulgence.

When asking about cultural factors that characterise the target clusters, four main themes kept coming up: language barriers, the importance of relationships, scepticism towards foreignness and an orientation towards technical details. According to the interviewees, the first three themes seemed to follow a similar geographical pattern. Tokyo was generally perceived as more bilingual, less sceptical towards foreignness and less dependent on relationships (or at least faster at forming new relationships). The traits then became more pronounced the further away from Tokyo and the smaller the city, with the exception of Tsukuba. Notably, Swedish companies have chosen to establish in clusters everywhere on this "scale" of cultural traits.

Language barriers came up as a problem for foreign companies in almost every interview. The most extreme case was Mycronic's experiences in Fukuoka, where they even had problems finding professional translators, but the issue was expressed in Tokyo as well. As an example, Piab mentioned that they had had serious issues with finding commercially skilled, bilingual staff.

Another factor which came up repeatedly was the reliance on personal relationships, and the time it takes to build those relationships. For companies interacting with a cluster, this might make it more difficult to become "embedded" and gain the benefits they hoped. However, it also means that interaction modes involving a physical presence can be beneficial to other modes, as it enables the company's staff to have a sustained contact with local actors.

A third, and related, theme was that multiple interviewees brought up a general scepticism towards foreign products and companies. Both Autoliv and Coromant mentioned that it was important to them to signal a commitment to Japan and their local region in order to downplay their foreignness. For market seeking companies, this can mean that locating more activities than a sales function in the cluster, or in Japan, can be beneficial, as was the case with CELLINK's technical support and Coromant's production.

The scepticism towards foreignness can also affect what interaction strategies are even possible. In the most extreme case, Mycronic's acquisition target's suppliers refused to sell their products to a foreign company, and Autoliv mentions that Japanese owners can be hesitant to sell to foreign investors. In other words, the idea of buying a local company in order to get around the obstacle of foreignness might not even be a possible alternative.

Technical orientation was brought up in two of the interviews as an important trait. This was not brought up to describe any specific cluster, but rather in reference to Japanese culture generally.

It is interesting to compare the findings above to the theory presented by Hofstede. None of the themes described explicitly match Hofstede's dimensions, but some parallels can be drawn. Japan's relatively low score on individualism, which means that they value loyalty to the group more than Swedes, is likely tied both to the importance of relationships and the scepticism towards foreignness. Japan's high score on uncertainty avoidance could perhaps also explain the scepticism towards foreignness.

Only Coromant brought up keiretsu as an important factor in their target cluster, Nagoya. Many interviewees were either unsure about the relevance of keiretsu or gave answers that were more related to intercompany relationships generally, and not keiretsu in the strict definition. From the empirics, no real conclusions can be drawn about the influence of keiretsu on interaction strategy.

6.1.3 Motives for Interaction

In section 3.3.1, market and asset seeking motives were distinguished. Asset seeking was further broken down in factor conditions and knowledge seeking, which in turn consisted of demand conditions, supplier conditions, rivalry conditions and market access knowledge.

The motives for interaction with respective cluster differed among the case companies. All companies except Mycronic and Autoliv mentioned that they have market seeking objectives with their cluster interaction. The majority of the companies with market seeking objectives also mentioned demand conditions as a motive to interact with the cluster. They want to be present in the cluster to get a deeper understanding of the customers' needs and not only increase the sales volume. This is not the case with Ekkono and Seco, who stated that they do not consider any other motives with the interaction than approaching their customers to increase the sales.

From the interview data, it is shown that all asset seeking motives are represented by at least one case company, except from the objective to gain market access knowledge. Market access knowledge corresponds to the motive of interacting with an origin cluster. An origin cluster consist

of companies who wish to facilitate their entry in a foreign market by drawing from the experience of compatriot companies. Since none of the case companies mentioned Market access knowledge as an objective, this study indicates that it is rare that companies interact with clusters to gain this knowledge. Karbassi mentioned in the interview with Piab that the Swedish Trade Council (today known as Business Sweden) probably were helpful when Piab was to enter Japan. The Swedish Embassy in Tokyo has also been of great importance for Swedish companies who wish to enter the Japanese market (Rahiminejad and Zaborowska, 2019). Therefore, it seems like Swedish companies prefer to consult governmental institutions rather than compatriot companies in origin clusters when seeking knowledge about how to enter the Japanese market.

Mycronic was the only company who mentioned supplier conditions as an objective of interacting with the cluster. The company they acquired, KNE, had designed a new product with unique components that are only produced on Kyushu. Even though Mycronic had plans to move the production after the acquisition, the local suppliers made it impossible to move the production without having to pay expensive tariffs. To conclude, the proximity to suppliers is an important aspect for Mycronic.

6.1.4 Interaction Strategy

In the theory chapter, interaction strategy was defined as a combination of the interaction mode and the activity allocation in the target cluster. Interaction modes were divided into remote, which were not further specified, and co-location modes, which consisted of subsidiaries, joint ventures, partial and full acquisitions.

All the cases but one currently have a physical office in the target cluster. Only Ekkono has a completely remote interaction strategy, although other companies have previously relied on distributors. Piab is the only company which has entered a joint venture, although Mycronic mentioned that, in hindsight, a JV might have been better than an acquisition.

Half of the companies with physical offices in the cluster have made it their national HQ. Five out of seven companies have a sales function in the cluster, making it the most common activity allocation. Most of the companies with sales functions also have some sort of support function located in the cluster, either as a differentiator or as an order qualifier. Both the companies with R&D departments also have production located in the cluster, although Mycronic's production is outsourced to a local company.

Many of the case companies have changed mode since they first started interacting with the cluster. Market entry theory, which this thesis has drawn on, is often focused on the moment of entry, which would be analogous to the first contact with the cluster. However, interacting with a cluster and being active in a market is a continuous process and subsequent interaction modes are equally important as the first one. The fact that so many of the case companies have at some point changed interaction mode indicates that there might be an interaction life cycle. This is in line with the Uppsala model, which says that companies entering a new market typically go through phases of increasing commitment.

In the case study, two distinctions came up which were not included in the original theoretical framework. First, an aspect that came up in interviews was the distinction between having the national HQ in the cluster, or just a satellite office. As shown in table 5.4, this can be seen as a question of activity allocation. The second aspect that came up in interviews was the distinction between acquisitions which lead to a total integration (as was the case with both Autoliv and Mycronic) and acquisitions in which the target keeps some of its independence. A complete taxonomy of interaction modes should include this distinction.

Additionally, a few interaction modes were identified in this case study which were not included in the theory chapter. These were CELLINK's entry through Kyoto University's incubator and Ekkono's participation in the Plug & Play program. The use of distributors is a remote mode which was not explicitly mentioned in the theory chapter and came up in multiple cases. The exploratory interviews also revealed two new interaction modes, namely inter-cluster networking activities arranged by a cluster organisation and the use of technology scouts. These four interaction modes should also be included in the taxonomy.

6.2 Cross-Case Synthesis

6.2.1 Company Characteristics

Within company characteristics, many of the explanatory variables are unsuitable for cross-case synthesis, either because there is lacking data (share of revenue), not enough examples of each type (product vs service) or because there are too many variable values (industry and international experience of management). The number of employees in the cluster has been excluded as it is so heavily affected by the activity allocation that it is meaningless to use as an explanatory variable.

Table 6.1 presents a partitioning of the companies after their number of employees globally. The limit of 2000 employees was chosen because it was a clear distinction between Mycronic's 1500 employees and Seco's 4100 employees. No real patterns can be discovered from this partitioning. However, one can see that bigger companies do not necessarily have more activities allocated to the cluster location. It is also worth noting that the only remote case, Ekkono, has by far the smallest global headcount. Finally, both Ekkono and Mats Lindoff (from the exploratory interviews) mentioned that the size of the company affects what interaction modes are viable, as certain modes requires too many resources for small companies.

Table 6.1: A partitioning after the number of global employees.

More than 2000 employees globally		
Company	**Interaction Mode**	**Activity Allocation**
SECO	WOS	Sales Not HQ
Autoliv	Integrated acquisition	R&D, production Not HQ
Coromant	Sales office of parent company → WOS	Sales and productivity centre HQ
Less than 2000 employees globally		
Piab	Distributor → JV with distributor → WOS	Sales and testing lab HQ
Ekkono	Distributor and Corporate innovation program	Sales
CELLINK	University incubator → WOS	Sales, technical support and application support HQ
Mycronic	Integrated acquisition	R&D, locally outsourced production Not HQ

Table 6.2 presents a partitioning of the companies after a classification of their international experience as a company. Seco is not included in the analysis due to missing data. Ekkono and CELLINK are considered to have limited international experience while Piab, Mycronic, Autoliv and Coromant had extensive experience when they started to interact with their respective cluster. This partitioning indicates that companies with limited international experience have employed new types of interaction modes. Both Ekkono and CELLINK started in 2016 while the other companies are much older. That means in this case, the companies' age and their level of international experience are correlated. As both the university incubator and Plug & Play were targeted at start-ups, it seems that the real reason why CELLINK and Ekkono could utilise unique interaction modes was their age. Therefore, it seems that company age is a better explanatory variable than international experience at company level to describe this phenomenon. Age is also a more operational feature than experience, which is subjective and complex to observe.

Table 6.2: A partitioning after international experience of company.

Limited		
Company	**Interaction Mode**	**Activity Allocation**
Ekkono	Distributor and Corporate innovation program	Sales
CELLINK	University incubator → WOS	Sales, technical support and application support HQ
Extensive		
Piab	Distributor → JV with distributor → WOS	Sales and testing lab HQ
Mycronic	Integrated acquisition	R&D, locally outsourced production Not HQ
Autoliv	Integrated acquisition	R&D, production Not HQ
Coromant	Sales office of parent company → WOS	Sales and productivity centre HQ

To conclude, the empirics indicate that a company's interaction strategy is influenced by the company's characteristics which is in line with the theoretical framework. The partitioning above shows no indication that size affects the interaction strategy, but since multiple interviewees indicated that company size affects what modes are viable, it will not be removed from the model. International experience at company level showed a clear pattern in table 6.2. However, as explained in the paragraph above, company age is a more suitable feature to explain this pattern. Therefore, the company's age will replace international experience at company level as a factor in the updated Interaction Strategy Choice Model.

6.2.2 Cluster Characteristics

Within cluster characteristics, some of the variables have been deemed unsuitable for analysis, due to lacking data (importance of keiretsu) or because there are not enough examples of each type (cluster life cycle).

Table 6.3 presents a partitioning of the cases according to the classification of the target clusters. The cases were divided into hub-and-spoke clusters, state anchored clusters and an "other" category which happens to contain the Marshallian case of Piab, and Mycronic whose target cluster might be Marshallian. The clearest pattern is that the companies interacting with hub-and-spoke clusters all primarily have sales allocated to the cluster.

Table 6.3: A partitioning after cluster type.

Hub-and-spoke clusters		
Company	**Interaction Mode**	**Activity Allocation**
Ekkono	Distributor and Corporate innovation program	Sales
SECO	WOS	Sales Not HQ
Coromant	Sales office of parent company → WOS	Sales and productivity centre HQ
State anchored clusters		
CELLINK	University incubator → WOS	Sales, technical support and application support HQ
Autoliv	Integrated acquisition	R&D, production Not HQ
Other clusters		
Piab	Distributor → JV with distributor → WOS	Sales and testing lab HQ
Mycronic	Integrated acquisition	R&D, locally outsourced production Not HQ

Table 6.4 presents an attempt to capture the main cultural traits discussed in 6.1.2 in a single variable, which will be referred to as conservatism. As discussed then, the degree of bilingualism, the scepticism towards foreignness and the dependence on relationships seemed to correlate and show a geographical pattern. Here, Tokyo and Tsukuba have been labelled as less conservative, in accordance with the description in 6.1.2. This partitioning does not present any clear patterns.

Table 6.4: A partitioning after cultural division.

Less conservative		
Company	**Interaction Mode**	**Activity Allocation**
Piab	Distributor → JV with distributor → WOS	Sales and testing lab HQ
Ekkono	Distributor and Corporate innovation program	Sales
Autoliv	Integrated acquisition	R&D, production Not HQ
More conservative		
CELLINK	University incubator → WOS	Sales, technical support and application support HQ
SECO	WOS	Sales Not HQ
Mycronic	Integrated acquisition	R&D, locally outsourced production Not HQ
Coromant	Sales office of parent company → WOS	Sales and productivity centre HQ

In conclusion, there are indications that the cluster type affects the interaction strategy, specifically that companies interacting with hub-and-spoke clusters primarily engage in sales. Although many companies mentioned cultural factors as important, no indications that they affect the interaction strategy could be found with this analytical technique.

6.2.3 Motives for Interaction

Regarding the motives for interaction, most aspects can be analysed thanks to sufficient and easily categorizable data. However, market access knowledge and supplier demand have been excluded due to insufficient examples. No partitioning on factor conditions or rivalry conditions is presented, as they yielded no interesting results.

Table 6.5 presents a partitioning of the cases according to whether the company is strictly market seeking, asset seeking or both. The patterns are impressively clear. Both market seeking companies only have sales activities in the cluster, and none of them have established a HQ there (Ekkono has no HQ in Japan as they are not physically present). It is worth mentioning that Lindén from Ekkono said they intended to establish a WOS in due time. Both of the asset seeking companies have utilised the same interaction mode, and have almost identical activity allocations, Mycronic having their production local but outsourced. Finally, all three cases which have both market and asset seeking motives have established WOSs in the target cluster. These offices are all national

HQs and are allocated with sales as well as some supporting functions. This is the clearest pattern in this chapter, giving a strong indication that motives affect the interaction strategy.

Table 6.5: A partitioning in purely market seeking, purely asset seeking and mixed motives.

Market seeking		
Company	**Interaction Mode**	**Activity Allocation**
Ekkono	Distributor and Corporate innovation program	Sales
SECO	WOS	Sales Not HQ
Asset seeking		
Mycronic	Integrated acquisition	R&D, locally outsourced production Not HQ
Autoliv	Integrated acquisition	R&D, production Not HQ
Mixed motives		
Piab	Distributor → JV with distributor → WOS	Sales and testing lab HQ
CELLINK	University incubator → WOS	Sales, technical support and application support HQ
Coromant	Sales office of parent company → WOS	Sales and productivity centre HQ

Table 6.6 addresses the relations between companies motivated by demand conditions and their interaction strategy. Three of the companies motivated by demand conditions have utilised WOS as interaction mode and have located their HQ in the cluster. It is noteworthy that all case companies who have located their Japanese HQ in the cluster, are seeking demand conditions. One can also see that sales activities are not necessarily related to demand conditions, as companies within both groups have sales activities. Moreover, there seems to be a relation between demand conditions and allocation of service and technical support function. Piab has a testing lab, CELLINK has technical and application support and Coromant has their productivity centre in the cluster.

Table 6.6: A partitioning in companies seeking demand conditions and not.

Motivated by demand conditions		
Company	**Interaction Mode**	**Activity Allocation**
Piab	Distributor → JV with distributor → WOS	Sales and testing lab HQ
CELLINK	University incubator → WOS	Sales, technical support and application support HQ
Autoliv	Integrated acquisition	R&D, production Not HQ
Coromant	Sales office of parent company → WOS	Sales and productivity centre HQ
Not motivated by demand conditions		
Ekkono	Distributor and Corporate innovation program	Sales
SECO	WOS	Sales Not HQ
Mycronic	Integrated acquisition	R&D, locally outsourced production Not HQ

In conclusion, it seems like interaction motives affect the company's interaction strategy where a pattern was identified in the partitioning according to market seeking, asset seeking and mixed seeking companies. Pure market seeking companies only have sales in the cluster and do not have a HQ in the cluster. Asset seeking companies have utilised an integrated acquisition as interaction mode, have located their HQ outside the cluster and have R&D as well as some sort of production in the cluster. The mixed motive companies have all utilised WOS as interaction strategy, have their HQ as well as a service or support function in the cluster. Seeking demand conditions and allocating sales to a cluster do not necessarily correlate.

7 Discussion

In this section, the analysed results will be discussed in relation to the research questions. An updated taxonomy of possible cluster interaction modes will be presented, followed by a description of the interaction strategies Swedish companies have used to interact with Japanese clusters. Finally, an updated model of Interaction Strategy Choice will be presented and the extent to which this thesis can provide any explanatory conclusions will be discussed.

The first research question is what methods companies can utilise to interact with clusters outside of their home base. The theory chapter presented an initial categorisation of interaction modes, including remote modes, subsidiary, joint venture, partial and full acquisitions. Figure 7.1 presents a new categorisation of interaction modes, which has been updated in two ways. First, numerous interaction modes have been added which were discovered in the exploratory and case interviews. Technology scouting refers to interaction modes similar to the one described by Mats Lindoff at Sony Ericsson. Inter-cluster Networking refers to activities arranged by cluster organisations that serve to connect member companies with other clusters, as described by Christina Wanscher at Odense Robotics. Accelerator/Incubator has been used to cover programs similar to the university incubator and the Plug & Play program from the CELLINK and Ekkono cases. The mode has been included both under remote and co-location. Second, the original co-location modes have been restructured to better resemble the way the interviewees think about them. For example, joint ventures were equally often described as an alternative to acquisitions as they were thought of as a form of greenfield investment, similar to starting a subsidiary. Similarly, the share of ownership was never brought up when discussing acquisitions, but the degree of integration was.

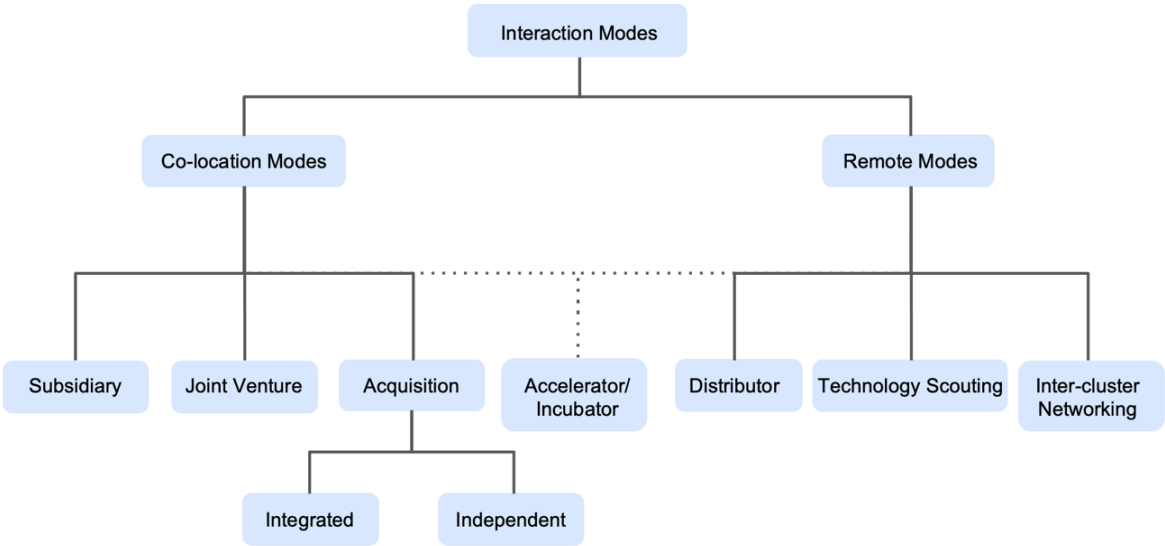


Figure 7.1 An updated categorisation of cluster interaction modes.

As has been argued in the method section, the cases in this study can be seen as representative of the population of Swedish companies interacting with Japanese clusters. Therefore, they can be studied to answer what strategies Swedish companies have utilised to interact in Japan, which is the second research question. All companies but one currently have a physical office in the target

cluster, and have thus utilised a co-location strategy. Four out of the seven companies have established a wholly owned subsidiary although three of them initiated the interaction using another mode. These companies started with a distributor, an incubator, or a sales office of their parent company. In addition to wholly owned subsidiaries, Swedish companies have utilised integrated acquisition. Apart from the co-location strategies, one company has adapted a remote strategy and interacts with the cluster through an accelerator.

The interaction strategy is a combination of interaction mode and activity allocation. Five of the companies have a sales function targeting the cluster which makes it to the most common activity. Other activities are various customer support functions, R&D and production. These activities will be added as components under activity allocation in the updated model. Another observation is that companies often change interaction strategy, possibly going through phases of interaction.

The third research question is to determine what factors affect the interaction strategy of Swedish companies interacting with Japanese clusters. An initial model for Interaction Strategy Choice was created with support from the existing literature within cluster theory, cluster strategy and market entry modes. It was found that the three categories of factors in terms of company characteristics, cluster characteristics and motives for cluster interaction could affect the cluster interaction strategy. The analysis indicates that the motives have a strong effect while the company and cluster characteristics has weaker effect. This is represented by the size of the arrows in the new model, which is illustrated in Figure 7.2. None of the categories of factors has been completely removed from the model. Although the focus of this thesis is on how the three factors affect the interaction strategy, the arrows between the categories have been kept to remind that they likely affect each other as well. The model for Interaction Strategy Choice has been reviewed and will be updated as described below.

The company characteristics have been updated in two ways. First, the case study indicated that there are few Swedish service companies interacting with Japanese clusters. The distinction between product and service companies will therefore be removed. Second, company age was argued in the analysis to be a superior replacement for level of international experience at company level, as it is both the likely cause of the observed pattern and a more operational feature. Therefore, it has replaced international experience at company level in the updated model.

The cluster characteristics have been updated in two ways. First, origin cluster has been removed as a cluster type, as the study provided no indications that Swedish companies in Japan have formed origin clusters. Second, cultural factors have been further specified with the three themes bilingualism, scepticism towards foreignness and relationship dependence. Technical orientation has not been included as it was mentioned as a general trait of Japanese culture and not something that distinguishes different clusters. Although the cross-case synthesis did not reveal any patterns along cultural lines, many of the interviewees described this as an important factor which is why it has not been removed from the model.

Motives for interaction has only been updated by removing market access knowledge, as the study provided no indications that Swedish companies utilise origin clusters with this motive. The division of market seeking and asset seeking remains in the model.

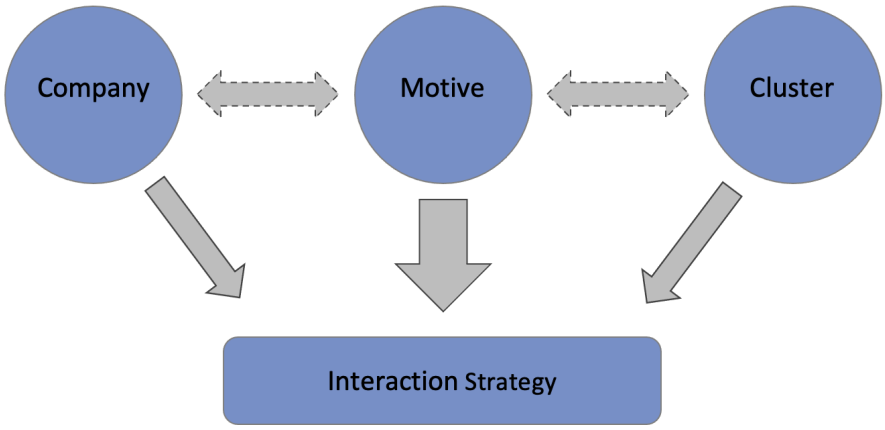


Figure 7.2: An updated model of Interaction Strategy Choice.

The updated model can be seen in Figure 7.2, and the differences between the initial model for Interaction Strategy Choice and the reviewed version can be seen in Table 7.1.

Table 7.1: The components of the initial and the updated model for Interaction Strategy Choice.

Components of the Interaction Strategy Choice Model		
	Old Model	**New Model**
Interaction Strategy	*Interaction Mode* ◊ Remote Modes ◊ Co-location Modes ♦ Subsidiary (Greenfield) ♦ Joint Venture (Greenfield) ♦ Full Acquisition (Acquisition) ♦ Partial Acquisition (Acquisition) *Activity Allocation*	*Interaction Mode* ◊ Remote Modes ♦ Distributor ♦ Technology Scouting ♦ Inter-cluster Networking ♦ Accelerator/Incubator ◊ Co-location Modes ♦ Subsidiary ♦ Joint Venture ♦ Integrated Acquisition (Acquisition) ♦ Independent Acquisition (Acquisition) ♦ Accelerator/Incubator *Activity Allocation* ◊ Sales ◊ Supporting Functions ◊ Production ◊ R&D ◊ HQ Allocation

Motive for Interaction	*Market Seeking* *Asset Seeking* ◊ Factor Seeking ◊ Knowledge Seeking ♦ Demand Conditions ♦ Supplier Conditions ♦ Rivalry Conditions ♦ Market Access Knowledge	*Market Seeking* *Asset Seeking* ◊ Factor Seeking ◊ Knowledge Seeking ♦ Demand Conditions ♦ Supplier Conditions ♦ Rivalry Conditions
Cluster Characteris-tics	*Cluster Type* ◊ Origin Cluster ◊ Industrial Cluster ♦ Marshallian ♦ Hub-and-spoke ♦ Satellite Platform ♦ State Anchored *Cluster Life Cycle* ◊ Origin ◊ Growth ◊ Maturity ◊ Decline *Cultural Factors*	*Cluster Type* ◊ Marshallian ◊ Hub-and-spoke ◊ Satellite Platform ◊ State Anchored *Cluster Life Cycle* ◊ Origin ◊ Growth ◊ Maturity ◊ Decline *Cultural Factors* ◊ Bilingualism ◊ Scepticism towards foreign-ness ◊ Relationship dependence
Company Characteris-tics	*Size* *Industry* *Service vs Product* *International Experience* ◊ *In Company* ◊ *In Top Management*	*Size* *Industry* *Company Age* *International Experience* ◊ *In Top Management*

Figure 7.3 presents an alternative version of the Interaction Strategy Choice Model where the three influencing factors company characteristics, cluster characteristics and motives for interaction are visualised together with their associated components.

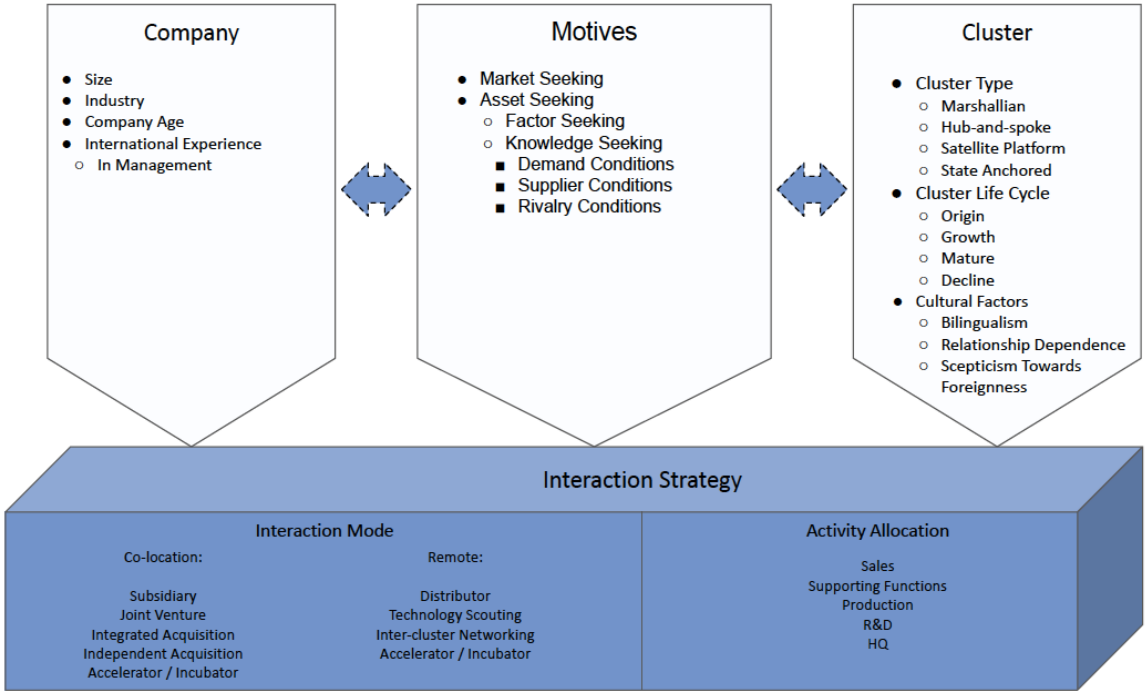


Figure 7.3: The Model of Interaction Strategy Choice illustrated with all components of the influencing factors.

The explorative research purpose of this thesis means that the authors should strive for a conclusion which goes beyond a simply descriptive account. In an attempt to reach this level of analysis, five hypotheses are presented below. They summarise the observed patterns in the cross-case synthesis. The first hypothesis is related to the intersection between company and the interaction strategy in the Interaction Strategy Choice Model. The second and the third hypothesis regards the intersection between cluster and the interaction strategy while the fourth and the fifth hypothesis relates to the intersection between cluster and the interaction strategy.

Hypothesis 1: Younger or less internationally experienced companies have unique access to certain interaction modes, such as accelerators and incubators. They should take advantage of these interaction modes, as they require less resources than other strategies.

Hypothesis 2: Companies which interact with hub-and-spoke clusters primarily allocate sales activities to the cluster.

Hypothesis 3: Clusters in the growth stage, and clusters which have a central organisation (e.g. a university or a cluster organisation) are more likely to offer non-standard interaction modes, such as accelerators and incubators.

Hypothesis 4: Purely market seeking companies tend to only allocate a sales function to their target clusters. Purely asset seeking companies tend to interact through integrated acquisitions,

and locate R&D and production in the cluster. Companies with both market and asset seeking motives tend to interact through a subsidiary, and have sales and supporting functions as well as their national HQ allocated to the target cluster.

Hypothesis 5: Companies looking to take advantage of demand conditions in the cluster tend to allocate sales and supporting functions there and locate the national HQ in the cluster.

8 Conclusions

The final section of the thesis provides answers to the research questions and evaluates to what degree the purpose has been fulfilled. It also discusses the quality of the research according to the four credibility constructs described in the method section. Finally, the theoretical and practical implications of the thesis are discussed, and suggestions for future research given.

8.1 Answering the research questions

RQ1: What methods can companies utilise to interact with clusters outside of their home base?

There are two main categories of cluster interaction modes, co-location modes and remote modes. Co-location refers to an interaction mode with a physical presence in the cluster and can be further divided into establishing a subsidiary, joint venture, or an integrated or independent acquisition. Remote modes include distributors, technology scouting and inter-cluster networking. An additional mode is interaction through an accelerator or an incubator which can be both a co-location mode and a remote mode.

RQ2: What interaction strategies have Swedish companies utilised to interact with Japanese clusters?

The interaction strategy is a combination of the interaction mode and the activities allocated to the cluster, where the strategy often evolves over time. It has been identified that Swedish companies most commonly establish a subsidiary to interact with Japanese clusters. However, there are also examples of integrated acquisitions and remote interaction modes. Most companies have sales and supporting functions but there are cases with R&D and production allocated to the cluster.

RQ3: What factors affect the strategy choice among Swedish companies interacting with clusters in Japan?

A company's interaction strategy choice is affected by three factors: the motives for cluster interaction, the company's characteristics and the cluster's characteristics. These factors are related and there are indications that the motives for interaction have the greatest impact on the strategy choice.

Motives for cluster interaction can be categorised as either market seeking or asset seeking, where asset seeking can be further divided into factor conditions, demand conditions, supplier conditions as well as rivalry conditions. The company characteristics consist of size, industry, company age and the level of international experience in top management. The cluster characteristics comprises cluster type, stage in the cluster life cycle and cultural factors.

8.2 Fulfilment of purpose

The purpose of this thesis was to identify and explore the methods companies use to interact with clusters outside of their home base, what their motives for interacting are and why they choose a certain interaction strategy. The purpose has been fulfilled through a thorough literature review and an interview study with Swedish companies in Japan. The question of how companies choose a certain interaction strategy has been answered on an exploratory level, which is in line with the purpose.

8.3 Reflections on Research Quality

Several actions have been taken to ensure high quality of this research in terms of representativeness, reliability, construct and internal validity. Representativeness expresses the degree to which the findings from a study can be transferred to other situations, and the scope of situations for which the findings are representable. The case companies were selected to represent a large variety of industries, target clusters and motives for cluster interaction. As has been argued, they were selected from industries in which Swedish companies are likely to interact with Japanese clusters. A weakness with the study is that remote cases were hard to identify, which makes it possible that they are underrepresented in the case selection. The findings in this thesis are representative for Swedish companies in Japan, with the possible exception of remote interaction cases. The findings can be analytically transferred to other situations.

Reliability in case studies means that biases and errors should be avoided, so that another researcher conducting the same case study again would reach the same result. Individual case reports were written after each interview by combining thorough interview notes with recordings from the interview in order to reduce errors. The interviews were semi-structured which allowed the authors to be flexible and adapt some questions to get well developed answers. However, adapting and tweaking some questions led to incomplete answers in some interviews. An additional weakness with semi-structured interviews is that if the study is reconducted by another researcher, the answers would probably differ slightly. There is also a risk that the interviewees were biased in their descriptions of concepts as cultural aspects and clusters, e.g. if they had perceived a certain cultural trait themselves based on a single occurrence or if their answers were based on generalisations and prejudices.

Construct validity refers to how well the researcher manages to formulate operational constructs, without which they may revert to subjective measures. Construct validity was considered by letting the interviewees review their respective company report to identify and remove potential misinterpretations. Another concept which was described to ensure construct validity was the corroboration of fleeting definitions, e.g. cluster type and cluster life cycle, that was discussed during the interviews. Due to the absence of clear definitions and commonly known terms, the interviewees rather described the circumstances than stating what type and stage the cluster was in. In other words, insufficient descriptions in the literature and short answers in the interviews sometimes made it difficult to corroborate the answers given in interviews. Therefore, the measures to ensure construct validity were not as profound as planned.

Internal validity is the ability of distinguishing causal from spurious explanations, and is therefore mainly a concern for explanatory and causal studies. As the purpose here was not to establish causal relationships, internal validity has not been a great concern of the authors.

8.4 Implications

8.4.1 Theoretical Implications

The contribution of this thesis to the theory on cluster interaction is threefold. First, it presents a taxonomy of interaction modes, second it expands the understanding on how Swedish companies interact with Japanese clusters specifically, and third it takes a holistic approach to the factors affecting cluster interaction strategy.

The taxonomy of interaction modes is presented in Figure 7.1 and in the answer to RQ1. After an extensive literature review, the authors are not aware of any such classification of cluster interaction modes previously being published. Unlike the various entry mode categorisations which exist in market entry literature, the one presented here is specifically suited for cluster interaction and includes non-transactional modes (e.g. technology scouting).

The study also expands the understanding of how Swedish companies interact with Japanese clusters. By presenting and summarising qualitative data from a substantial and representative part of the population under study, this thesis provides the first aggregate description of the topic.

Finally, the updated Interaction Strategy Choice Model presented in Figure 7.2 is the first holistic approach to understanding what factors affect cluster interaction that the authors are aware of, again despite extensive literature research. To the extent that it exists, previous research has looked at how single factors, e.g. the cluster life cycle, affect companies' interaction strategy choice. Multiple hypotheses about how the three factors motives for interaction, company characteristics and cluster characteristics affect the strategy choice and which factors are more influential have also been presented and provide directions for further research.

8.4.2 Practical Implications

The practical implications of this thesis are limited. The purpose was to identify and explore cluster interaction strategies in order to improve the theoretical understanding of the phenomenon. However, at this stage the models are not developed enough to be used as strategic guidance.

Two minor contributions to practitioners have nonetheless been identified. First, the taxonomy of interaction modes could serve as inspiration for all companies wishing to interact with clusters outside of their home base. Secondly, the empirics presented in this thesis contain experiences which could be useful to Swedish companies interacting with Japanese clusters, despite not explicitly answering a research question.

8.5 Suggestions for Further Research

The explorative nature of this thesis means that there is a plethora of possible future directions of research. These can be divided into research aimed at verifying the findings of this thesis, complementing its models and reaching for a higher level of understanding, i.e. research with an explanatory purpose.

One outcome of the thesis which should be verified and developed further is the taxonomy of interaction modes. The taxonomy could be verified by carrying out a similar case study among another population, after which one could evaluate whether the taxonomy was relevant and complete. As there was only one company in this case study which employed a remote interaction mode, it would also be interesting to verify it with a study specifically on remote cases.

The presented model could be complemented e.g. by studying how the factors affect each other or by exploring how interaction strategy develops over time. The Interaction Strategy Choice Model developed in this thesis focuses on how company characteristics, cluster characteristics and interaction motives affect the interaction strategy. A possible expansion would be to study how the categories, and the factors within them, affect each other. For example, as was mentioned in the analysis, there seems to be a possible relationship between the industry (a company characteristic) and the cluster type (a cluster characteristic). As has been discussed, many of the case companies have changed interaction strategy over time. A possible expansion of the models developed in this thesis would be to study the time dimension of interaction strategy, perhaps developing an "Uppsala model" adapted to cluster interaction.

Finally, if one would like to reach for a higher level of understanding, one could seek explanatory or even normative results. The hypotheses presented at the end of the discussion are proposals for what such results could look like, and as consequently also proposals for avenues worth exploring. To reach this level of understanding, individual relationships between interaction strategy and explanatory factors would likely need to be studied, and methodologies which allow for larger sample sizes should be considered.

Appendix A

Interview Guide

[Company X] refers to the specific company in the interview
[Industry Cluster Y] refers to the industry cluster

1. Introduction
    a. Introduction
        i. Present ourselves and thank for cooperation
        ii. Background about the project
        iii. The interview process (today and before publishing)
    b. Can we record this interview?
    c. Ask about time limitations for the interview
    d. Would you please introduce yourself and your time at [Company X]?

2. Company Characteristics
    a. Company size
        i. When did you establish a presence in [Industry Cluster Y]?
        ii. How many employees do you have in [Industry Cluster Y], Japan and globally?
        iii. What is [Company X]'s revenue in Japan and globally?
        iv. What departments do you have in Japan?
            1. Why are they located here?
    b. Industry
        i. How important would you say services are to your offering?
    c. International experience
        i. What other countries do you have activities in?
        ii. Was Japan one of the first countries you entered apart from Sweden?
        iii. What experiences of international affairs did [Company X] have when establishing in Japan?
        iv. Would you say that personal experiences affected the choice of establishment strategy?

3. Cluster Characteristics
    a. Cluster Type
        i. Where is [Industry Cluster Y] located?
            1. Does this place have any traditional industries associated with it?
            2. Are there any universities located in the area?
        ii. Why did this location become a cluster?
            1. Why are companies in this cluster successful today?
        iii. Do you know how many companies are within [Industry Cluster Y]?
            1. In general, is it smaller or larger firms within the cluster?

iv. Is any of the companies within the cluster seen as more important than the others?
    1. Is the cluster centred around a certain company?

b. Cluster Life Cycle
    i. Do you know when the cluster originated?
    ii. Would you say [Industry Cluster Y] is on the rise, declining or in a stable place?
        1. Has there been many new companies entering during the recent years?

c. Cluster Collaboration
    i. Does [Company X] collaborate with other companies, universities or networks within [Industry Cluster Y]?
        1. If Yes, In what way?
    ii. In general, how do companies in the cluster interact with each other?
        1. E.g. supplier, distributors, open innovation, rivals
    iii. Does the cluster have any official networks or alliances?
        1. If Yes
            a. What is the main goal?
            b. How are these organised?
            c. What companies can be part of these networks?

d. Cultural Factors
    i. What is special about the culture in [Industry Cluster Y]?
        1. How is it different from other places where you operate?
    ii. Did something in the culture make it easier to establish here?
    iii. Did something in the culture make it harder to establish here?
    iv. Did something in the culture make it more important to establish here (as opposed to interacting remotely)?

4. Motives for Establishment

a. How did [Company X] come to the decision to establish in [Industry Cluster Y]?
b. What were the main advantages you expected from being located here?
    i. Did you take into consideration any of the following?
        1. Factors (e.g. staff)
        2. Demand Conditions (e.g. deeper understanding of the demand or technical exchange)
        3. Supplier Conditions (e.g. getting access to the newest products, influencing their development)
        4. Rivalry Conditions (e.g. knowledge sharing, resource sharing, "tacit knowledge")
        5. Market access knowledge (e.g. knowledge sharing between compatriot companies)
c. Would you say that you came to fulfil these advantages?
    i. Have they changed over time?

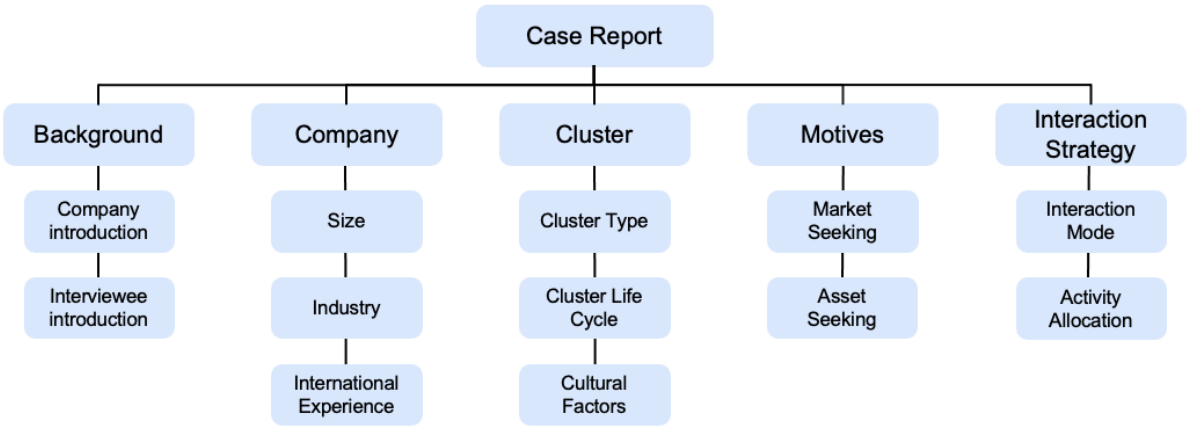
5. Establishment Strategy
    a. What were the steps in establishing a presence in [Industry Cluster Y]?
    b. What affected these choices?
    c. Was the choice affected by the Japanese corporate structure?
    d. Why did you not opt for [Whatever they did not do]?
    e. What methods have other companies used to establish in [Industry Cluster Y]?

6. Result of being present in [Industry Cluster Y]
    a. Would you say it was a good decision to establish in [Industry Cluster Y]?
    b. Is there anything you would have done differently?

7. Final Questions
    a. Is there anything else you would like to add about [Company X] in [Industry Cluster Y]?
    b. May we contact you if we have any further or clarifying questions?
    c. Do you have any documents or material we could look at?
    d. Review of interview notes
        i. We will send you our interview notes within a week
    e. Thank you!

Appendix B

Case Report Framework



References

Arita, T., Fujita, M. and Kameyama, Y. (2006). "Effects of Regional Cooperation Among Small and Medium-Sized Firms on Their Growth in Japanese Industrial Clusters", *Review of Urban & Regional Development Studies*, 18(3), pp. 209–228. doi: https://doi.org/10.1111/j.1467-940X.2006.00122.x.

Asmussen, C. G., Benito, G. R. G. and Petersen, B. (2009). "Organizing foreign market activities: From entry mode choice to configuration decisions", *International Business Review*, 18(2), pp. 145–155. doi: 10.1016/j.ibusrev.2009.01.002.

Autoliv. (2021). "Autoliv Annual Report 2020". Available at: https://www.autoliv.com/sites/default/files/Autoliv_AR%20Wrapping_2020_Feb25.pdf (Accessed: 21 April 2021).

Autoliv. (no date). "About Us, Autoliv". Available at: http://www.autoliv.com/about-us (Accessed: 21 April 2021).

Belussi, F. (2018). "New perspectives on the evolution of clusters", *European Planning Studies*, 26(9), pp. 1796–1814. doi: 10.1080/09654313.2018.1492059.

Belussi, F. and Caldari, K. (2009). "At the origin of the industrial district: Alfred Marshall and the Cambridge school", *Cambridge Journal of Economics*, 33(2), pp. 335–355. doi: 10.1093/cje/ben041.

Bennet, C. (2015). "AVGÖRANDE OMVANDLINGSFÖRMÅGA - Nycklar till ökad attraktivitet och konkurrenskraft". Kungl Ingenjörsvetenskapsakademien IVA.

Boell, S. k. and Hovorka, D. (2019). "Writing, arguing, contributing - a cogent argumentation framework for identifying, specifying, and evaluating research contribution", *Australasian Journal of Information Systems*, 23(23). Available at: http://ludwig.lub.lu.se/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=inh&AN=19623036&site=eds-live&scope=site (Accessed: 25 February 2021).

Boja, C. (2011). "Clusters Models, Factors and Characteristics". SSRN Scholarly Paper ID 1987198. Rochester, NY: Social Science Research Network. Available at: https://papers.ssrn.com/abstract=1987198 (Accessed: 17 February 2021).

Brouthers, K. D. and Hennart, J.-F. (2007). "Boundaries of the Firm: Insights From International Entry Mode Research", *Journal of Management*, 33(3), pp. 395–425. doi: 10.1177/0149206307300817.

Business Sweden. (no date). "Japan". Available at: https://www.business-sweden.com/markets/asia-pacific/japan/ (Accessed: 30 March 2021).

Cellink. (no date). "About us, Cellink Global". Available at: https://www.cellink.com/global/about-us/ (Accessed: 24 March 2021).

Chiaroni, D. and Chiesa, V. (2006). "Forms of creation of industrial clusters in biotechnology", *Technovation*, 26(9), pp. 1064–1076. doi: 10.1016/j.technovation.2005.09.015.

City of Tsukuba. (no date). "International city Tsukuba, Welcome to the City of TSUKUBA". Available at: http://www.tsukubainfo.jp/tsukuba/tsukuba.html (Accessed: 13 May 2021).

Couretas, J. (1997). "AUTOLIV SETS SIGHTS ON JAPAN WITH ACQUISITION", *Automotive News*, 22 December. Available at: https://www.autonews.com/article/19971222/ANA/712220772/autoliv-sets-sights-on-japan-with-acquisition (Accessed: 22 April 2021).

Cusmano, L., Morrison, A. and Pandolfo, E. (2015). "Spin-off and clustering: a return to the Marshallian district", *Cambridge Journal of Economics*, 39(1), pp. 49–66. doi: 10.1093/cje/beu032.

Desrochers, P. and Sautet, F. (2004). "Cluster-Based Economic Strategy, Facilitation Policy and the Market Process", *The Review of Austrian Economics*, 17(2), pp. 233–245. doi: 10.1023/B:RAEC.0000026833.26220.2d.

Dicken, P. (2015). "Global shift: mapping the changing contours of the world economy". 7th edition. New York: Guilford Press.

Dresch, A., Pacheco Lacerda, D. and Valle Antunes Jr, J. A. (2014). "Design Science Research : A Method for Science and Technology Advancement". Cham: Springer. Available at: http://ludwig.lub.lu.se/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=832051&site=eds-live&scope=site (Accessed: 25 February 2021).

Dutta, S., Lanvin, B. and Wunsch-Vincent, S. (2020). "GLOBAL INNOVATION INDEX 2020: who will finance innovation?". S.l.: WORLD INTELLECTUAL PROPER.

Ekkono. (no date). "About Ekkono, Ekkono Solutions AB". Available at: https://www.ekkono.ai/about-ekkono/ (Accessed: 13 April 2021).

Eriksson, S. and Lundin, M. (2016). "Automobile and Transport Cluster Mapping and Industry Landscape in Japan". EU-Japan Center for Industrial Cooperation. Available at: https://www.eu-japan.eu/news/report-automobile-and-transport-cluster-mapping-and-industry.

EU-Japan Centre for Industrial Cooperation. (2013). "Cluster Mapping in Japan. Tokyo". Available at: https://clustercollaboration.eu/sites/default/files/international_cooperation/2013_cluster_mapping_japan.pdf (Accessed: 23 February 2021).

EU-Japan Centre for Industrial Cooperation. (2016). "PMK initiative, EU-Japan". Available at: https://www.eu-japan.eu/japanese-clusters/protein-mall-kansai (Accessed: 23 February 2021).

EU-Japan Centre for Industrial Cooperation. (no date). "High Tech Cluster Support, EU-Japan". Available at: https://www.eu-japan.eu/high-tech-cluster-support (Accessed: 18 February 2021).

Franco, C., Rentocchini, F. and Marzetti, G. V. (2010). "Why do Firms Invest Abroad? An Analysis of the Motives Underlying Foreign Direct Investments", *IUP Journal of International Business Law*, 9(1/2), pp. 42–65.

Harvard Business School. (no date). "What are Clusters?". Available at: https://www.isc.hbs.edu/competitiveness-economic-development/frameworks-and-key-concepts/Pages/clusters.aspx (Accessed: 24 February 2021).

Hedlund, G. (1986). "The hypermodern MNC—A heterarchy?", *Human Resource Management*, 25(1), pp. 9–35. doi: 10.1002/hrm.3930250103.

Hofstede, G. (2011). "Dimensionalizing Cultures: The Hofstede Model in Context", *Online Readings in Psychology and Culture*, 2(1). doi: 10.9707/2307-0919.1014.

Hofstede Insights. (2021). "Country Comparison - Sweden & Japan", *Hofstede Insights*. Available at: https://www.hofstede-insights.com/country-comparison/ (Accessed: 24 February 2021).

Hofstede Insights. (no date). "National Culture". Available at: https://hi.hofstede-insights.com/national-culture (Accessed: 23 February 2021).

Holmström, C. (2020). "Svenska internationella företag, Ekonomifakta". Available at: https://www.ekonomifakta.se/Fakta/Foretagande/Naringslivet/Antal-anstallda-i-svenska-foretag--i-Sverige-och-utomlands/ (Accessed: 24 February 2021).

Höst, M., Regnell, B. and Runeson, P. (2006). "Att genomföra examensarbete". Lund: Studentlitteratur.

Inagaki, K. (2018). "Pressure on Kansai's centuries-old drug sector hub", *Financial Times*, 11 June. Available at: https://www.ft.com/content/27a0e762-5dec-11e8-ab47-8fd33f423c09 (Accessed: 12 April 2021).

Ingstrup, M. B. and Damgaard, T. (2013). "Cluster Facilitation from a Cluster Life Cycle Perspective", *European Planning Studies*, 21(4), pp. 556–574. doi: 10.1080/09654313.2012.722953.

Isserman, A. m. (1998). "What do we want from theory in rural development?", *Growth and Change*, 29(3), pp. 344–351. doi: 10.1111/0017-4815.00091.

Jankowiak, A. (2011). "Cluster models in Japan on the example of Toyota cluster", *Faces of Competitiveness in Asia Pacific RESEARCH PAPERS OF WROCŁAW UNIVERSITY OF ECONOMICS*, 191, pp. 173–187.

Japan External Trade Organization. (2020). "CELLLINK, a Swedish company that innovates life sciences with 3D bioprinting and bioink technology, establishes a Japanese subsidiary in Kyoto". Available at: https://www.jetro.go.jp/en/invest/newsroom/2020/2ce4c2dcbf8efe71.html (Accessed: 29 March 2021).

JETRO. (2020). "Attractive Local Regions in Japan - Fukuoka". Available at: https://www.jetro.go.jp/en/invest/region/data/fukuoka.html (Accessed: 27 April 2021).

JETRO. (2021a). "Attractive Markets - Life Science". JETRO. Available at: https://www.jetro.go.jp/ext_images/en/invest/img/attractive_sectors/life_science/life_EN_202103.pdf (Accessed: 12 April 2021).

JETRO. (2021b). "Attractive Markets - Manufacturing", p. 7. Available at: https://www.jetro.go.jp/ext_images/en/invest/img/attractive_sectors/manufacturing/manufacturing_EN_202103.pdf (Accessed: 6 April 2021).

Johanson, J. and Vahlne, J.-E. (1977). "The Internationalization Process of the Firm-A Model of Knowledge Development and Increasing Foreign Market Commitments", *Journal of International Business Studies*, 8(1), pp. 23–32.

Kianto, A., Hurmelinna-Laukkanen, P. and Ritala, P. (2010). "Intellectual capital in service- and product-oriented companies", *Journal of Intellectual Capital*, 11(3), pp. 305–325. doi: 10.1108/14691931011064563.

Kitagawa, F. (2005). "The Fukuoka Silicon Sea-Belt Project – An East Asian Experiment in Developing Transnational Networks", *European Planning Studies*, 13(5), pp. 793–799.

Konzelmann, S., Fovargue-Davies, M. and Wilkinson, F. (2018). "Britain's Industrial Evolution: The Structuring Role of Economic Theory", *Journal of Economic Issues (Taylor & Francis Ltd)*, 52(1), pp. 1–30. doi: 10.1080/00213624.2018.1430939.

Kotler, P. *et al.* (2019). "Influence of country and company characteristics on international business decisions: A review, conceptual model, and propositions", *International Business Review*, 28(3), pp. 482–498. doi: 10.1016/j.ibusrev.2018.11.006.

Kyushu Economic Federation. (no date). "Profile of kyushu" | *Kyushu Economic Federation*. Available at: https://www.kyukeiren.or.jp/english/profile/industrymaking.html (Accessed: 13 May 2021).

Lai, G. M. (1999). "Knowing who you are doing business with in Japan: a managerial view of keiretsu and keiretsu business groups", *Journal of World Business*, 34(4), pp. 423–448. doi: 10.1016/S1090-9516(99)00027-9.

Li, P. and Bathelt, H. (2018). "Location Strategy in Cluster Networks", *Journal of International Business Studies*, 49(8), pp. 967–989.

Lincoln, J. R. and Shimotani, M. (2010). "Business Networks in Postwar Japan: Whither the Keiretsu?", *The Oxford Handbook of Business Groups*. doi: 10.1093/oxfordhb/9780199552863.003.0005.

Majocchi, A. and Presutti, M. (2009). "Industrial clusters, entrepreneurial culture and the social environment: The effects on FDI distribution", *International Business Review*, 18(1), pp. 76–88. doi: 10.1016/j.ibusrev.2008.12.001.

Marchi, V. D., Maria, E. D. and Gereffi, G. (2017). "Local Clusters in Global Value Chains: Linking Actors and Territories Through Manufacturing and Innovation". Routledge.

Markusen, A. (1996). "Sticky Places in Slippery Space: A Typology of Industrial Districts', Economic Geography", 72(3), pp. 293–313. doi: 10.2307/144402.

Martin, R. and Sunley, P. (2003). "Deconstructing clusters: chaotic concept or policy panacea?", *Journal of Economic Geography*, 3(1), pp. 5–35. doi: 10.1093/jeg/3.1.5.

Massaro, M., Dumay, J. and Bagnoli, C. (2019). "Transparency and the rhetorical use of citations to Robert Yin in case study research", *Meditari Accountancy Research,* 27(1), pp. 44-71. doi: 10.1108/MEDAR-08-2017-0202

McCann, P. (2008). "Agglomeration Economics, Handbook of Research on Cluster Theory". Edward Elgar Publishing. Available at: https://www-elgaronline-com.ludwig.lub.lu.se/view/9781845425166.00008.xml (Accessed: 25 January 2021).

McGuire, J. and Dow, S. (2003). "The persistence and implications of Japanese keiretsu organization", *Journal of International Business Studies*, 34(4), pp. 374–388. doi: 10.1057/palgrave.jibs.8400038.

McGuire, J. and Dow, S. (2009). "Japanese keiretsu: Past, present, future", *Asia Pacific Journal of Management*, 26(2), pp. 333–351. doi: 10.1007/s10490-008-9104-5.

McKinsey Global Institute. (2017). "Innovation without borders: Meeting the promise of globalized R&D". Available at: https://www.mckinsey.com/business-functions/operations/our-

insights/innovation-without-borders-meeting-the-promise-of-globalized-rd (Accessed: 24 February 2021).

METI. (no date). "Industrial Cluster Policy". Available at: https://www.meti.go.jp/english/policy/sme_chiiki/industrial_cluster_en.html (Accessed: 18 February 2021).

Meyer, K. E., Wright, M. and Pruthi, S. (2009). "Managing knowledge in foreign entry strategies: a resource-based analysis", *Strategic Management Journal (John Wiley & Sons, Inc.)*, 30(5), pp. 557–574. doi: 10.1002/smj.756.

Mudambi, R. and Santangelo, G. D. (2016). "From Shallow Resource Pools to Emerging Clusters: The Role of Multinational Enterprise Subsidiaries in Peripheral Areas", *Regional Studies*, 50(12), pp. 1965–1979. doi: 10.1080/00343404.2014.985199.

Mycronic. (2021). "Year-end Report January-December 2020". Available at: https://vp188.alertir.com/afw/files/press/mycronic/202102096519-1.pdf (Accessed: 10 May 2021).

Mycronic. (no date). "Mycronic in brief, Mycronic". Available at: https://www.mycronic.com/en/about-mycronic/in-brief/ (Accessed: 21 April 2021).

Nederlands Enterprise Agency. (2018). "Sector Report: Pharmaceuticals and Regenerative Medicine". Nederlands Enterprise Agency. Available at: https://www.rvo.nl/sites/default/files/2018/07/sector-report-pharmaceuticals-and-regenerative-medicine-in-the-kansai-region-of-japan.pdf (Accessed: 12 April 2021).

Nielsen, B. B. and Nielsen, S. (2011). "The role of top management team international orientation in international strategic decision-making: The choice of foreign entry mode", *Journal of World Business*, 46(2), pp. 185–193. doi: 10.1016/j.jwb.2010.05.003.

Patel, P. C. *et al.* (2014). "Beating competitors to international markets: The value of geographically balanced networks for innovation", *Strategic Management Journal*, 35(5), pp. 691–711. doi: https://doi.org/10.1002/smj.2114.

Piab. (no date). "About us". Available at: https://www.piab.com/inside-piab/about/ (Accessed: 6 April 2021).

Porter, M. E. (1990). "The competitive advantage of nations". Reprinted. Houndmills: Macmillan.

Rahiminejad, S. and Zaborowska, N. (2019). "A Swedish Presence ”A case study of Swedish companies in Japan””".

Sandvik Coromant. (no date). "Om Sandvik Coromant, Sandvik Coromant". Available at: https://www.sandvik.coromant.com/sv-se/aboutus/pages/default.aspx (Accessed: 23 April 2021).

Sandvik Group. (2021). "Annual Report 2020". Available at: https://www.annualreport.sandvik/en/2020/operations/sandvik-manufacturing-and-machining-solutions/overview.html (Accessed: 23 April 2021).

Sandvik Group. (no date). "Metal-cutting and digital manufacturing solutions, Sandvik Group". Available at: https://www.home.sandvik/en/products-services/metal-cutting-and-digital-manufacturing-solutions/ (Accessed: 23 April 2021).

Saunders, M., Lewis, P. and Thornhill, A. (2009). "Research Methods for Business Students". Pearson Education.

SECO. (no date). "Company profile ". Available at: https://www.secotools.com/article/702 (Accessed: 13 April 2021).

Sedita, S. R., Caloffi, A. and Belussi, F. (2013). "Heterogeneity of MNEs entry modes in industrial clusters: an evolutionary approach based on the cluster life cycle model". Barcelona: DRUID Society Conference. Available at: https://conference.druid.dk/acc_papers/hbjl9vrx0uelu5nf9ks5imh0t9oa.pdf.

Shen, Z. and Puig, F. (2018). "Spatial Dependence of the FDI Entry Mode Decision: Empirical Evidence From Emerging Market Enterprises", *Management International Review*, 58(1), pp. 171–193. doi: 10.1007/s11575-017-0332-0.

Sheppard, V. (2020). "CHAPTER 3: DEVELOPING A RESEARCH QUESTION", in *Research Methods for the Social Sciences: An Introduction*. BC Campus. Available at: https://pressbooks.bccampus.ca/jibcresearchmethods/part/chapter-3-developing-a-research-question/ (Accessed: 25 February 2021).

SIIQ, F. (2017). "Silicon Island Kyushu - Map of Major Semicknductor Companies in Kyushu". METI Kyushu, p. 21. Available at: https://www.kyushu.meti.go.jp/report/170824/sik_map_en.pdf.

Slepniov, D., Wæhrens, B. V. and Johansen, J. (2014). "Dynamic roles and locations of manufacturing: Imperatives of alignment and coordination with innovation", *Journal of Manufacturing Technology Management*. doi: 10.1108/JMTM-10-2013-0142.

Sölvell, Ö. and Zander, I. (1995). "Organization of the Dynamic Multinational Enterprise: The Home-Based and the Heterarchical MNE", *International Studies of Management & Organization*, 25(1/2), pp. 17–38.

Tan, D. and Meyer, K. E. (2011). "Country-of-origin and industry FDI agglomeration of foreign investors in an emerging economy", *Journal of International Business Studies*, 42(4), pp. 504–520. doi: 10.1057/jibs.2011.4.

Thomas, D. C. and Peterson, M. F. (2015). "Cross-cultural management: essential concepts". Third Edition. Thousand Oaks, CA: SAGE.

Tillväxtanalys. (2010). "Nationell klusterutveckling i andra länder". 2010:124. Available at: https://www.tillvaxtanalys.se/publikationer/rapport/rapportserien/2010-05-27-nationell-klusterutveckling-i-andra-lander.html.

Toyota. (2020). "Toyota to Build Prototype City of the Future, Toyota Motor Corporation Official Global Website". Available at: https://global.toyota/en/newsroom/corporate/31171023.html (Accessed: 4 March 2021).

Toyota Times. (2021). "Woven City Construction Kicks Off: Akio's Promise at Groundbreaking Ceremony", 23 February. Available at: https://toyotatimes.jp/en/insidetoyota/120.html?utm_campaign=202102&utm_medium=cpc&utm_source=wovencity (Accessed: 5 March 2021).

Tsukuba University. (no date). "Campus on Tsukuba Science City - University of Tsukuba". Available at: https://www.tsukuba.ac.jp/en/about/outline-tsukuba/ (Accessed: 21 April 2021).

US News. (no date). "Top Clinical Medicine Universities in Japan | US News Best Global Universities". Available at: https://www.usnews.com/education/best-global-universities/japan/clinical-medicine (Accessed: 9 April 2021).

Vicente, J. (2018). "A Brief History of Cluster Theory", in Vicente, J. (ed.) *Economics of Clusters: A Brief History of Cluster Theories and Policy*. Cham: Springer International Publishing, pp. 5–20. doi: 10.1007/978-3-319-78870-8_2.

World's Top Exports. (2020). "Sweden's Top 10 Exports, World's Top Exports". Available at: http://www.worldstopexports.com/swedens-top-10-exports/ (Accessed: 24 February 2021).

World's Top Exports. (2021). "Japan's Top 10 Exports, World's Top Exports". Available at: http://www.worldstopexports.com/japans-top-10-exports/ (Accessed: 24 February 2021).

Yamawaki, H. (2002). "The Evolution and Structure of Industrial Clusters in Japan", *Small Business Economics*, 18, pp. 121–40. doi: 10.1023/A:1015134028335.

Yao, G. (2018). "SEMI China Delegation Searches for the Secret of Japan's "Silicon Island"". Available at: https://www.semi.org/en/blogs/technology-trends/semi-china-delegation-searches-for-the-secret-of-japans-silicon-island (Accessed: 27 April 2021).

Yin, R. K. (2014). "Case study research: design and methods". 5th ed. London: SAGE.