



UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

Master of Science in International Business and Trade

*Foreign Direct Investment (FDI) and
the Life Science Industry in the Gothenburg Region*

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Abstract

This study aimed to identify why foreign-owned life science companies decide to locate abroad and also to identify the challenges that the companies experience. The Gothenburg region was chosen to investigate as a practical case. The study was performed through a qualitative study conducted through primary data (interviews) and secondary data. From the organization Business Region Gothenburg (BRG), we received data of foreign-owned life science companies located in the Gothenburg region.

The literature review was mainly based on Dunning's (2009) four FDI location motives; resource seeking, market seeking, efficiency seeking, and strategic asset-seeking. Also, the challenges that companies may experience abroad were investigated. Our findings concluded that most of the companies mainly located themselves in the region due to market seeking and strategic asset-seeking motives. This was done mainly to increase their sales or to acquire knowledge and technological capabilities.

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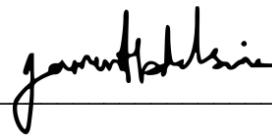
We would also like to thank Business Region Gothenburg for providing the databases to analyze the companies in the region. Lastly, we would like to express great appreciation and gratitude for the time spent by the companies that participated; without them, the study would not have been possible.

Keywords: Life Science, FDI, Medical technology, Biotechnology, Pharmaceuticals, Motives, Gothenburg region, West Sweden.

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List of abbreviations:

BRG - Business Region Gothenburg

R&D – Research & Development

VGR - Västra Götalandsregionen

List of tables:

Table 1: Dunning's Four FDI Motives.....	7
Table 2: Summary of our literature review	17
Table 3: Companies included in the sample, with SNI codes and the life science directory...23	
Table 4: Interview information of the Selected Companies	25
Table 5: Overview of the Norwegian companies and their activities	29
Table 6: Overview of the Danish companies and their activities	29
Table 7: Overview of the Finnish companies and their activities	30
Table 8: Overview of the British companies and their activities	30
Table 9: Overview of the French companies and their activities	30
Table 10: Efficiency seeking companies	41
Table 11: Strategic asset-seeking companies	45
Table 12: Summary of our findings	51
Table 13: Companies' strategies	53
Table 14: Motives simplified	54

Table of Contents

1. Introduction	1
1.1. Background	1
1.1.2. Foreign Direct Investment (FDI).....	1
1.1.3. Life Science Industry.....	1
1.2. Problem	3
1.3. Research Purpose	4
1.4. Research Questions	4
1.5. Delimitations	4
2. Literature Review	5
2.1. Theories about Internationalization	5
2.2. OLI Paradigm (OLI)	6
2.3. Location FDI Motives and Challenges	6
2.3.1. Resource seeking.....	7
2.3.1.1. Investment Incentives	8
2.3.1.2. Infrastructure.....	8
2.3.1.3. Challenges	9
2.3.2. Market seeking.....	9
2.3.2.1. Challenges	10
2.3.3. Efficiency seeking.....	10
2.3.3.1. Cost-Efficiency.....	11
2.3.3.2. Supply Chain Restructuring	11
2.3.3.3. Efficient Clusters	11
2.3.3.4. Challenges	12
2.3.4. Strategic asset-seeking.....	12
2.3.4.1. Type of Research Investment	13
2.3.4.2. Knowledge-Sharing in Collaborations	14
2.3.4.3. Highly Skilled Labor Market.....	15
2.3.4.4. Challenges	16
2.4. Summary	17
3. Method	19
3.1. Research Approach	19
3.2. Research Strategy	20
3.3. Multiple Case Study	21
3.4. Research Selection	21
3.5. Type of Data	23
3.5.1. Primary Data.....	23
3.5.2. Secondary Data.....	25

3.6. Quality of the Study	26
3.6.1. Reliability.....	26
3.6.2. Validity.....	27
3.6.3. Generalizability.....	28
3.7. Ethics.....	28
3.8. Overview of the Companies.....	28
3.8.1. Norway.....	30
3.8.1.1. Navamedic AB.....	30
3.8.1.2. Observe Medical AB.....	31
3.8.1.3. Touchpoint Medical Nordic AB.....	31
3.8.2. Finland	32
3.8.2.1. Histolabs Products AB	32
3.8.2.2. Optergo AB	32
3.8.3. Denmark	33
3.8.3.1. AB Previa	33
3.8.3.2. Coloplast AB.....	33
3.8.3.3. Coremed Simonsen & Weel AB	33
3.8.3.4. Guldmann Sverige AB	33
3.8.3.5. Oticon Medical AB	34
3.8.4. United Kingdom	35
3.8.4.1. Albireo AB	35
3.8.4.2. Cochlear Nordic AB.....	35
3.8.4.3. NEOSS AB.....	35
3.8.5. France.....	36
3.8.5.1. BioMérieux Sweden AB	36
3.8.5.2. Takara Bio Europe AB.....	36
4. Empirical Result.....	37
4.1. Location FDI Motives and Challenges	37
4.1.1. Resource seeking.....	37
4.1.1.1. Investment Incentives	37
4.1.1.2. Infrastructure.....	38
4.1.1.3. Challenges	38
4.1.2. Market seeking.....	39
4.1.2.1. Challenges	40
4.1.3. Efficiency seeking.....	41
4.1.3.1. Cost-Efficiency.....	41
4.1.3.2. Supply Chain Restructuring	42
4.1.3.3. Efficient Clusters	43
4.1.3.4. Challenges	43
4.1.4. Strategic asset-seeking.....	44
4.1.4.1. Type of Research Investment	44
4.1.4.2. Knowledge-Sharing in Collaborations	45
4.1.4.3. Highly Skilled Labor Market.....	47
4.1.4.4. Challenges	48
4.2. Country Origin.....	49
4.2.1. Nordic Countries	49
4.2.2. United Kingdom	49
4.2.3. France.....	50

4.3. Summary	51
4.3.1. Advantages and Challenges	51
4.3.2. Country Origin	51
5. Analysis	52
5.1. Location FDI Motives and Challenges	52
5.1.1. Resource seeking.....	55
5.1.1.1. Investment Incentives	55
5.1.1.2. Infrastructure.....	55
5.1.1.3. Challenges	56
5.1.1.4. Overall Remarks	57
5.1.2. Market seeking.....	58
5.1.2.1. Challenges	59
5.1.2.2. Overall Remarks	60
5.1.3. Efficiency seeking.....	60
5.1.3.1. Cost-Efficiency.....	60
5.1.3.2. Supply Chain Restructuring	61
5.1.3.3. Efficient Clusters	62
5.1.3.4. Challenges	63
5.1.3.5. Overall Remarks	64
5.1.4. Strategic asset-seeking.....	64
5.1.4.1. Type of Research Investment	64
5.1.4.2. Knowledge-Sharing in Collaborations	66
5.1.4.3. Highly Skilled Labor Market.....	67
5.1.4.4. Challenges	68
5.1.4.5. Overall Remarks	69
5.2. Country Origin.....	69
5.2.1. Nordic Countries	69
5.2.2. United Kingdom	70
5.2.3. France.....	70
6. Conclusion	71
6.1.1. Empirical findings	71
6.1.2. Theoretical Contributions	72
6.2. Managerial Implications	74
6.3. Limitations.....	75
6.4. Future Research	76
7. Bibliography.....	77
Appendix 1	87
Appendix 2	89

1. Introduction

We will now present the introduction chapter. We will first provide a background of the chosen topic. Thereafter the problematization will be explained followed by two research questions. Lastly, delimitations will be highlighted to narrow the topic.

1.1. Background

Today, many firms strive to have an international presence, even if this brings many challenges (Zain and Ng, 2006). Every firm that goes on the line of internationalization also ventures the journey into the unknown (Eriksson et al., 2000). Still, the internationalization of firms is not a recently discovered phenomenon. It has been around since the Phoenicians, then increased during the colonial area and further accelerated tremendously after the Second World War (Törnroos, 2002). There can be many different incentives for a firm to engage in an internationalization process. This will be explored in this study, looking at the reasons that companies invest abroad.

1.1.2. Foreign Direct Investment (FDI)

Foreign direct investment (FDI) is a type of internationalization process which will be the focus of this study. FDI is when a company enters a foreign market directly. This can be accomplished through acquisitions, mergers (Alfaro et al., 2004), or greenfield investments (Neto et al., 2008). Acquisitions are when a company purchases another company and takes control over its operations. Mergers are when companies partner with another company and share responsibility (Alfaro et al., 2004). A greenfield investment is when a company establishes its own facility (Neto et al., 2008).

1.1.3. Life Science Industry

The life science industry consists of biotechnology, medical technology, and pharmaceuticals and is a knowledge-intensive industry (Grillitsch et al., 2019). Since 2010, the life science industry has accounted for more than \$230 billion of the worldwide greenfield FDI projects (Wassmansdorf, 2021). According to Dicken (2015), global high-tech industries (e.g., manufacturing of computers, pharmaceutical products, optical products, and pharmaceutical preparations) face difficulties in short product life cycles, international competition, and rapid

changes in their customers' demand. In a report by KPMG (2018), it is stated that Europe is the second-largest market for medicine which makes Europe a lucrative market for life science companies.

Within the life science sector in Western Sweden, around 33% of the companies are involved with medical technology, 22% are in biotechnology and pharmaceuticals, and 45% are involved with other types of life science areas. In Sweden, the life science sector is seen as an essential contributor to knowledge-intensive employment, the Swedish export, and it generates high value-added products (Vinnova, 2014). KPMG's (2018) report highlights that Sweden is ranked high in therapeutic clusters and medical technology.

In the Gothenburg region, some developments are occurring in the life science industry. There has been an increase in investors in the region due to digital health and medical technology (Sahlgrenska Science Park, 2018). The Chalmers University of Technology has made a research center at Lindholmen for artificial intelligence (Chalmers, 2019). Moreover, there is currently a project in development called Gothenburg CoValley, which will be a cluster for life science innovations and is expected to be complete by 2022 (GoCo, 2021). Also, there are several universities in the region for life science. For example, the Sahlgrenska Life project, where Sahlgrenska Academy, a faculty of the University of Gothenburg, and Sahlgrenska University Hospital are collaborating. Their goal is to strengthen their knowledge in the life science industry (Business Region Gothenburg, 2021a).

There is an organization called Business Region Gothenburg (BRG) that focuses on developing the industries in the region. They collaborate with companies and investors and assist them in succeeding in the Gothenburg region. One of BRG's focuses is the life science industry, and they aim to increase its competitiveness. They are part owners of Sahlgrenska Science Park to enhance the innovation development in the life science industry (Business Region Gothenburg, 2021b).

We have been contacted by BRG to study FDI engaged by foreign-owned companies from the life science industry. We have received a list of companies in the Gothenburg region to research inward FDI in the life science industry.

1.2. Problem

Countries may have difficulty attracting FDI in the life science industry. The Swedish government aims to increase the number of life science companies in Sweden. Due to the increase in health challenges, they have developed a national life science strategy to improve the industry (Swedish Government, 2019). Currently, BRG is working on enhancing the region's international reputation. Diamontoudis (2021) argued that there might be the challenge that clusters around the world are competing with each other. Attracting FDI can be difficult because of international competition. Countries are competing with each other to attract foreign-owned companies to enter. Therefore, it is crucial to identify the location factors that companies consider when investing abroad.

According to Zeller and Van-Hametner (2018), there is limited research regarding the motives for direct investments in certain industries. They studied the life science industry in Austria and believed there was a research gap regarding the motives of outward and inward FDI. Companies may be working to build their competitive advantage and look for locations to find valuable resources. The type of factor can depend on the company's aims. Belderbos et al., (2014) studied FDI in R&D. They suggested that for future research, it would be beneficial to examine other factors besides the knowledge available that can influence companies to engage in FDI. Thus, it appears that there is limited research on the reasons for FDI. This will be explored in this study by identifying several location factors that may impact companies to invest abroad.

When we reviewed the literature, it was challenging to find research regarding both the advantages and disadvantages of a location for life science companies. Also, there was scarce research about the life science industry in Sweden. The articles that we found only focused on other Swedish regions such as Skåne and Stockholm and not on Gothenburg. Thus, it appears that there is a research gap regarding the life science industry in the Gothenburg region. Moreover, Dunning (2009) has discussed that international business scholars should pay more attention to the location of activities in the value chain. This study will explore companies' activities in Gothenburg and where their other activities are located in the world. The companies selected are from five countries; Norway, Finland, Denmark, France, and the United Kingdom. This selection was made because these were the countries BRG had an interest in.

1.3. Research Purpose

This study aims to explain the establishment of foreign-owned companies in the Gothenburg region. The purpose is to gain a deeper understanding of life science companies' reasons to locate in the Gothenburg region. The challenges that companies experience will also be investigated. The aim is to highlight them to provide suggestions in the study on how the Gothenburg region can improve its competitiveness in the life science industry.

1.4. Research Questions

- *What are the factors that motivate life science companies to invest in a foreign market?*
- *What challenges do life science companies experience when they invest in a foreign market?*

To answer these research questions, we are going to study foreign-owned companies in the Gothenburg region. The first question will focus on the location factors that encourage foreign companies to be located abroad. It is significant to identify why companies choose to be in a location to develop a strategy to attract companies to the market. The second question will be about the challenges that foreign companies experience in the region. This can be helpful to regions because they will have an insight on which aspects to improve to develop their reputation and increase FDI in the life science industry.

1.5. Delimitations

The focus of this study will only be concentrated on the Gothenburg region. It will be purposely limited to one location. If all the regions of Sweden were explored, then there would not be a narrow focus for the study. Moreover, the thesis will only be focused on the life science sector. Only companies from these business segments; biotechnology, medical technology, and pharmaceuticals, will be included.

Moreover, only foreign-owned companies will be included because inward FDI will be studied. Therefore, Swedish-owned companies that are located in the Gothenburg cluster will not be explored. Since we have received databases with five European countries; France, Norway, Denmark, Finland, and the United Kingdom, the geographical scope will be limited to them as

the selection is based on the data received from BRG. These five European countries will be the focus for inward FDI in the region.

2. Literature Review

This chapter will provide an overview of the chosen literature for this study. Literature from various scholars has been organized under Dunning's four FDI motives (2009).

2.1. Theories about Internationalization

Several authors have discussed internationalization. There is the resource-based view (RBV) by Barney (1991), which explains that companies seek resources to develop competitive advantages. If the resources are rare, it might lead to a competitive advantage. There is also the Uppsala model (UM) presented by Johanson & Vahlne (1977). This theory explains how companies first choose to expand by exporting to markets with a close physical distance (physical distance can be factors such as market knowledge, social and economic costs, and as language barriers). As the market knowledge increases, the market commitment increases leading to the companies' own manufacturers in the host country. This theory was then criticized, among them by Johanson and Mattson (1988) which argued that when a company enters a foreign market, it automatically develops business relationships in networks within these markets. They therefore stated that the UM undervalued the importance of network positions within the internationalization process.

This led to the revisited UM in 2009. Johanson and Vahlne (2009) state that business networks have become networks of relationships that then link firms together in complex ways. Relationships help companies to build trust and commitment as well as it gives the opportunity of learning. If a firm does not participate in network positions, the firm will by time suffer from *liability of outsidership*. But when the firm becomes an "*network insider*", the firm has the opportunity to acquire and create knowledge which then will lead to competitiveness within the new market.

Moreover, there is also the born global theory which explains how companies are early adopters of internationalization. They are either global from the beginning of the establishment or start their international expansion just after their founding. They are

innovative and have flexibility that make them capable of internationalization (Knight and Cavusgil, 2004).

Thus, we acknowledge that various theoretical frameworks can be followed. However, for this study, Dunning's theoretical framework will be adopted, which will be discussed further below. Our main aim is to understand the location advantages that influence companies to choose a location.

2.2. OLI Paradigm (OLI)

Dunning has developed the eclectic paradigm and explained three advantages that companies consider deciding if they should pursue FDI. These are ownership, location, and internalization advantages. Ownership advantages are the assets that a company currently holds that could make them competitive in the market. Location advantages are the benefits of a location that companies identify. Internalization advantages are the benefits of conducting the activities in-house rather than outsource (Dunning, 2009). It has been argued by Sass (2012) that if a company does not have the internalization advantage, they might decide to export or be involved with franchise or license agreements. Companies may still want to benefit from the location advantages, and they might enter a location without engaging in foreign direct investment. However, the focus of this study is mainly on companies engaging in foreign direct investment.

2.3. Location FDI Motives and Challenges

In 1998, Dunning added several motives to the "L" of the OLI paradigm. The location advantages are the reasons that a location is selected. He added factors such as; resource seeking, market seeking, efficiency seeking, and strategic asset-seeking to identify the location determinants (Wilson and Baack, 2012). For this thesis, the focus will be mainly on the location advantages and how it affects a company's internationalization process.

Dunning's framework will be used for guidance for our research in studying the reasons that foreign-owned companies are established in the Gothenburg region. Aside from the valuable resources, the location could have shortcomings that make a company decide not to locate all their activities in the area. The challenges will be organized under these four motives to

compare with the location advantages. Table 1 below summarizes Dunning's four FDI motives (2009).

Table 1: Dunning's Four FDI Motives

Dunning's FDI Motives			
Resource seeking	Market seeking	Efficiency seeking	Strategic asset-seeking
<ul style="list-style-type: none"> - Natural resources at a lower cost that are not available in the home country. - Investment incentives (tax reductions and financial grants) - Infrastructure to have access to resources. 	<ul style="list-style-type: none"> - Expand to new markets and increase in sales. 	<ul style="list-style-type: none"> - Cost-efficiency, the aim is to reduce the overall costs in the supply chain - Spread the risk across various locations. - Supply chain restructuring - Efficient market, the government is putting effort to enhance society's skills. Also, that there is an efficient industry consisting of clusters and science parks. 	<ul style="list-style-type: none"> - Strategic assets such as knowledge and technological capabilities for the company to grow long-term.

Source: Dunning (2009).

2.3.1. Resource seeking

Dunning (2009) explained how companies choose to invest abroad to obtain resources at a lower cost or not available at the home market. These resources can be characterized as unskilled or semi-skilled labor and natural resources. Dunning has also discussed that investment incentives also fall under this category. Governments' financial efforts to attract FDI, such as tax reductions and financial grants, have been classified under that motive. Thus, it could be that financial opportunities could influence FDI into the region. Moreover, Dunning has placed physical infrastructure under this motive, as it affects how companies access their resources. Lastly, Dunning revised his theoretical framework in 2009 and he acknowledged that this motive has decreased in importance as seeking knowledge is occurring more by companies.

2.3.1.1. Investment Incentives

According to KPMG (2018), Europe could have several financial benefits. There was a research and innovation program called Horizon 2020 from 2014 to 2020 where the European Union funded life science firms with nearly €80 billion. A new Horizon program occurred in 2021 and runs until 2027 with the same goals but with a larger budget of €95.5 billion (European Commission, 2021). The European Investment Bank (EIB) is the world's biggest non-profit multilateral financial institution (EIB, 2019; 2021). The bank supports public and private sector organizations with research and innovation loans (KPMG, 2018). European Investment Fund (EIF), which is a part of the EIB Group (EIF, 2021), works with a wide range of financial intermediaries to support financing for SMEs and small mid-caps across Europe (KPMG, 2018). Lastly, Europe InnovFin, a joint initiative between EIB and EIF in cooperation with the European Commission under Horizon 2020 (EIB, 2021). Europe InnovFin provides packages of financing tools in the forms of loans and guarantees to equity-funding (KPMG, 2018).

However, funding in Sweden for life science companies has not been significant. According to Styhre (2015), there is a shortage of venture capitalists in Sweden, making it difficult for life science companies to progress. However, a study by Sahlgreńska Science Park (2018) has discussed that recently, there has been a change in investments in the life science industry. There is a growing capital, which may be because of digitalization in health care. As a result, there are more opportunities for companies to connect with investors.

Furthermore, tax environments have always been a significant factor affecting life science companies (KPMG 2018; Johanson and Johanson, 2019). Life science companies need to weigh up many different aspects that will influence the company, such as the ordinary tax rulings and income tax rates, transfer pricing, and double taxation treaty networks. In Sweden, an employer has the right to deduct from the employer's contributions with 10% if the employer works within the field of R&D (Skatteverket, 2014).

2.3.1.2. Infrastructure

Dunning (2009) has argued that infrastructure can be a location factor and part of the resource seeking motive. He has discussed that companies want good infrastructure to have access to resources. It could be argued that Sweden has an efficient infrastructure. In the report by KPMG

(2018), Sweden is in the *Quality of overall infrastructure* ranked at 14th among the European countries. Moreover, SwedenBIO, a non-profit organization that works on enhancing the life science industry, has argued that Sweden is a beneficial location for manufacturing. They have argued that along with the competence available, there are rarely any disruptions in the country due to natural causes or political issues. They have stated that several companies in the life science industry have established their production in Sweden (SwedenBIO, 2021). Gothenburg is considered a beneficial location for infrastructure. Gothenburg's port is the largest in Scandinavia, where 30% of the international trade passes through there (The Port of Gothenburg, 2021).

In regard to infrastructure, the convenience of international travel can be viewed as a benefit. In the study by Braunerhjelm and Helgesson (2007), they looked at Medicon Valley, a cluster that spans from eastern Denmark to southern Sweden. In the Danish part of the Medicon Valley, they had an advantage over the Swedish part because they had the international Danish (Kastrup) airport (Braunerhjelm and Helgesson, 2007). There is the Gothenburg-Landvetter Airport that is viewed as beneficial for international trade (Sweden, 2021).

2.3.1.3. Challenges

Regarding the study by Braunerhjelm and Helgesson (2007), they also discussed that Sweden has a higher income tax than Denmark, making the Danish side of the cluster more attractive to employees. However, recently in 2014, the Swedish government has put a 10% reduction on research employees. There is also a tax reduction on foreign employees that move to Sweden for research in the life science industry (Sahlgrenska Science Park, 2018).

2.3.2. Market seeking

Dunning (2009) explains that companies may aim to expand to other foreign markets. A study by Andersson et al., (2013) demonstrated that firms might be entering locations for marketing purposes. They conducted a study about the medical technology cluster in the Rhone-Alpes region in France and observed four French companies. They argued that the companies were motivated to expand to foreign markets to increase their sales.

Moreover, the size of the home market can play an impact on investing abroad. Sass (2012) observed that the smallness of a domestic market motivates companies to seek other markets abroad. Their study was about Hungarian medical technology companies and their

internationalization process. Their research found that the companies engaged in FDI by establishing representative offices in other markets. He concluded that companies did not favor moving their production abroad.

Another study conducted by Pisoni et al., (2010) came to a similar conclusion that companies may enter locations only for marketing reasons. They studied MNCs in an Italian biotechnology cluster. They concluded that the foreign subsidiaries were located there for their marketing activities rather than to engage in R&D. It appeared that companies selected Italy for a marketing opportunity instead of access for research. Only 20% of the foreign MNCs in the sample engaged in collaborations with universities and research centers. This may be explained by the limited amount of resources available in Italy. It appeared that there was a limited number of incubators which may indicate a possible explanation for the lack of activity in research.

This also occurred in the study by Zeller and Van-Hametner (2018). They studied the Austrian market and discovered that one of the reasons that foreign companies entered was to establish sales offices. They concluded that foreign companies mainly invest in Austria for marketing and not for production or research purposes. While a few companies entered to seek knowledge, the main reasoning was to expand in sales. Regarding production, the scholars concluded that companies preferred Eastern Europe instead of Austria. Therefore, it appears that life science companies may enter some locations only to enhance their marketing rather than other activities. The resources available in the location can impact the type of activities that companies engage in.

2.3.2.1. Challenges

There can also be issues in that the market is small for an expansion of sales. For instance, in the study by Grillitsch et al., (2019), one interviewee complained that the conferences were mainly about the Swedish market. Since they targeted the global market, they would have liked it if there was a discussion about more countries.

2.3.3. Efficiency seeking

According to Dunning (2009), this motive focuses on cost reduction. The companies seek to gain economies of scale and maintain risk diversification. Also, due to the increase in the need for knowledge, companies have searched for efficient clusters consisting of science parks.

Also, when governments put effort into increasing the efficiency of the society, it can influence efficiency seekers.

2.3.3.1. Cost-Efficiency

Health economics is a theory that may impact life science companies and motivate companies to be efficiency seekers. This theory is about healthcare-seeking efficiency and can potentially affect the competitiveness of companies. Healthcare conducts several economic analyses to select the outcome, such as cost-minimization, cost-effectiveness, cost-utility, and cost-benefit. For instance, the cost-minimization analysis may be performed where the cheapest option is selected, given that it provides the same health benefits as the competitors (Haycox, 2009). It may be that products will be analyzed to determine if they should be included in the healthcare system. Thus, it may motivate companies to be cost-effective in their value chain to produce the cheapest alternative for the healthcare system.

2.3.3.2. Supply Chain Restructuring

In the study by Zeller and Van-Hametner (2018), they discussed the efficiency seeking motive. They argued that the decision is not always about the actual location but how the business organizes its value chain to be most efficient. They may locate their activities to reorganize their value chain so that it is as efficient as possible. Therefore, it might not be that the actual region affects the company's decision to leave, but rather the locations of the other activities in the value chain. They may be looking to move their R&D to be closer to their production facilities.

2.3.3.3. Efficient Clusters

When Dunning (2009) organized the motives, he argued that in the 1990s, compared to the 1970s, there has been an increase in the need for knowledge. Businesses entered countries that have developed an efficient economy where there is an entrepreneurial environment. Also, the government takes effort in enhancing society's skills. He has thus argued that when the government focuses on improving the economy, it can attract companies to invest in the location. He has also discussed that efficiency seekers might enter due to agglomeration economies. It can be efficient to be near other companies from the same industry, leading to an increase in productivity.

This was argued by other scholars that studied the life science industry. Companies may enter locations that have other companies from the same industry. This strategy may be adopted because, in biotechnology, new knowledge is more likely to occur from several companies than independently (Powell et al., 2002). It is also possible that foreign companies may look for locations where other foreign companies are present (Devereux et al., 2007). This can be supported by Head et al., (1999) that argues that since foreign companies have less local knowledge about the success of a region, they look to the presence of foreign companies as an indication of profitability. According to a report by Sahlgrenska Science Park (2018), large companies have established themselves in the Gothenburg region, which boosts the reputation.

2.3.3.4. Challenges

Zeller and Van-Hametner (2018) have explained that pharmaceutical companies usually do not build their own production facilities because it is expensive. They tend to work with contract manufacturers where they place orders. The scholars found that Austrian companies enter countries by licensing their products, which is a way to distribute without building a distribution network. Therefore, it may be too costly to establish their own greenfield investments in a country. Other entry modes may be adopted to enter a foreign country. Thus, companies may enter a foreign market but not through direct investments. This is important to consider because it could highlight the challenges that companies face that prevent them from engaging in foreign direct investments.

2.3.4. Strategic asset-seeking

Dunning (2009) explains that companies may enter foreign countries to acquire strategic assets. They are intangible assets such as knowledge and technology capabilities. The companies' goal is to build their competitive advantage and contribute to their long-term strategy. Dunning revised the motives and discussed that in the 1990s, there was a growing trend for strategic asset-seeking. Companies are adopting this motive when they are seeking knowledge assets. He further explains that along with this motive, there is an increase in mergers and acquisitions, mainly in knowledge-intensive sectors. Moreover, Knoerich (2020) discusses that strategic asset-seeking is often done through acquisitions, but it can also be done through greenfield investments. He discusses that technological knowledge can be adopted through collaborations with universities or recruiting highly skilled people.

2.3.4.1. Type of Research Investment

This section will include literature about companies establishing an R&D abroad. Zeller and Van-Hametner (2018) studied companies that were seeking knowledge. They studied the Austrian pharmaceutical industry. They concluded that the largest pharmaceutical companies built R&D centers in Austria. Companies recognized the potential in Austria because of a growing presence of international contract research organizations (CROs). These organizations are beneficial because they conduct clinical trials and provide research support to companies. However, the researchers have also observed that many Austrian companies are moving away from the cluster. They engage in outward FDI in other geographical areas such as Eastern Europe for their research activities to reduce their costs.

Most of the companies established themselves in Austria for marketing purposes rather than to conduct research. Moreover, there was a study by Conle and Taube (2011) that looked at the biotechnology cluster in China. They have referred to Dunning's framework and have seen that foreign companies have mainly been in China for market seeking to be focused on the domestic market. However, there have been some companies that have started to become strategic asset-seekers. They have found that some pharmaceutical companies have opened up an R&D center in Shanghai.

Furthermore, Zeller conducted a previous study in 2004 that also looked at R&D activities in the pharmaceutical industry. He investigated Swiss companies that established themselves in the U.S. and made collaborations with biotechnology firms. He discussed that R&D for the pharmaceutical industry was only located in a few countries. There are only certain locations that are selected for research activities. He argued that companies tend to choose knowledge-intensive sites to reduce their risk. It allows them to be near the local resources, such as providing access to the local universities.

A study by Gugler et al., (2015) observed the internationalization of pharmaceutical companies established in Switzerland. They have referred to Dunning's framework in that strategic asset-seeking is increasing because companies are seeking knowledge. They have argued that clusters can be attractive for companies that are strategic asset-seekers. Their findings are that some of the companies established in Switzerland have engaged in R&D activities abroad to enhance their global knowledge.

The value of locating R&D in foreign locations has been expressed in literature. Von Zedtwitz and Gassman (2002) have discussed a shift from home-base-exploiting to home-base-augmenting in R&D, which is that there is reverse knowledge transfer from the foreign subsidiaries to the headquarters. It has been recognized that overseas R&D can lead to innovations due to the foreign knowledge acquired. In the study by Hamida and Piscitello (2013), they looked at Swiss companies that have moved their R&D abroad. Their results demonstrated that pharmaceutical companies often had their R&D in other countries. They have also discussed home-base exploiting and home-base-augmenting like Von Zedtwitz and Gassmann (2002) about home-base-exploiting and home-base-augmenting. Hamida and Piscitello (2013) have concluded that home-based-augmenting can benefit the parent company when acquiring foreign knowledge.

Companies can also enter for research purposes without establishing an R&D center. Duc and Lindeque (2018) claimed that companies could be strategic asset-seekers with low investment into the region. They have found that companies establish a representative office to have a physical presence and access the knowledge in the location. With a representative office, they can collaborate with others in the region. Furthermore, as mentioned before, strategic asset-seekers can also enter through acquisitions. Dunning (2009) has argued that companies may aim to acquire other companies to access their knowledge.

2.3.4.2. Knowledge-Sharing in Collaborations

Braunerhjelm and Helgesson (2007) also recognized that academia plays a role in decision-making. They examined a European cluster called Medicon Valley, which spans from Eastern Denmark to southern Sweden. They concluded that the cluster achieved an international reputation for several reasons. There was the presence of networks between hospitals, universities, and companies which made the location valuable. Companies invested time in academia and viewed their networking efforts as a way to reduce risk and gain more access to knowledge. The biotechnology industry has various risks as it is a long process to be approved for commercialization.

Belderbos et al., (2014) have also concluded that academic strength can motivate companies to invest abroad. They studied foreign manufacturing companies' such as pharmaceuticals, and their location decisions for their R&D. From their empirical results, they learned that

companies locate to foreign markets based on the strength of the academic research in that region. They observed that regions with a high number of PhD university students positively affected the location decisions. They suggested that policies should focus on improving their universities to attract foreign investments. They concluded that academic strength is not measured by publication output alone. Instead, it is also measured by the opportunities available for companies to collaborate or hire PhD individuals. Therefore, it appears that there is a high value placed on the educational nature of the region.

Le Duc and Lindeque (2018) have studied MNEs in Dutch science parks, looking specifically at geographical proximity and its impact. A science park is an organization to increase innovation among businesses (IASP, 2021). They have referred to Dunning's (1998) study where he has argued that companies that are strategic asset-seekers may aim to be in science parks to increase their knowledge. Their findings are that MNEs value science parks because of the scientific knowledge available. Geographical proximity was not viewed as necessary, but it was considered beneficial in their study. They argue that when companies locate near other companies in the science park, there is a higher chance of knowledge sharing. They have argued that if companies seek tacit knowledge, it is more beneficial to have geographical proximity to other companies. Moreover, they have argued that companies tend to enter the market by establishing representative offices. This low organization proximity provides companies access to knowledge. It has been claimed by Duc and Lindeque (2018) that companies may decide to have a physical presence through representative offices or larger R&D offices.

Geographical proximity to other companies can be an advantage in a region. The study from Sahlgrenska Science Park (2018) discussed that the short distances in Gothenburg lead to collaboration, making it a knowledge-based city. However, there can be arguments against the necessity of geographic proximity. In the French biotechnology industry study, it was found that geographic proximity is not considered significant by companies because a lot of their networks are with laboratories abroad (Lemarie et al., 2001).

2.3.4.3. Highly Skilled Labor Market

The search for highly skilled labor can be one factor that affects a company's location decision. In the study by Kimelberg and Nicoll (2012), they looked at medical devices in Massachusetts. While it was not explicitly studying FDI, it analyzed the American firms' considered factors

when moving to Massachusetts. Based on the results, they discovered that the main factor was a skilled labor market. This can be supported by Braunerhjelm and Helgesson's (2007)'s study that studied Medicon Valley, the European cluster which spans from Eastern Denmark to southern Sweden. They also came to a similar conclusion and argued that a highly skilled labor force was one of the reasons that the cluster achieved an international reputation. This was also present in a study by Grillitsch et al., (2019), where they investigated two medical technology clusters (Scania/Sweden) and (Vienna/Austria). In both clusters, some universities and hospitals attracted firms. It was beneficial for the companies to have geographical proximity to qualified staff.

2.3.4.4. Challenges

There has been a decrease in clinical trials in Sweden over the years. This has also been occurring for other Nordic countries and Western Europe. Clinical trials are when companies test their medical products, and they can be both commercial and non-commercial. There has been a shift where companies choose to locate their clinical trials in other locations such as Eastern Europe to reduce their costs (Sandström, 2014). As discussed before, this was also present in Zeller and Van-Hametner's study (2018). Companies chose to conduct their clinical trials in Eastern Europe instead of Austria. Moreover, for large pharmaceutical companies, there can be an issue in Sweden with the schedule or the access to enough test subjects for the clinical trials for large pharmaceutical companies. Since Sweden has a small population, it would need to collaborate internationally to conduct large trials (Sandström, 2014). It has been a challenge for Sweden because the clinical trials are performed in other countries, meaning they have a less competitive advantage with research (Otmani, 2016).

When it comes to collaborations, foreign firms can have a disadvantage over local firms regarding knowledge transfer. Local firms may have better networks which means that they can get more information. Foreign firms can be located in a knowledge-intensive cluster, but knowledge will not be shared if they are missing the connections (Tallman and Chacar, 2011). Moreover, there can be issues when there are many competitors from the same industry in a cluster. A study by Cortes et al., (2017) studied MNEs' subsidiaries in Spain. They discovered that it could lead to a decrease in innovation. MNEs would have to compete for more resources, negatively affecting their development. However, the results were mixed, and they found that knowledge can still be shared and that agglomerations may lead to more innovations.

The quality of life can also play a factor in the decision not to move to a cluster. In a study by Smith (2004), he looked at Oxfordshire and saw that the housing costs discouraged employees from moving to the location and possibly even made them move out. There were also issues with finding available laboratory spaces, and the costs of offices were high. It was concluded that it was an expensive location for companies. While there was potential for growth due to the availability of research, the disadvantages affected the decision-making.

Lastly, Zeller and Van-Hametner (2018) have looked into the pharmaceutical industry. They discussed that companies might resell products instead of manufacturing their own products as they do not have the financial capabilities. Thus, they do not have their own research facilities as their only activity is sales.

2.4. Summary

The summary of our literature review is presented in table 2 below. It includes all the possible location factors that might impact a company's decision-making.

Table 2: Summary of our literature review

Type of FDI	Location Factors Identified
Resource seeking	<ul style="list-style-type: none"> - Reduce costs of natural resources. - Investment incentives e.g., tax reductions and financial grants. - Infrastructure.
Market seeking	<ul style="list-style-type: none"> - Expand to new markets. - Market size.
Efficiency seeking	<ul style="list-style-type: none"> - Reduce the overall costs in the supply chain. - Reconstructing the supply chain. - Contract manufacturers. - Availability of spatial clusters e.g., science parks, cooperation between companies, entrepreneurial environment. - Governments developing the economy, e.g., educational programs.
Strategic asset-seeking	<ul style="list-style-type: none"> - Universities. - Increase in product portfolio. - Companies from the same industry. - Access to highly skilled labor. - R&D facilities.

The advantages and challenges identified in the literature will be summarized in this section. For resource seeking, companies may enter a location to have access to natural resources or

unskilled labor. It can also be for financial grants or to lower their taxes. However, it could be a challenge in the Swedish market that high-income taxes affect recruitment. Also, there is a shortage of funding in the life science industry. However, regarding funding, it appears that the situation in Sweden might change as there is an increase in interest in artificial intelligence and digital healthcare. Lastly, a beneficial infrastructure for trade can be sought by companies.

Regarding market seeking, companies tend to enter foreign markets to increase their sales. However, if a company is considered small, then it is not valuable for sales. For efficiency seekers, they may seek a country with an efficient market, where there is a productive society. Also, it could be for cost-efficiency, as they could be reducing the overall costs in their supply chain. Companies might not enter a location through FDI and instead enter through outsourcing because it is not efficient for them to do their activities in-house. Moreover, efficiency seekers might not choose a country because they are restructuring their supply chain. Their aim could be that their R&D and production facilities are at the same location.

Lastly, for strategic asset-seekers, companies may aim to place their R&D overseas to increase their knowledge. Not all strategic asset-seekers establish an R&D center and may only establish an office abroad. This is to collaborate with universities and companies without having a high investment in the region. Furthermore, companies may enter a location because there is a highly-skilled labor market available. However, a lack of clinical trials could be a challenge for companies entering a location for research. This has been an identified issue in Sweden. Furthermore, if the living costs are high, it can affect recruitment, negatively impacting companies.

3. Method

We will now present the method chapter, which provides insights into how the research was conducted and explanations of certain choices made for this study. First, the research approach is presented, followed by research strategy, data collection, data analysis, quality of the study, and limitations. Lastly, a section of company presentations will be provided.

3.1. Research Approach

An abductive approach has been selected for this study which combines both a deductive and an inductive approach. A deductive approach is where the theoretical framework is tested. However, this approach will not be adopted. It is suggested that it is not appropriate for most qualitative studies. An inductive approach is when empirical data is first collected, and then a theory is developed. This is adopted in qualitative research. It differs from the deduction approach because the theoretical results are produced after the data has been found (Eriksson and Kovalainen, 2015).

As discussed before, abduction is the combination of both approaches. Abduction evaluates the theory and compares it to the empirical data collected. The abduction approach focuses on expanding the current literature and is open to developing new ideas, which is not practiced in deduction. Deduction is only aimed at evaluating the current hypotheses and testing their validity (Eriksson and Kovalainen, 2015). The abduction approach will be taken because of the process that will be adopted. The theoretical framework will be used as a reference to compare the empirical results, and we are open to developing new conclusions. Thus, the abduction method seemed appropriate for this study. The empirical results are expected to contribute to the literature in a new context, exploring the Gothenburg region and the life science sector.

Furthermore, there are several paradigms, such as positivism and interpretivism. Positivism is when future studies can conduct the method and get repeated results. While interpretivism is subjective and it is based on individual experiences and cannot be replicated. In this case, the approach taken will be interpretivism as each company differs regarding their experience in the Gothenburg region. Therefore, different results will be received from each company as it depends on their subjective circumstances. Interpretivism applies to qualitative methods, while

positivism is often for quantitative methods (Bryman and Bell, 2011). Since this is a qualitative study, the interpretivism paradigm applies.

3.2. Research Strategy

For this study, it was decided that qualitative interviews were going to be utilized to collect data. Qualitative interviews often help explore the respondent's views and encourage the respondent to speak freely about the topic. (Bryman and Bell, 2011). A quantitative study was not selected because we aim to gather in-depth information. Since it is an interpretivist paradigm, the information collected will be the company respondent's interpretation of the region's advantages and disadvantages. A quantitative study is often used when a researcher aims to test a hypothesis. With a quantitative method, the questions will be limited to direct questions. Since the aim is to capture explanations for the company's decision-making, this method was not adopted. The respondents would not have the opportunity to elaborate upon the research questions.

However, there are also different interview methods, such as; structured, semi-structured, and unstructured. For this study, a semi-structured interview approach has been utilized. Depending on the company's activities within the Gothenburg Region, different amounts of questions have been formulated. Activities such as only sales, only R&D, or a mix of both. Therefore, the questions have varied between 20 to 25 questions. Some questions have also included sub-questions depending on if the respondent answers 'yes' or 'no' to the main question. The semi-structured method was applied because the authors did not want to be constrained to the prepared questions. The semi-structured approach allows the authors to guide the interview within a certain time frame. Still, the approach also provides flexibility since questions are allowed to be added while the interview takes place, which provides the authors with more information regarding the topic (Bryman and Bell, 2011). Structured interviews are often utilized for quantitative studies, where a semi-structured or unstructured approach often is used for qualitative studies (Bryman and Bell, 2011).

An unstructured approach was not used because a guide was needed when interviewing the companies. An unstructured approach means that the questions are improvised while the interview is occurring (Bryman and Bell, 2011). This would lead to disorganization and would

negatively impact the results because not all the themes identified in the literature would be covered.

3.3. Multiple Case Study

A case study can either be in a single or multiple form (Braxter and Jack, 2008). A benefit of case studies is that they can explain theoretical business issues in a practical context (Eriksson and Kovalainen, 2015). When conducting a case study, it is essential to know the benefits and disadvantages of the different types (Gustafsson, 2017). Multiple case studies are not as detailed as a one case study (Eriksson and Kovalainen, 2015). However, multiple case studies can be selected for several reasons. It helps the researcher test a wider perspective within the topic studied (Eisenhardt & Graebner, 2007). A multiple case study also helps to understand the differences and the similarities between different cases, which might lead to significant contributions within the literature. (Yin, 2003).

Since this study aims to compare the companies in the region and identify patterns in their decision-making, a multiple case study was chosen. Also, since the aim is to study companies from different countries, a single case study would not be suitable. It is recommended to perform a single case study when a person or a group is studied (Yin, 2003). For this study, multiple case studies have been utilized to get an in-depth and holistic view of the area studied.

3.4. Research Selection

The companies are selected from seven databases that BRG provided. The seven databases are for the years 2014 to 2020. All the companies are foreign-owned and are based in the Gothenburg region. The countries included are Norway, Finland, Denmark, United Kingdom, and France, as they are the countries that BRG aims to gain insight on. For the primary research, the interviews were mainly with companies from Nordic countries, except for one company from the UK. The secondary research includes French and British companies to make sure that they are included in the study.

The databases received from BRG included Swedish Standard Industrial Classification (SNI) which are five digits. They are used to organize different sectors. Since the databases consist of various industries, the SNI codes for the life science sector were searched to organize the data. The SNI codes were selected based on past studies, and the evaluation of the selection

was based on their activities. For instance, some of the SNI codes were identified from a report made by Øresundsinstittet for the life science industry (Sørensen et al., 2020). In the report, it has been argued that the SNI codes (21.200, 32.501, 46.460, and 72.190) were also used in industry reports about the life science industry by Vinnova and Growth Analysis. For the SNI code (46.691), we identified it ourselves because we noticed that BioMérieux, a biotechnology company, fell under that category.

The SNI codes are; *manufacture of pharmaceutical preparations (21.200)*, *manufacture of medical and dental instruments and supplies (32.501)*, *wholesale trade of pharmaceutical goods (46.460)*, *wholesale of measuring and precision instruments (46.691)*. *Other research and experimental development on natural sciences and engineering (72.190)*. After the SNI codes were established, a list of companies was formulated. They were then evaluated to determine if they were in the life science industry by studying the products or services that they offer. Companies that did not appear to be in the life science sector were eliminated.

We selected 33 companies from the databases received from the BRG through the SNI codes already mentioned. In addition to the databases, BRG sent an additional file, and six other companies were selected from there, making a total of 39 companies to contact. We started to contact the companies, but some companies were missing contact details such as their phone number or an email address. Regarding the companies that we were able to contact, we often began by calling the office, which then we were guided forward to the “most suitable” person as they often expressed. This often leads us to the CEO of the company or some kind of “top manager.” If we could not speak to the selected person, we then instead received an email address which we contacted. After calling the possible companies to contact, we received 11 interviews. For the secondary data, we decided on four companies because there was sufficient information online to analyze the reasons they were in Gothenburg.

In table 3 below, 15 companies that are included in this study are presented. Four companies do not have an SNI code because they were not in the databases. They were part of the additional file that was sent by BRG. The companies that have a check icon are part of the life science directory. The companies were compared to the Life Science Directory organized by BRG. The directory consists of information about the life science companies in the Gothenburg region. They were searched to obtain basic information about the companies.

Table 3: Companies included in the sample, with SNI codes and the life science directory.

Company	SNI Code	Life Science Directory
Touchpoint Medical Nordic AB	46.460	
Observe Medical AB	46.460	
Histolab Products AB	46.460	✓
Coremed Simonsen & Weel AB	46.460	✓
Guldmann Sverige AB	46.460	✓
Navamedic AB	46.460	✓
Cochlear Nordic AB	46.460	✓
Oticon Medical AB	72.190	✓
Albireo AB	72.190	✓
Takara Bio Europe AB	72.190	✓
BioMérieux Sweden AB	46.691	✓
NEOSS AB	Not found from the dataset	✓
Optergo AB	Not found from the dataset	
Coloplast AB	Not found from the dataset	
AB Previa	Not found from the dataset	

Sources: Seven databases received from BRG, 2021-02-16 and an additional file received from BRG through email 2021-02-24.

In appendix 2, there is a list of all the companies that we were not able to reach for the primary data due to different reasons.

3.5. Type of Data

3.5.1. Primary Data

Twenty-five questions were formulated beforehand, but the number of prepared questions did not hinder new questions to be asked during the interview. According to Patel and Davidson (2011), interviews are classified as primary data; this is when data is collected from the intended source. Data that is seen as primary has not been filtered or treated by any other person. Interviews allow broader and in-depth information which might lead to a better understanding of the topic studied (Bryman & Bell, 2017).

Table 4 below provides detailed information of the interviews. 11 interviews were held via multiple types of platforms. The type differed as it also depended on the participant's

preference. Due to COVID-19, Zoom was the most preferred option since it did not require a physical meeting. Regarding the Zoom calls, there were not any technical difficulties.

The interview sessions ranged from roughly 13-60 minutes per session. The participants were emailed the questions beforehand to be informed about the purpose of the interviews and the type of information that the study is seeking. It is essential to send the questions ahead so that the participating company can decide which member in their team is most relevant to answer the questions. Moreover, since it was a semi-structured interview, the questions were asked depending on the company's activities. For instance, companies that only established a sales office in Gothenburg were not asked about R&D-related questions.

During the interview, two roles were adopted. There was one interviewee, and one note-taker and these roles were not changed to keep the consistency. The note-taker took notes on the computer in case the recorded files were lost. Moreover, the interviewer did not take any notes to ensure that they are focused on the dialogue. During the Zoom calls, the note-taker was muted not to disturb the interview and be time-efficient by not asking additional questions. Before the interviews, we researched the companies to understand their activities in Gothenburg. Before the interviews started, a brief introduction about the purpose of the thesis was made to inform the participants of the reasons for the interviews. The language of the interviews depended on the comfort of the interviewee. Some participants were not comfortable with English, and therefore, the interviews were conducted in Swedish. The information was later translated to English to analyze the information effectively. Table 4 on the next page will present the companies that we interviewed. The table consists of their country origin, the time duration, language, the format and the date.

Table 4: Interview Information of the Selected Companies

Company	Country Origin	Duration	Language	Type	Date
Touchpoint Medical Nordic AB	Norway	38 minutes	English	Zoom (video call)	2021-03-15
Navamedic AB	Norway	25 minutes	English	Zoom (video call)	2021-03-15
Coremed Scandinavia AB	Denmark	X	Swedish	E-mail survey	2021-03-18
Guldmann Sverige AB	Denmark	56 minutes	English	Zoom (video call)	2021-03-19
Histolab Products AB	Finland	29 minutes	Swedish	Zoom (video call)	2021-03-22
Observe Medical AB	Norway	58 minutes	English	Face-to-face	2021-03-25
AB Previa	Denmark	27 minutes	Swedish	Telephone call	2021-04-01
Albireo AB	United Kingdom	33 minutes	English	Microsoft Teams (video call)	2021-04-13
Optergo AB	Finland	33 minutes	English	Zoom (video call)	2021-04-15
Oticon Medical AB	Denmark	24 minutes	English	Zoom (video call)	2021-04-16
Coloplast AB	Denmark	13 minutes	English	Zoom (video call)	2021-04-16

3.5.2. Secondary Data

The secondary data collected from four different companies were chosen due to the high amount of data accessed online. The knowledge found online was sufficient to analyze the companies with our findings. The other companies not selected for secondary data were not chosen due to the limited amount of secondary data found online.

Digital research can be a valuable method to collect information (Eriksson and Kovalainen, 2015). Information was found online about the foreign companies that have invested in Gothenburg, Sweden. The internet was useful to collect information as it was not possible to conduct interviews with all the companies in the sample. Since businesses are busy, it is challenging to access interviews (Eriksson and Kovalainen, 2008). Digital research has helped collect information about companies. Information is provided on the company's websites, annual reports, and press releases to learn more about their business activities in Sweden. Moreover, digital articles were utilized to learn about their collaborations with universities in the life science cluster. Sahlgrenska Science Park had information on their research

collaborations with companies. Government websites were also used to learn about the relations between Sweden and the countries in the study.

3.4.1. Data Analysis

Data analysis is one of the least processes in case studies (Yin, 2018). The data analysis for this study began with transcription of all the primary data, followed by combining primary and secondary data. The data was then categorized into the main motives; resource seeking, market seeking, efficiency seeking, and strategic asset-seeking, and then further classified into different themes found in the literature and the data collection. By dividing the data into different motives and themes, it facilitates the ability to make comparisons between the cases and develop our analysis.

The research approach for this study was, as already mentioned, abductive. Therefore, the theory collected before the interviewees was compared to the existing theories continuously throughout the analysis process. One can also argue that the analysis process begins when the interviews have started to occur since the researchers can compare their understanding of the theory together with the collected data. For this study, the comparison already started when note-taking and recording led to a beforehand plan when beginning with the data analysis.

3.6. Quality of the Study

The quality of the data collection is important to consider to increase the research's credibility and minimize any possibility of answering the research question(s) in a wrong manner (Saunders et al., 2009). This section will bring up the issues of reliability, validity, and generalizability.

3.6.1. Reliability

Reliability is concerned with the consistency of the findings and the analysis. However, it is important to be aware that the interviews and the results reflect reality at the specific time where the interviews were conducted (Saunders et al., 2009). Reliability also highlights if the study can be replicated, which becomes an issue for qualitative methods since, as already mentioned, the attitudes and the social situations are difficult to imitate (Bryman and Bell, 2011). Therefore, this might be seen as a limitation for the study where the researchers might not have

received the same attitudes if other employees within the companies were interviewed. Since the interviews were based on the respondents' own views and experiences on the topic.

One way to increase reliability is to minimize the participant error (Saunders et al., 2009), which is when the researcher makes mistakes. Still, according to Norris (1997), there is no paradigm solution to handle these errors. One way of minimizing errors is making sure that we are consistent with our roles, making us confident with our responsibilities. Also, we made sure to avoid expressing our own opinions, to reduce interviewer bias. We mainly asked the questions and allowed the respondent to explain themselves without interruption.

3.6.2. Validity

Validity explains how accurately a method measures the research object. If there is a lack of validity, it indicates that the study results are insignificant (Bryman and Bell, 2011). To be interviewed for this study, the companies must be foreign-owned, be located in the Gothenburg region, and be engaged in the life science industry. As already mentioned, we received data from the organization, BRG. This data consisted of foreign-owned companies within the Gothenburg region from different industries. The researchers then selected all according to the researchers' relevant life science companies, where 39 companies were selected. When we started to investigate the data, companies were removed since they had left the region, did not engage with any activities within the Gothenburg region, or for other reasons did not fulfill the criteria to be interviewed. Thus, we believe that this study can be valid because we included the relevant companies for this study.

Moreover, we argue that our study is valid since the respondents within each company have a high position within the company or have been in the company for many years, making them knowledgeable regarding our topic. We promised the respondents their anonymity. Therefore, the titles of the participants will not be combined with the companies. Out of the 11 respondents, seven interviews were held with the CEOs of the companies, while four interviewees were held with managers in high positions. Therefore, we argue that from their experience, they were qualified to provide insight on the Gothenburg region.

3.6.3. Generalizability

Generalizability highlights if the results of a study might become applicable for other settings and if, for instance, a case study were to be conducted on another business (Saunders et al., 2009). It could be argued that there are limitations within this study, such as generalizability since the study is based on 15 foreign-owned life science companies within the Gothenburg region. Since we received data of which life science companies were to be analyzed, other companies fulfilling the same criteria have therefore not been selected, which means that other companies might as well have fulfilled the requirements and would thus have led to a larger sample. Generalizability implies that the results can be applied to the whole population (Bryman & Bell, 2011).

However, the findings for this study might only be unique to the study's companies. Even if the authors early on could identify a pattern of benefits ranked out among the studies companies, it is still challenging to determine if the benefits would have been the same for other companies fulfilling the criteria within the region. However, qualitative research does not need to be generalizable; this is if the purpose of the study is to learn about a specific topic (Bryman & Bell, 2011). For this study, this was the aim of the selected companies' opinions and experiences.

3.7. Ethics

For ethical purposes, several approaches were taken to collect the empirical results. For the interviews, it was all voluntary participation. The participants were also allowed to withdraw at any moment and provide concerns if they wanted certain information to be removed from the study. Also, before the interviews were conducted, all the participants provided informed consent to record the meetings. In addition, the names of the participants in the companies have been kept anonymous to respect their privacy. It has been argued by Eriksson and Kovalainen (2015) that personal information should be kept confidential. Therefore, this information has not been included.

3.8. Overview of the Companies

We will now start by providing an overview of the companies selected for this study (see table 5, 6, 7, 8 and 9 below). There is a table for each of the five selected countries: Norway,

Denmark, Finland, France and the United Kingdom. The tables include information on the companies' names, activities, country of origin and their industry.

Table 5: Overview of the Norwegian companies and their activities

Company	R&D	Sales	Production	Industry	Focus area	Data
Navamedic AB		✓		Pharmaceuticals	OCT and prescription pharmaceuticals	Primary
Observe Medical AB		✓		Medical technology	Digital urine meter (Sippi)	Primary
Touchpoint Medical Nordics AB		✓		Medical technology	Medical equipment (ergonomics)	Primary

Source: Interviews, (see table 4), Navamedic, (2019a), Observe Medical, (2020) & Touchpoint Medical Nordics (2021).

Table 6: Overview of the Danish companies and their activities

Company	R&D	Sales	Production	Industry	Focus area	Data
AB Previa		✓		Healthcare services	Ergonomics	Primary
Coloplast AB		✓		Medical technology	Ostomy products, urologi and bandages	Primary
Coremed Simonsen & Weel AB		✓		Medical technology	Medical equipmentt	Primary
Guldmann Sverige AB		✓		Medical technology	Lifting equipment	Primary
Oticon Medical AB	✓			Medical technology	Hearing devices	Primary

Sources: Interviews, (see table 4), Previa, (2021), Coloplast, (2021b) & Coremed Simonsen & Weel, (2021), Guldmann, (2021) & Eartech, (2021).

Table 7: Overview of the Finnish companies and their activities

Company	R&D	Sales	Production	Industry	Focus area	Data
Histolab Products AB		✓		Biotechnology	Histology	Primary
Optergo AB	✓	✓	✓	Medical technology	Dental optics and ergonomics	Primary

Sources: Interviews, (see table 4), Histolab, (2018) & Multilens, (2021).

Table 8: Overview of the British companies and their activities

Company	R&D	Sales	Production	Industry	Focus area	Data
Albireo AB	✓			Pharmaceuticals	Liver disease medicine	Primary
Cochlear Nordic AB	✓	✓		Medical technology	Hearing devices	Secondary
NEOSS AB	✓		✓	Medical technology	Dental implants	Secondary

Sources: Interviews, (see table 4), Albireo, (2021), Cochlear Nordic, (2014) & Shalgreńska Science Park, (2020).

Table 9: Overview of the French companies and their activities

Company	R&D	Sales	Production	Industry	Focus area	Data
BioMérieux Sweden AB		✓		Biotechnology	Diagnostic solutions	Secondary
Takara Bio Europe AB	✓		✓	Biotechnology	Stem cells	Secondary

Sources: Interviews (see table 4), BioMérieux, (2019) & Takara Bio, (2021).

3.8.1. Norway

3.8.1.1. Navamedic AB

Navamedic is a Norwegian pharmaceutical company founded in 1999. Since then, their product portfolio has expanded, where they now include products such as medical devices, medical nutrition, cosmetics, and food supplements (LinkedIn, 2021 & Navamedic, 2019a). The

headquarters is located in Oslo, where they also are listed on the Oslo Stock Exchange, and their Swedish office is located in Gothenburg.

The company is present in the Nordic countries, Benelux, Baltics, UK, and Greece. Navamedic is a supplier of both prescription and OTC pharmaceuticals. It has been stated in their annual report that they do not engage in R&D activities (Navamedic, 2019a). They work with European suppliers and market the products that they are supplied. They acquire marketing authorizations that allow them to market the products. On their website, it has been explained that there is a drug shortage in the Nordics and that Navamedic collaborates with European manufacturers to supply products in the Nordic hospitals. Navamedic's strength is that they have the local expertise to market them (Navamedic, 2020).

3.8.1.2. Observe Medical AB

Navamedic acquired the medical technology company in 2015 (Navamedic, 2015), but then a demerger occurred. A demerger is when a company splits into smaller companies (Collins Dictionary, 2021). The demerger happened because Navamedic and Observe Medical had two separate focuses. Navamedic aimed to target pharmaceutical companies in Northern Europe, while Observe Medical is involved with medical technology globally (Observe Medical, 2019). Observe Medical was a medtech division and then was made into its own subsidiary (Navamedic, 2019b). The respondent explained that Navamedic put Observe Medical on the Oslo Stock Exchange in Norway. It was put on the Oslo Stock Exchange to maximize the company's value (Navamedic, 2019b).

The company currently has one product called Sippi. It is a digital urine meter that is currently sold in the market, and it has been in development since 2009 (Lindahl, 2015). Observe Medical sells to the Nordic countries, the Benelux (Belgium, Netherlands, and Luxembourg), U.K., Greece, and the Baltic countries. They currently do quality, development, regulatory and commercial operations in Gothenburg (Observe Medical, 2020).

3.8.1.3. Touchpoint Medical Nordic AB

Touchpoint Medical Nordic is a Norwegian medical technology company founded in 2005. The respondent explained that their first installation in Sweden was in 2006. The global headquarters is located in Florida, the United States, while the European headquarters is located in Belgium. The parent company sells its products and services to more than thousands of

healthcare facilities globally. Examples of their products are; medication delivery carts, wall mounting systems, workstations on wheels, medical equipment carts, and automated dispensing cabinets (Touchpoint Medical Nordics, 2021).

The Swedish subsidiary, Touchpoint Medical Nordic in the Gothenburg Region, is a sales office. They mainly engage in software that aims to promote safer handling of pharmaceuticals and implants within healthcare. The respondent mentioned that there are three employees at the Swedish subsidiary. The respondent also discussed that they started a Swedish subsidiary, and the owner that was leading was living in Västerås. The owner after that was from Sävedalen, thus, they decided to stay in the region. The company first entered the Swedish market through a distributor which was located in the Gothenburg region. Then the business increased, and the distributor changed to a direct sales office.

3.8.2. Finland

3.8.2.1. Histolabs Products AB

The respondent explained that the company was founded in Sweden in 1965. Their sales office is located in Sisjön, outside of central Gothenburg, and their head office is in Stockholm. The company engages in selling laboratory equipment within cell diagnostics (Histolab, 2018). In 2017, the company was acquired by Finnish Algol Group. The company consists of 50 employees, with 24 located in Gothenburg.

3.8.2.2. Optergo AB

Optergo is a Finnish-owned medical technology company with a focus on optics and ergonomics. The company was founded in 2005 (Multilens, 2018). From the beginning, the company was Swedish-owned but was later on acquired by Finnish owners. Then, Optergo was merged with the Swedish-owned company called Merident, which became MeridentOptergo. The Swedish and Finnish owners have 50/50 ownership in both of the companies. In 2021, the two companies chose to separate and are to become two companies again.

The main focus for this thesis has been on Optergo since that is a Finnish-owned company. In Gothenburg, the company has a sales office and an R&D center. They are aiming to move their production to the region.

3.8.3. Denmark

3.8.3.1. AB Previa

Previas is owned by the two Danish companies Falck Group and TryghedsGruppen, with their headquarters located in Stockholm. Previa is a healthcare company providing companies with corporate healthcare, statutory investigations, preventive visits and more. They are located in more than 90 places in Sweden and have more than 9,000 employees (Previas, 2021).

3.8.3.2. Coloplast AB

Coloplast is a medical technology company founded in 1951 in Denmark (Coloplast, 2021a). The company offers products within ostomy care, wound & skincare, continence care, and interventional urology (Coloplast, 2021b). The parent company engages in R&D, and the production takes place in Denmark, Hungary, France, China, and The US. The company first started to export into Sweden, which led to a subsidiary office in 1985 in Kungsbacka, where their main activities are sales and marketing. The company started with around seven employees in 1985, which has grown to 62 employees in 2021.

3.8.3.3. Coremed Simonsen & Weel AB

Simonsen & Weel has been in Gothenburg since 2008 and was acquired in 2018 by Coremed, leading to Coremed Simonsen & Weel, which led to a new product assortment to launch in Sweden. The activities in Gothenburg are sales, and their goals are to expand and grow their sales team. They sell medical technology products such as ECG, defibrillators, monitoring, blood pressure measurements, lung and diagnostics, products for operating rooms, and ultrasound as well as bunks (Coremed, 2021).

Their main customers are public and private healthcare. Therefore, they are often involved in public procurement (Guldmann Sverige, Interview, 21-03-19). The company has a distributorship with Schiller, Novak M., and Mindray. They cooperate with these suppliers and sell their products to the Swedish market (Coremed, 2021). They do not have an R&D center since they do not manufacture their products.

3.8.3.4. Guldmann Sverige AB

Guldmann Sverige AB is a Danish-owned company founded in 1997 (interview, 210319). Before the establishment, the mother company V. Guldmann A/S was founded in 1980

(Guldmann, 2021) and sold its products through a distributor in Sweden. The respondent explained that Guldmann Sverige first entered the Swedish market through a distributor located in the Gothenburg region, in Alingsås. Then the business increased, and the distributor changed to a direct sales office.

Furthermore, the headquarters is located in Alingsås, and they have a sales office in Stockholm. The parent company in Denmark engages in R&D, and the subsidiary in Alingsås is active in sales, service, and administrative tasks. The company offers products within care technology for people with disabilities and work tools for caregivers working with patients (Guldmann, 2021).

3.8.3.5. Oticon Medical AB

Oticon Medical is a subsidiary under the Demant Holding Group, a Danish company listed on the Copenhagen Stock Exchange. Oticon Medical is the second-largest manufacturer of hearing aids and has more than 3000 employees worldwide (Eartech, 2021).

Demant Holding Group entered Sweden by acquiring Otorix, a start-up, in 2006. In the 1980s, Patrik Westerkull developed BAHA, a bone-anchored hearing aid, along with Anders Tjellström at Sahlgrenska University Hospital and Bo Håkansson at Chalmers University of Technology. Oticon Medical further developed the bone-anchored system and, in 2009, introduced the Ponto Plus. The Ponto System is a direct competitor to BAHA, which is Cochlear's trademark (Näringsliv, 2013).

Oticon Medical has its head office in Askim and engages in R&D at the moment. They have three R&D centers in France, Sweden, and Denmark, and they do multi-site cooperation. They have more than 80 employees in Askim and are focused on developing hearing equipment (Näringsliv, 2013). They do not have any production facilities but work with suppliers globally to manufacture their products. At the moment, Cochlear and Oticon Medical are the two manufacturers that produce FDA-approved bone-anchored hearing products.

Moreover, they are a distributor for Cochlear implants. In 2006, Demant, the holding company of Oticon Medical, acquired the French firm Neurelec SA which develops Cochlear implants (Demant, 2013).

3.8.4. United Kingdom

3.8.4.1. Albireo AB

Albireo AB was founded in 2008 and spun out from AstraZeneca, a global Swedish-British biopharmaceutical company (AstraZeneca, 2021). The company's parent company Albireo Pharma, Inc., is located in Boston, Massachusetts, while the Swedish subsidiary Albireo AB is located in Gothenburg, Sweden. The company is a biopharmaceutical company that develops treatments for liver diseases (Albireo, 2021). They are at the clinical stage, which means that they only have an R&D center in Gothenburg, Sweden. They are part of the Biotech Center at Sahlgrenska Science Park (Sahlgrenska Science Park, 2016).

3.8.4.2. Cochlear Nordic AB

In the 1980s, Patrik Westerkull developed BAHA, a bone-anchored hearing aid, along with Anders Tjellström at Sahlgrenska University Hospital and Bo Håkansson at Chalmers University of Technology. In 2005, Cochlear entered Sweden by acquiring a company in Gothenburg called Entific for its research involving BAHA. Entific was launched in 1999 by Patrik Westerkull with Nobel Biocare. The acquisition was regarded as a strategy for Cochlear to increase its market share. It was viewed as a strategic fit as BAHA does not compete with Cochlear Implants since they deal with different areas of hearing loss (The Sydney Morning Read, 2005).

This company is considered British in the dataset because Cochlear Limited Europe is located in the United Kingdom. Moreover, in 2014, Cochlear Bone Anchored Solutions signed a renting agreement with Platzer Fastigheter AB, for seven years, with the contract ending in December 2021. Alongside their sales activities, they have their R&D and production in Gothenburg (Cochlear, 2014). The head office of BAHA is in Mölnlycke, which is outside of Gothenburg.

3.8.4.3. NEOSS AB

NEOSS AB was founded in 2000 in the United Kingdom. It is a British medical technology company that entered Gothenburg in 2006. They have established an R&D center and manufacture dental implants in Gothenburg (Sahlgrenska Science Park, 2020).

3.8.5. France

3.8.5.1. BioMérieux Sweden AB

In 2004, the French company opened a subsidiary in several Nordic countries which were merged into BioMérieux Nordic and focused only on sales. They have three joint research laboratories in France. Their production and R&D are located in France to have a smooth product development as they are connected with each other (BioMérieux, 2008).

3.8.5.2. Takara Bio Europe AB

In 2014, Celleris AB, a French biopharmaceutical company, sold their Swedish subsidiary to Takara Bio Europe AB, a Japanese company. Celleris sold their subsidiary because they were reorganizing their activities, aiming for a more narrow focus (Celleris, 2014). Takara Bio Europe currently has a biotechnology manufacturing clinic in Gothenburg. It is a specialized facility that manufactures human embryonic stem (hES) cell banks. In 2018, they were granted a manufacturing license by the Medical Products Agency, the Swedish national authority for their stem cell line (Takara, 2021).

4. Empirical Result

In this chapter, we will present the findings collected from our study. The advantages and disadvantages are organized under each motive. Lastly, the country origin is included, to provide information on the five selected countries. This is to analyze the relation between Sweden and the selected countries regarding FDI.

4.1. Location FDI Motives and Challenges

This section will be based on Dunning's four motives framework. The results will be organized between the four motives. The advantages and challenges will both be identified under each category.

4.1.1. Resource seeking

This section will present results from companies that expressed that they entered for financial purposes. Also, companies that mentioned infrastructure will be included.

4.1.1.1 Investment Incentives

None of the companies interviewed communicated that they entered to lower their costs by seeking low-cost resources. Regarding financial support, Albireo's respondent expressed that it is difficult to connect with investors. As discussed before, Albireo is a spin-out from AstraZeneca. The respondent suggested that BRG can provide more guidance, especially for early-stage companies:

“The region can do more in terms of helping out, getting companies to the next stage where they get more money from investors.” (Albireo, Interview, 21-04-13)

Albireo's respondent discussed that the region has few investors compared to other locations such as the United States, Copenhagen, and Malmö, which makes it difficult for small sized companies to develop.

4.1.1.2. Infrastructure

The infrastructure has been highlighted as a benefit by Touchpoint Medical Nordic and Histolab Products's respondents. The region has been viewed as beneficial for transportation. Touchpoint Medical Nordic's respondent stated:

“We have good communication with air freight from Landvetter. We have the trains, it's good, and we are close to all markets, to Denmark, to Norway and also Finland. It's basically the heart of Scandinavia, so it is a good location.” (Touchpoint Medical, Interview, 21-03-15)

Histolab Products's respondent discussed the logistics in the region. The respondent stated in Swedish, which then has been translated to English:

“Where we sit now, then we sit in Sisjön, there we have the E6 just outside, we have a pretty good logistics when it comes to Schenker and DHL and things that are important from us then.” (Histolab Products, Interview, 21-03-22)

The Gothenburg-Landvetter Airport has been viewed as a benefit by Optergo and Navamedic's respondents, as it makes it easier to travel.

4.1.1.3 Challenges

Respondents from Histolab Products, Previa, and Coloplast have communicated that Gothenburg's logistics have been causing disruptions. While Histolab Products's respondent has highlighted it as an advantage, the respondent expressed that it is also a shortcoming. There is construction work that has affected their deliveries. Coloplast's respondent has also discussed that the situation at the moment has made transportation more difficult. Previa's respondent also discussed the recent road construction and that it has affected their connections to their customers.

Furthermore, Oticon Medical and Coloplast's respondents discussed the airport, explaining that air travel could be challenging. Oticon Medical's respondent argued that it is easier to travel to Copenhagen than to Gothenburg. Coloplast's respondent stated:

“I think that the airport is quite small and regionally based, which again complicates it if you want to have someone that's internationally very mobile, and I think that those two are really the key challenges.” (Coloplast, Interview, 21-04-16)

4.1.2. Market seeking

This motive is about companies' strategy to enter a new market and increase their sales. The majority of the companies except for Albireo, NEOSS and Takara BIO Europe established a sales office in Gothenburg. Sweden was viewed as an effective market to increase their sales for some of the companies. For instance, Observe Medical's respondent expressed that the future goals for the company are to expand their sales in the region. As discussed above, it is a Norwegian company that produces its digital urine meter called Sippi.

Moreover, Navamedic, a Norwegian pharmaceutical company, entered by acquiring a pharmaceutical company in 2007 called Vitaflo Scandinavia. It was viewed by the CEO, Øyvind Brekke, as an opportunity to increase their product portfolio and increase their presence in Europe (Lysaker, 2007). Navamedic's respondent has also expressed that it is a valuable location to reach their customers in the Scandinavian market:

“It is quite central in Scandinavia. So, a company that has the Scandinavian market as the home base, Gothenburg makes a scene to be in.” (Navamedic, Interview, 21-03-15)

This was also a similar case for Oticon Medical, which produces hearing implants. The respondent explained that Oticon Medical, which is under Demant Group, acquired Otorix, a Swedish start-up, to gain a new product segment which was implantable hearing aids.

Furthermore, it was communicated by several companies that they entered to be near their customers. For instance, Histolab Products's respondent explained that they aim to have a local presence near their customers. Also, Touchpoint Medical Nordic's respondent explained that Västra Götaland Region (VGR) is their biggest client and that they need to be close to their customer, which explains their current establishment in the region. They also explained that a local presence means that they can adapt to their customers:

“We are present locally, and that means we are close to our software development, and that means we are more adaptable to our customers.” (Touchpoint Medical Nordic, Interview, 21-03-15)

Guldmann Sverige’s respondent also expressed that one of the reasons was to have proximity to their customers at the time. Since VGR was a significant customer when the company first started, they aimed to be near them. The significance of geographical proximity, in general, was highlighted several times throughout the interview:

“We have a sales office because still, for us, presence in geography means that we sell more.” (Guldmann Sverige, Interview, 21-03-19)

“I think it is always good to be next to where the major customers are, and that would mean that you would end up in Gothenburg and Stockholm.” (Guldmann Sverige, Interview, 21-03-19)

Furthermore, BioMérieux, a French company, discussed in their annual report that customer proximity is considered highly valuable (BioMérieux, 2019). Their services are focused on enhancing customer service, and that is facilitated by locating near them. Lastly, Previa’s respondent discussed that Gothenburg was selected because of the variety of customers available. The respondent described the city as a location consisting of many headquarters and industries. Since they work with occupational health, there are lots of companies that can become customers. They also expressed that their sales office must be near the customers in the market.

4.1.2.1. Challenges

Coremed Simonsen & Weel and Previa’s respondents expressed their opinions on Gothenburg’s market. Coremed Simonsen & Weel’s respondent has explained that since most of their customers are in Stockholm, it would be advantageous to have an office there to be close to them. Previa’s respondent has commented that the shortcomings of the region are that price is the main priority for customers. The respondent stated in Swedish, which then has been translated to English:

“The price sensitivity is very noticeable. I compare a lot with Stockholm.”

(Previa, Interview, 21-04-01)

4.1.3. Efficiency seeking

This motive is about companies aiming to improve the overall efficiency of their supply chain. From the results, some companies sought to be cost-effective. Some companies’ respondents also discussed that they decided on another location besides Gothenburg, Sweden, because they were restructuring the supply chain to be more efficient. A location can also be selected if the company views it as an entrepreneurial environment that is striving to be efficient. Table 10 below highlights the companies that have discussed their efficiency strategies.

Table 10: *Efficiency seeking companies*

Company	Country	Activities	Industry
Guldmann Sverige AB	Denmark	Lifting equipment	Medical Technology
Observe Medical AB	Norway	Digital urine meter (Sippi)	Medical technology
Optergo AB	Finland	Dental optics and ergonomics	Medical technology
Oticon Medical AB	Denmark	Hearing devices	Medical technology
Touchpoint Medical Nordic AB	Norway	Medical equipment (ergonomics)	Medical technology

Sources: Interviews (for date, see table 4) combined with databases received from BRG, 2021-02-16 and an additional file received from BRG through email 2021-02-24.

4.1.3.1. Cost-Efficiency

Several companies selected Gothenburg instead of Stockholm because they viewed Gothenburg as cost-effective. For instance, Histolab Products’s respondent explained that Gothenburg is more affordable compared to other cities. The respondent stated in Swedish, which then has been translated to English:

“We have a budget, and we have above all cost-effectiveness in certain areas then, certain types of costs, but when it comes to salaries, then we have to follow it. And it is more expensive in Stockholm, not to mention Norway and Copenhagen.”

(Histolab Products, Interview, 21-03-22)

This was also a motive for Guldmann as the respondent described the city as more cost-effective than Stockholm. The current sales office in Stockholm has a high rent and higher salaries, which is more expensive than Gothenburg. It is one of the reasons that the company has stayed in the region.

However, Gothenburg was not selected by several companies because other locations were viewed as more efficient. Observe Medical selected a supplier in Borås and the Czech Republic. Observe Medical's respondent stated:

“In Czech Republic, we get the best price. We also get the best quality.”

(Observe Medical, Interview, 21-03-25)

Furthermore, Observe Medical's respondent explained that it is costly to have their own specific production line. They do not manufacture their products in-house because of the high costs. Thus, they work with suppliers for their product called Sippi. When the company expands, then it can consider having its own supply chain.

4.1.3.2. Supply Chain Restructuring

Some companies explained that Gothenburg was not selected due to the reorganization of their supply chain. Some respondents explained that the R&D needed to be near their manufacturing facilities. For instance, Touchpoint Medical Nordic's respondent explained that their headquarters are outside of Florida and combines R&D, sales and production facilities.

Guldmann Sverige's respondent also provided a similar response. The respondent explained that their production needs to be in Denmark because their R&D center is located there. They need to be close to each other because there is a lot of cooperation between them. Also, Guldmann Sverige's respondent did not view Sweden as a drastic change from Denmark. Therefore, it was not a particularly attractive place for production. Alongside their production facilities in Denmark, they also produce in Ukraine to lower their costs.

However, for Optergo, they have moved their production facilities to Sweden to be less vulnerable. The respondent explained that the current situation is that they are moving all of their production from Finland to Sweden. The respondent explained that at the moment, it is vulnerable because there are only two or three people in both Finland and Sweden that are

producing. If someone becomes sick or something else that affects the production workforce, there can be delays.

4.1.3.3. Efficient Clusters

Lastly, it was communicated by two medical technology companies, Observe Medical and Oticon Medical, that Gothenburg has an effective medical technology industry. Oticon Medical's respondent has expressed that there are many medical technology companies in the region. Observe Medical's respondent stated:

“You get stimulated from other companies, but also there is, if there is a consultancy, then it is very good because then these consultants are up to speed. It's a dense environment, and that's good.” (Observe Medical, Interview, 21-03-25)

“It is a very rich region in terms of consultants, technology, RISE institute.”
(Observe Medical, Interview, 21-03-25)

4.1.3.4. Challenges

Some companies expressed that the networking environment in Gothenburg was not ideal. Observe Medical's respondent did not view Gothenburg as highly competitive compared to Stockholm. Furthermore, the respondent made some suggestions to improve the networking environment. The respondent explained that they would prefer to have the contact details of other companies and suppliers rather than attending events to connect to others in the industry:

“Create a contact; it might be like an index where you can find which companies, which consultants.” (Observe Medical, Interview, 21-03-25)

“I think it's important to have a company to company network, but I think it would also be good to have company to supplier because as we are many in Gothenburg in the early phases, our companies are just a few people plus a lot of suppliers.”
(Observe Medical, Interview, 21-03-25)

Furthermore, Albireo's respondent suggested that BRG can cooperate more with companies in the region. The respondent acknowledged that BRG is already working productively in the region. However, it was recommended by the respondent that they can provide more support,

such as with legal matters, and help companies develop a network. Albireo's respondent also demonstrated concern that the biotechnology community is spread out in the region and is not near each other. It was expressed that since they recruit people that work in the biotechnology industry, they desire that the community develops in the region.

Moreover, among the respondents, there were many companies mentioning the awareness of BRG as of Västsvenska handelskammaren. Västsvenska handelskammaren is a private organization that facilitates support in networks, legal advice, education, and other services that aim to strengthen the business environment in the west of Sweden (Västsvenska handelskammaren, 2021).

4.1.4. Strategic asset-seeking

This motive is about companies seeking knowledge assets to enhance the company's long-term strategy. This section has been organized into three sections; type of research investment, knowledge-sharing in collaborations, and highly skilled labor market.

4.1.4.1. Type of Research Investment

Table 11 on the next page presents the companies that are to be considered strategic asset-seekers. It includes their type of research investment which are R&D centers, acquisitions, sales office and a representative office. Companies have engaged in R&D activities through different strategies.

Table 11: Strategic asset-seeking companies

Company	Country	Activities	Industry	Type
Albireo AB	United Kingdom	Liver disease medicine	Pharmaceuticals	R&D
Cochlear Nordic AB	United Kingdom	Hearing devices	Medical technology	R&D and acquisition
Guldmann Sverige AB	Denmark	Lifting equipment	Medical technology	Sales office
NEOSS AB	United Kingdom	Dental implants	Medical technology	R&D
Observe Medical AB	Norway	Digital urine meter (Sippi)	Medical technology	Representative office
Optergo AB	Finland	Dental optics and ergonomics	Medical technology	R&D
Oticon Medical AB	Denmark	Hearing devices	Medical technology	R&D and acquisition
Takara Bio Europe AB	France	Stem cells	Biotechnology	R&D

Sources: Interviews (for date, see table 4) combined with databases received from BRG, 2021-02-16, an additional file received from BRG through email 2021-02-24, Takara, (2021), The Sydney Morning Read, (2005), BioMérieux, (2008) & Sahlgrenska Science Park, (2020).

4.1.4.2. Knowledge-Sharing in Collaborations

Several companies communicated that they entered Gothenburg for the research capabilities. Takara Bio explained in their interview with Sahlgrenska Science Park that they entered Sweden to access the research in in vitro fertilisation (IVF) (Pettersson, 2018). It is a Japanese parent company that acquired the French subsidiary called Collectis. Takara Bio Europe is a wholly-owned subsidiary that holds the Collectis brand (Bionity, 2021). From the interview with Catharina Brandsten that we translated from Swedish to English, she explained the benefits of Gothenburg for their activities. She discussed that the new members recruited come from academia. She explained the importance of locating in an urban location with highly educated people to recruit them (Pettersson, 2018).

Furthermore, NEOSS is a British company that entered for the research available in the region. BBC News interviewed them and studied their presence in Gothenburg. They found that NEOSS is in the region because of the success of osseointegration in Gothenburg. Moreover, NEOSS is present at Sahlgrenska Science Park's Biocenter. They discuss that modern dental

implantology first started in Gothenburg by Professor Per-Ingvar Brånemark. NEOSS has collaborated with the University of Gothenburg to work on recovering lost dentine (Åkervall, 2017).

Optergo is another company that entered the region because of the existing knowledge present. The respondent highlighted how narrow their field is. Therefore, the main reason for Optergo to enter the Gothenburg Region was due to the knowledge existing in the region available at the time. Furthermore, Optergo has made collaborations in the region with universities. The respondent explains that they have had other big research projects within the Gothenburg region.

Oticon Medical is another company that entered for the research in Gothenburg. The respondent explained that their R&D is focused on implants in Gothenburg. The respondent explained that Demant Group decided to stay in Gothenburg rather than move Oticon Medical to Denmark due to the core competencies available. Oticon Medical has several collaborations with universities in Gothenburg. For instance, there is an Industrial PhD project the University of Gothenburg organizes that is focused on bone conducting hearing implants (University of Gothenburg, 2021). Oticon Medical collaborated with a PhD professor, Bo Håkansson, from Chalmers University of Technology, as he was one of the collaborators for the Baha product. The partnership aims to gain knowledge from his research (Tumblin, 2014). The respondent has mentioned that they have also collaborated with Sahlgrenska Academy at the biomaterials center.

Cochlear Nordic is another company that has come to Gothenburg for research. Similar to Oticon Medical, it is focused on hearing aid systems. In the press release, Anthony Manna, the CEO, explained that Gothenburg has all that the company needs. It is viewed as a suitable location due to the relevant collaborations possible to gain knowledge about implants, sound vibration, and clinical studies. He explained that Cochlear has their research facilities around the world and that their goal is to access talent.

There are other companies that have made collaborations with universities. For instance, Coloplast's respondent has expressed that they are collaborating with universities. Also, Observe Medical has tested their product, Sippi, at the Västra Götaland Region's hospitals. They viewed this collaboration as an opportunity to increase their market potential as they have

access to the region (Navamedic, 2018). Observe Medical's respondent explained that at the moment, they are currently working with Chalmers University of Technology:

“One is on the clinical side, with Sahlgrenska and Chalmers, we are not that much in Stockholm, but it goes in phases because right now we have a project where we really need a lot of collaborators, and then we look at Chalmers specifically.”

(Observe Medical, Interview, 21-03-25)

Albireo has also made collaborations in the region. The respondent considered Sahlgrenska Science Park as an effective organization for R&D. They viewed the region as a beneficial location for research purposes:

“We have traditions here with very good research capabilities, people that are knowledgeable in various areas. So, I think Gothenburg, in that sense, is a good place for research.”

(Albireo, Interview, 21-04-13)

Albireo's respondent further discussed that the high labor market has attracted the company to enter the region. Since AstraZeneca is located in the same location, it is beneficial for Albireo:

“Gothenburg, in particular, having the AstraZeneca hub here has helped us a lot.”

(Albireo, Interview, 21-04-13)

Employees from AstraZeneca have been consultants guiding Albireo AB's drug development. It was expressed in the interview that the company is growing in Gothenburg with their research and the number of employees in the team. The company is currently working on becoming commercial in the future.

4.1.4.3. Highly Skilled Labor Market

Furthermore, Navamedic, Coloplast and Guldmann Sverige's respondents highlighted that there is a high labor market for sales. For instance, Navamedic's respondent has stated that:

“We also have a lot of our wholesalers here. We feel it's important to have a nearby location for them, and we still feel that Gothenburg is a good place to recruit people from since we have a tradition of pharmaceuticals and medtech here.” (Navamedic, Interview, 21-03-15)

Guldmann Sverige's respondent compared Gothenburg to Stockholm. The respondent explained that it is more advantageous to be in Gothenburg due to the labor market. In Stockholm, people tend to move from a company after a few years, while in Gothenburg, it is less common. Since the knowledge is held with the staff, it is not preferred that the core staff changes every couple of years as then they lose the knowledge when the employees leave the company. Moreover, other benefits of the Gothenburg region were highlighted. Since Gothenburg is a big city, the recruitment process is efficient. The respondent explained that there are highly educated people in Gothenburg.

However, Touchpoint Medical Nordic, Coremed Simonsen & Weel, and Previa communicated that the region was not selected for human resource management. For instance, Touchpoint Medical Nordic's respondent discussed that the skills that the company was seeking were independent of the location. Since the skills were specialized, it was difficult to find the skills in Europe in general. For Coremed Simonsen & Weel, it was expressed by the respondent that it was not relevant for the company as their sales employees are spread out across Sweden. Previa's respondent explained that the company engages in R&D activities in Stockholm since the type of research they seek is not available in Gothenburg.

4.1.4.4. Challenges

Oticon Medical's respondent has discussed that it can be competitive to recruit competent people in the region because of its competition. Since many medical technology companies are looking for the same employees, it can be challenging to hire the most skilled for the company.

Furthermore, Observe Medical's respondent explained that it could be challenging to recruit foreign employees for an established global medical technology company due to the low salaries compared to the high costs of living. Coloplast's respondent also expressed that it can be challenging to recruit foreign employment. Coloplast's respondent discussed that Gothenburg is not as international as other locations. Furthermore, Histolab Products's respondent discussed their challenge when it comes to recruitment. The respondent explained

that it could be a challenge to find qualified people with specific skills. The respondent stated in Swedish which then has been translated to English:

“And it is not always so easy to find in Gothenburg; we find it easier in Stockholm.”

(Histolab Products, Interview, 21-03-22)

4.2. Country Origin

The country of origin has a section because the aim is to understand how it can impact FDI. The countries' markets were researched to have a background overview of their life science industries. It can provide insight into the managerial implications on how the Gothenburg region can increase FDI from the five selected countries.

4.2.1. Nordic Countries

There has been cross-collaboration between the Nordic countries. For example, Sweden, Finland, and Norway have recently collaborated. Five life science Nordic organizations have collaborated. The general manager for one of the organizations explained that the Nordic countries are small independently. With this collaboration, it can strengthen their life science capabilities (Oslocancer, 2020). Moreover, there has also been a conference for Nordic national associations in the pharmaceutical industry called Nordic Life Science Conference. The conference aims to discuss how the Nordic countries can collaborate to increase global competitiveness (Lif, 2021). In a study by Sahlgrenska Science Park (2018), it is argued that there is potential for collaboration in the Nordic region. With cooperation, it is discussed that there can be knowledge shared for innovation.

4.2.2. United Kingdom

The government's goal is to improve their life science sector. They are working on encouraging multinationals such as AstraZeneca to be placed in the UK. It appears that Brexit has not affected the investments of R&D in the UK, as AstraZeneca has recently established an R&D center in Cambridge (The Economist, 2020).

There have been changes that have occurred. The European Medical Agency has moved from the UK to the Netherlands (Cohrt, 2019). Furthermore, there will be a change in the legal framework for UK-based manufacturers selling to the EU. For instance, the CE mark is a legal

requirement for medical devices. It allows them to sell in the EU market. However, it will no longer be valid after 30 June 2023 if it is approved by a UK notified body. UK-based manufacturers will need an authorized representative in an EU member state to be approved (Gantzhorn and Bjerrum, 2021). Thus, it might be that companies establish a sales office in the EU to gain approval to sell to the EU market (Dennis, 2020). Furthermore, there might be a decrease in EU nationals moving to the UK for employment. Thus, there could be a decrease in recruitment for highly skilled people (Cohrt, 2019).

4.2.3. France

The Swedish government is working with the French government on a strategic partnership to increase collaboration between both countries. Digitalization is an area that both countries are exploring in health care. It is suggested that exchange in experiences regarding digitalization transformation will be beneficial. Both countries are also involved in fighting antimicrobial resistance (AMR) when medicine no longer functions for infections. Lastly, both countries have expressed interest in endocrine disruptors (Government of Sweden, 2017), which disrupt hormonal systems.

In 2019, they updated their partnership to continue. Part of the partnership is encouraging French and Swedish small and medium-sized companies to develop joint R&D projects in the life science industry. This will be facilitated by Vinnova, the Swedish Innovation Agency, and French Bpifrance. The goal is to develop innovations (Government of Sweden, 2019). One of the French National Assembly members highlighted that artificial intelligence is strong in France and also in the Nordic countries. Therefore, he believes that cooperation will occur in the future (Krummenacker, 2019). Thus, it may be that there is an increase in research collaborations between France and Sweden.

4.3. Summary

4.3.1. Advantages and Challenges

Table 12: Summary of our findings

Resource seeking	None of the companies entered for financial reasons. Albireo's respondent explained that there was a lack of investors suggested that BRG should connect companies more to them. Moreover, infrastructure was highlighted as a benefit by several respondents. However, the current construction projects have negatively impacted three companies. There were mixed results regarding the airport, as some viewed it as a benefit while others did not.
Market seeking	Many of the companies entered to increase in sales and opened a sales office to close to their customers. Some companies entered by acquiring a Swedish company for access to a new product segment. Majority of the companies in the sample are considered market seekers except for Albireo and Takara Bio Europe. Regarding the challenges, AB Previa's respondent discussed that price sensitivity was an issue in Gothenburg.
Efficiency seeking	Some companies did not enter Gothenburg because they wanted their production to be near their R&D center which is in another location. Some companies discussed that the medical technology clusters are efficient. A few respondents expressed that they needed support from BRG to network to other companies.
Strategic asset-seeking	Several companies expressed that they entered the region for knowledge access. Eight companies appear to be strategic asset-seekers. Gothenburg is considered by several respondents as a valuable location for collaborations with universities. It has also been highlighted as a location with a highly skilled labor market. However, there is competition between companies for the same types of employees. Also, it can be difficult to recruit international people to the region.

Sources: Interviews (for date, see table 4) combined with databases received from BRG, 2021-02-16, an additional file received from BRG through email 2021-02-24, Takara, (2021), The Sydney Morning Read, (2005), BioMérieux, (2008) & Sahlgrenska Science Park, (2020).

4.3.2. Country Origin

The Nordic life science industry has the potential for all the Nordic countries to collaborate with each other. There has been discussion that if the Nordic region cooperated, they could strengthen their competence in life science. France has common interests with Sweden and is planning to cooperate regarding AI and health care. Regarding the UK, since Brexit has occurred, there have been changes that may indicate that it can potentially impact UK's FDI into other countries.

5. Analysis

We will now present our analysis where the empirical findings will be connected to the literature review. The information has been split into two sections; motives and country of origin. Four motives have been identified in this study. The advantages and challenges have been organized under each motive. Country origin has its own section as it will include discussion about FDI from the selected countries.

5.1. Location FDI Motives and Challenges

Table 13 on the next page consists of all the companies collected from both primary and secondary research. 11 companies were interviewed, and four have been included in secondary research, making a total of 15 companies in the sample. They have been organized according to the motives for entering the region. Resource seeking, market seeking, efficiency seeking, and strategic asset-seeking are four motives that Dunning highlights as motives for FDI. Resource seeking is about companies entering the region to lower their natural resources costs or find financial support. Market seeking is about companies seeking new markets to join. Efficiency seeking is about companies aiming to improve the overall efficiency of the supply chain by lowering the costs or spreading the risks. Strategic asset-seeking is about companies looking for knowledge or technological capabilities. Based on table 13, it appears that market seeking is the most common motive for companies, followed by strategic asset-seeking as the second most common motive.

Table 13: Companies' strategies

Companies	Resource seeking	Market seeking	Efficiency seeking	Strategic asset-seeking
Primary Research				
Albireo AB				✓
Coloplast AB		✓		
Coremed Simonsen & Weel AB		✓		
Guldmann Sverige AB		✓	✓	✓
Histolab Products AB	✓	✓	✓	
Navamedic AB	✓	✓		
Observe Medical AB		✓	✓	✓
Optergo AB	✓	✓	✓	✓
Oticon Medical AB		✓	✓	✓
AB Previa		✓		
Touchpoint Medical Nordic AB	✓	✓		
Secondary Research				
BioMérieux Sweden AB		✓		
Cochlear Nordic AB		✓		✓
NEOSS AB				✓
Takara Bio Europe AB				✓

Sources: Interviews (for date, see table 4) combined with databases received from BRG, 2021-02-16, an additional file received from BRG through email 2021-02-24, Takara, (2021), The Sydney Morning Read, (2005), BioMérieux, (2008) & Sahlgrenska Science Park, (2020).

Table 14 below includes the strategies of the companies. We have broken down the motives into simpler terms to provide a clearer overview of the findings.

Table 14: Motives simplified

Company	Findings
Albireo AB	Research.
Coloplast AB	Sales.
Coremed Simonsen & Weel AB	Sales.
Guldmann Sverige AB	Sales, cost-efficiency and high skilled labor
Histolab Products AB	Sales, cost-efficiency, and infrastructure.
Navamedic AB	Sales and infrastructure.
Observe Medical AB	Sales, cost-efficiency, and research.
Optergo AB	Sales, infrastructure, research and production.
Oticon Medical AB	Sales, supply chain restructuring, and research.
AB Previa	Sales.
Touchpoint Medical Nordic AB	Sales, infrastructure, supply chain restructuring and research.
BioMérieux Sweden AB	Sales.
Cochlear Nordic AB	Sales, research, and production.
NEOSS AB	Research and production.
Takara Bio Europe AB	Research and production.

Sources: Interviews (for date, see table 4) combined with databases received from BRG, 2021-02-16, an additional file received from BRG through email 2021-02-24, Takara, (2021), The Sydney Morning Read, (2005), BioMérieux, (2008) & Sahlgrenska Science Park, (2020).

The table above consists of all the companies collected from both primary and secondary research. 11 companies were interviewed, and four have been included in secondary research, making a total of 15 companies in the sample. They have been organized according to the motives for entering the region: resource seeking, market seeking, efficiency seeking, and strategic asset-seeking from Dunning's theoretical framework. Resource seeking is about companies entering the region to lower their natural resources costs or find financial support. Market seeking is about companies seeking new markets to join. Efficiency seeking is about companies aiming to improve the overall efficiency of the supply chain by lowering the costs or spreading the risks. Strategic asset-seeking is about companies looking for knowledge or technological capabilities. Based on the table, it appears that market seeking is the most

common motive for companies, followed by strategic asset-seeking as the second most common motive.

5.1.1. Resource seeking

5.1.1.1. Investment Incentives

None of the companies entered the region for cheaper natural resources. Also, funding was not sought by the majority of the companies interviewed. Contrary to the funding possibilities mentioned by KPMG (2018), it does not seem that the companies interviewed have used them. It appeared that only Oticon Medical, a Danish hearing aid medical technology company, attempted to look for financial support when they first started. However, since they increased in size because Demant Group acquired them, it was no longer necessary.

It was suggested by Albireo's respondent that organizations such as BRG should assist in connecting start-ups to investors. Albireo is a spin-out from AstraZeneca, and when they first started in 2008, a large concern was finding financial resources. The respondent explained that other locations, such as the United States, were more attractive in that aspect. These results demonstrate that Sweden is not the primary location to lower costs in natural resources and gain financial funding. It appears that the Gothenburg region is not selected for financial support by foreign companies.

This challenge has been highlighted by Styhre (2015), who argued that there are not a lot of investors in Sweden to connect within the life science industry. This could be a possible explanation for the companies' struggle to find financing in the region. However, in the study by Sahlgrenska Science Park (2018), it has been discussed that although it has been challenging to find investors in the region, the situation is improving. The Gothenburg region is attracting more investors because of the development of digitalization in health care. Thus, it could be that this is no longer an issue for foreign-owned companies in the future, and they can connect with the investors needed to develop their projects.

5.1.1.2. Infrastructure

Dunning (2009) has discussed that resource seekers may seek a location with a beneficial infrastructure. This appeared to be the case for four companies; Touchpoint Medical Nordic, Histolab Products, Navamedic, and Optergo. For example, Touchpoint Medical Nordic's

respondent highlighted logistics in the Gothenburg region as a benefit. The respondent expressed that good communications with air freight from the Gothenburg-Landvetter airport combined with the trains from the central of Gothenburg to their location in Jonsered. The respondent also stated that the railways through the Gothenburg region bring good connections with Denmark, Norway, and Finland.

Moreover, Histolab Products is situated in Sisjön, outside of Gothenburg centrum, where they have the highway E6 just outside of their office. The respondent has mentioned that the logistics are effective when they use Shenker and DHL. This demonstrates that some companies are satisfied with the infrastructure of the region. The companies' transportation of products is not hindered and can be delivered effectively. However, Histolab Products's respondent has discussed that the current construction project has recently made a negative impact. It appears, though, that in general, the Gothenburg-Landvetter Airport and the seaport in Gothenburg have been viewed as advantages in transporting goods for companies. This has also been identified by Braunerhjelm and Helgesson (2007). The scholars communicated that an international airport might be necessary for companies since the employees might need frequent traveling. Thus, it appears that for some companies, the presence of the Gothenburg-Landvetter Airport has assisted companies with their operations.

However, there was a finding by SwedenBIO (2021) that has discussed that Gothenburg's infrastructure has motivated companies to produce in Sweden. This does not seem to be the case in this study. The majority of the companies in the sample did not establish a production facility in the Gothenburg region and have aimed to produce in other countries.

In general, though, the findings support the rankings in the KPMG report (2018), which ranks Sweden as 14th among European countries for the *Quality of overall infrastructure*. This ranking covers factors such as; quality of roads, railroad infrastructure, and airport infrastructure. This can also be supported by Swedavia (2021) that has argued that Gothenburg has a well-structured infrastructure.

5.1.1.3. Challenges

However, a few respondents criticized Gothenburg's infrastructure. Previa and Histolab Products's respondents communicated that the current construction projects as a hindrance to their operations. The Västlänken (tunnel) currently in construction in the center of Gothenburg

has had a negative impact. Previa's respondent explained that it negatively impacts their access to customers. The respondent highlighted that clearer signs would make it easier for their customers to find them and be on time. Regarding Histolab Products, although the respondent has highlighted the infrastructure as a benefit, they also discussed that the current construction work negatively affected their job security. Due to the Västlänken, they can no longer offer their customers the same delivery security as before, which has enormously affected their business.

As already mentioned, some respondents brought up the airport as an essential factor for their locations. However, Coloplast and Albireo's respondents criticized that the airport has fewer direct connections than other airports. Braunerhjelm and Helgesson's (2007) article explained that the Danish part of the Medicon Valley had an advantage over the Swedish part since they had the large international airport, Kastrup. According to Coloplast AB's respondent, the Gothenburg-Landvetter airport was relatively small and regionally based if the company wanted to have internationally mobile employees. Albireo AB's respondent explained that since there are no direct flights to the US where they have many of their investors, it affects them negatively when the investors flying in from the US have to travel through Copenhagen or Stockholm. Therefore, the respondent stated that direct flight from Gothenburg to cities such as New York, Boston, and other places in Europe would positively affect the Gothenburg region.

However, we argue that this motive would not influence companies to leave the Gothenburg region. As discussed before, there are advantages to the region that can outweigh this aspect. Also, Gothenburg has an international airport while other cities in Sweden do not, which means that it still has an advantage over other locations in the country.

5.1.1.4. Overall Remarks

It appears that none of the companies in the study have entered for financial reasons. In conclusion, it seems that the resource seeking motive is not common for companies to be in the Gothenburg region. Albireo's respondent explained that BRG could cooperate with companies and connect them to investors more. This indicates that Gothenburg is not generally selected by companies to lower their costs or for financial support. However, there has been a recent change in the number of investors due to the connection between

digitalization and health care. Thus, it might be possible that companies start to become resource seekers when the number of investors increases.

Furthermore, it can be concluded that some companies are satisfied with Gothenburg's infrastructure. It has been communicated that the Gothenburg-Landvetter Airport is beneficial for travel. Also, the seaport has been viewed as beneficial for trade. There was some dissatisfaction about the current construction work. However, we argue that this challenge is not likely to make a huge impact on companies' location decision-making.

5.1.2. Market seeking

Companies are market seekers when they invest in foreign markets to reach new customers (Dunning, 2009). 12 out of the 15 companies in the sample chose to locate themselves in the Gothenburg region to expand their sales.

Navamedic ASA, Observe Medical, Optergo, Histolab Products, Coloplast, Touchpoint Medical Nordic, and Coremed Simonsen & Weel are examples of companies entering Sweden to develop themselves globally. Navamedic ASA entered the Swedish market through Navamedic AB in 2007. They entered through their acquisition of Vitaflo Scandinavia. One of their main goals was to increase their European presence through sales which still is their primary activity. Also, Optergo's respondent expressed that the company entered the Swedish market to become stronger. Further on, Histolab Products is a Swedish firm that the Finnish Algol Group acquired in 2017 to expand. Coremed Simonsen & Weel and Navamedic have acquired companies to increase their product assortment. Navamedic, a pharmaceutical company, acquired Observe Medical to sell medical technology. This is similar to Andersson et al., (2013)'s study, where they looked into the French medical technology cluster and found that the companies were mainly motivated to enter other markets to increase their sales.

In line with Andersson et al.'s (2013)'s findings, Coremed Simonsen & Weel were from the beginning a Swedish-owned company (Simonsen & Weel) who in 2018 were acquired by the Danish company Coremed. When Coremed acquired Simonsen & Weel, their main focus was to expand the product portfolio to increase sales, something the respondent expressed as a new sales force. They have close connections with Copenhagen, where the company's parent company is located. The respondent did also highlight that the Gothenburg region facilitates good communication with its customers.

Furthermore, it appears that the size of the home market might play a role when companies search for new markets. Sass (2012) studied Hungarian medical technology companies and their internationalization process. The author found that the most important motive was the market. These findings correlate with the findings regarding Touchpoint Medical Nordic as the respondent expressed satisfaction with the Swedish market since it is larger than the Norwegian market. Touchpoint Medical Nordic's respondent said that the founders developed an interest in the Swedish market and therefore chose to locate themselves in the Gothenburg region. Over the years, the Swedish market has grown to become almost twice as big as the Norwegian market.

In addition, Touchpoint Medical Nordic's respondent expressed that their main customer is the VGR. The proximity to their customers affects the software development, which means that the company is more adaptable. Other companies have communicated several reasons, such as Histolab Products's and Previa's respondents. Histolab Products's respondent expressed that they have chosen to stay local to their customers. Previa's respondent highlighted the cruciality of locating close to their customer since they have to be physically close to provide most of the services. The respondent also expressed that due to the high number of companies located in the Gothenburg region, the demand for Previa's services increases.

Furthermore, we have identified a pattern which is that the companies are mainly located for sales activities instead of for R&D activities. This finding is similar to Pisoni et al., (2010)'s results that companies often locate themselves in foreign markets to increase their sales instead of for R&D activities. Zeller and Van-Hametner (2018) have also found that companies invest more in sales than R&D abroad. They studied the Austrian markets and found that foreign companies mainly came to the country to set up sales offices rather than invest in production or research. This decision could possibly be influenced by the efficiency seeking motive, which will be discussed further below. Companies tend to move their R&D near their production facilities which are often located outside of Sweden.

5.1.2.1. Challenges

Coremed Simonsen & Weel and Previa's respondents expressed some dissatisfaction with the customer market in the Gothenburg region. Coremed Simonsen & Weel stated that most of the care places are located in the Stockholm region. Therefore, it would sometimes be

advantageous to have an office in the Stockholm region that would have located them closer to their customers. Furthermore, Previa's respondent expressed that some of the customers in the Gothenburg region always tend to seek the lowest price instead of the quality of the service. Therefore, the respondent expressed that the customers do not always receive the most health efficient product or service for the workplace as they value the price more. Thus, the respondent expressed a significant difference between the Gothenburg region and the Stockholm region, and the northern regions above Stockholm, as they are less price sensitive.

However, these indications can be argued back and forth, but they can be interesting to highlight since it indicates that the Gothenburg region's customers are viewed as significantly different compared to other Swedish regions regarding price sensitivity.

5.1.2.2. Overall Remarks

Regarding our findings for this study, the Gothenburg region seems to be a beneficial location for life science companies to increase their sales. This is supported by the results of our research, where 12 out of the 15 companies engage in sales activities in the region.

Most of the companies have located themselves in the Gothenburg region to grow stronger, increase their European presence, and expand their product portfolio. Some companies in the sample have expressed the importance of close proximity to their customers. As already mentioned, it appeared that most of the companies mainly located themselves in the region due to sales and not for R&D purposes.

5.1.3. Efficiency seeking

5.1.3.1. Cost-Efficiency

Efficiency seeking is when companies make decisions to make the supply chain overall efficient. Their goal could be to reduce the overall costs of their activities (Dunning, 1998). Four companies interviewed, Histolab Products, Guldmann Sverige, Observe Medical, and Oticon Medical, appeared to have this motive. Histolab Products and Guldmann Sverige's respondents discussed the location of their sales offices in Sweden. Both respondents have highlighted that the salaries in the region are less expensive than in other regions. For instance, Histolab Products's respondent preferred Gothenburg compared to the capital cities such as

Stockholm and Copenhagen. The respondent viewed those cities as more expensive than Gothenburg.

Thus, compared to capital cities, it seems to be perceived as less costly in terms of salaries. It seems that companies may avoid the capital city as it is viewed as more expensive in regard to salaries and rent compared to other cities. In the study by Smith (2004), he studied Oxfordshire and life science companies. He found that the city was avoided because of the high rental costs. Thus, it could be that companies that establish sales offices enter Sweden but avoid Stockholm and decide on other cities such as Gothenburg.

When it comes to production activities, it was not common for companies to move their activities to Sweden. Observe Medical's respondent highlighted that they preferred to work with a supplier in the Czech Republic to produce parts of their digital urine meter. The respondent claimed that the Czech Republic provides the best price and quality compared to other alternatives. This demonstrates that price is important, and that the region may be more expensive for certain activities than other locations.

Observe Medical's respondent also explained that they outsource and collaborate with suppliers because it is costly to work in-house. The respondent explained that when they expand, then they can have their own supply chain. This could potentially be connected to health economics. This theory explains that companies may feel pressured to be cost-effective for health cares to select them (Haycox, 2009). It could be that companies prefer to outsource their production to cost-efficient suppliers. This could explain the lack of production FDI into Sweden because it might be costly to manufacture in-house and establish a greenfield investment.

5.1.3.2. Supply Chain Restructuring

For the majority of the companies, the efficiency seeking motive was not a reason to be in Gothenburg. Companies did not tend to select Gothenburg to be more efficient in their activities. The typical pattern was that the companies in the sample mainly established a sales office, making them market seekers.

For the R&D centers, other locations were preferred instead of Gothenburg. From the interviews, it appeared that companies did not locate their R&D centers in Gothenburg because

their production was located in other countries. When companies decide on increasing efficiency, it might not be about the region itself but the organization of the activities in the supply chain (Zeller and Van-Hametner, 2018).

Touchpoint Medical Nordic and Guldmann Sverige's respondents discussed that their production and R&D are combined in the same building. The activities need frequent interaction between the two departments. Therefore, it is logical that the activities are not separated into different locations. Also, BioMérieux, a French biotechnology company, highlighted on their website that they moved their production facilities to France to be near their R&D centers for efficient product development (BioMérieux, 2008). Thus, the R&D centers might not have been placed in Gothenburg because of the structure of the company's activities. Even if the facilities are strong, as Zeller and Van-Hametner (2018) highlighted, the decision might be independent of the region.

5.1.3.3. Efficient Clusters

Efficiency is also about the strength of the economy. Dunning (1998) discussed that an entrepreneurial environment in a region could attract companies and be under the efficiency seeking motive. Companies may be seeking a region where there are clusters of companies present to collaborate with. This appeared to occur for two companies, Observe Medical and Oticon Medical. Both companies are medical device companies, and they stated that the region has an impressive medical technology industry. The respondent from Oticon Medical discussed how it is beneficial to be near other medical device companies.

This finding supports the argument in the literature by Le Duc and Lindeque (2018) that geographical proximity to other companies is viewed as helpful to grow. Companies may enter Gothenburg because other medical device companies are established in the region. In the article by Le Duc and Lindeque (2018), they looked into science parks in the Netherlands. They argued that geographical proximity to other companies has an impact. While the respondents were not referring to Sahlgrenska's Science Park, it still correlates to Le Duc and Lindeque's (2018) study because it is about the proximity of other companies. When companies are near others, it increases the chances of collaborations and knowledge-sharing.

Furthermore, it has been discussed by Devereux et al. (2007) that foreign companies may be in locations where other foreign companies are present. Head et al. (1999) also have argued that

the presence of foreign companies can influence companies, especially if they do not have much knowledge about the location. However, with our study, none of the companies expressed that. They did not mention that other foreign companies influenced their decision to select the Gothenburg region.

5.1.3.4. Challenges

Companies could have a challenge to produce in-house and would therefore view it as more efficient to outsource. As discussed before, Observe Medical collaborates with a supplier in the Czech Republic. Thus, it might be that companies decide to choose the most efficient suppliers, which might be in countries with lower costs than in Sweden. This could explain the reason that manufacturing is often in other locations. This connects to Zeller and Van-Hametner's (2018) study, where they explained that pharmaceutical companies usually do not build their own production facilities because it is expensive. They tend to work with contract manufacturers.

Moreover, Previa, Albireo and Observe Medical's respondents have expressed that collaborations with other companies in the industry have been a struggle. Previa's respondent had limited knowledge about the networking environment. They were not aware of other companies in the region that they can connect with. Therefore, the respondent suggested that BRG should promote the cluster more.

Lastly, Observe Medical's respondent provided suggestions to BRG that the organization could help companies connect with each other better. The respondent recommended that an index can be developed that states which are companies, consultants, etc. Also, BRG can provide contact opportunities for companies to connect with suppliers in the region. Many companies are in the early stages and rely on suppliers. Thus, it appears that some companies need assistance in connecting with others in the industry.

These findings indicate that BRG should evaluate its communication platforms to increase its awareness. Some of the respondents also expressed that they had been to meetings and conferences with BRG, which did not lead to further development. BRG should therefore also evaluate how they can follow up and meet the needs of the life science companies in the region. Lastly, among the respondents, BRG was often compared to the private organization Västsvenska handelskammaren, which provides support, legal advice, educations, networks

and more within the West of Sweden (Västsvenska handelskammaren, 2021). Therefore, we argue that BRG and Västsvenska handelskammaren should evaluate more collaborations with each other to strengthen the support for the life science companies in the region.

5.1.3.5. Overall Remarks

Overall, this motive only applied to five companies, therefore, it is not the most common in the sample. The main efficiency advantages in Gothenburg are the low costs for sales offices compared to capital cities such as Stockholm. Also, the efficiency of the medical technology cluster in the Gothenburg region. Furthermore, it appears that some companies are efficient-seekers and therefore do not have their R&D centers in Gothenburg because of the location of their production facilities. It is not about the research available but rather the organization of the supply chain.

It does seem that this motive does not affect companies' decision to stay. Companies appear to be successful in the region. While three companies have communicated that they struggle to connect to others in the region, it is only a small portion of the sample. If changes apply to the networking environment, it could enhance the region's reputation and satisfy the companies in the region. Thus, it would be helpful to consider new strategies to connect companies with each other to increase efficiency in the Gothenburg region.

5.1.4. Strategic asset-seeking

Dunning (2009) argued that this motive has become more common in influencing companies to invest abroad. He discussed that businesses are looking to increase their knowledge. This appeared to be a motive for eight of the companies, which is a large portion of the sample. Six of the strategic asset-seekers have established an R&D center in Gothenburg, engaging in greenfield investment. Observe Medical and Guldmann Sverige are the two companies that do not have an R&D center in the Gothenburg region but are considered strategic-asset seekers for other reasons. Based on the results, this seems to be the second most relevant motive among the companies in the sample.

5.1.4.1. Type of Research Investment

Six of the strategic asset-seekers have established an R&D center in Gothenburg, engaging in greenfield investment. This correlates with previous scholars' findings. Zeller (2004) studied the biotechnology industry in the U.S. and found that companies look for knowledge-intensive

locations for research activities. It appears that the strategic asset-seekers identified have engaged in R&D to increase their knowledge. It could support the theory that companies are engaging in home asset augmenting. They seek foreign knowledge to enhance their parent company (Von Zedtwitz and Gassman, 2002; Hamida and Piscitello, 2013). Companies may be learning from their subsidiaries abroad as they are having access to foreign knowledge.

The findings are similar to Conle and Taube's (2011) study. They have looked into the biotechnology cluster in China, and they have argued that while companies are mainly there as market seekers, some have opened up an R&D center in Shanghai. This is similar to our study as the most common motive is market seeking, but the second most common motive is strategic asset-seeking. Our findings also support the study by Gugler et al., (2015) that has referred to Dunning's framework in that strategic asset-seeking is increasing because companies are seeking knowledge.

Besides greenfield investment, strategic asset-seeking can also be done through acquisitions. Companies may acquire foreign companies to access their resources (Dunning, 1998; Knoerich, 2020). This appears to have been a strategy adopted by several companies in the sample. Cochlear, and Oticon Medical have acquired a Swedish company and entered the market. Oticon Medical acquired Otorix to have access to their research about hearing systems. Cochlear entered Gothenburg by acquiring a Swedish company called Entific for its research in BAHA, the bone anchoring hearing system. These results demonstrate that FDI is not always a greenfield investment. Some companies may enter the region through an acquisition to access the knowledge that Swedish companies have.

Regarding Observe Medical, they engage in research projects in the region, such as with the Chalmers University of Technology. Le Duc and Lindeque (2018) claimed that companies could be strategic asset-seekers with low investment into the region. They have found that companies establish a representative office to have a physical presence and access the knowledge in the location. With a representative office, they can collaborate with others in the region. This appears to apply with Observe Medical as although they do not have an R&D unit, they have an office in Gothenburg. With a presence in the region, they can collaborate with universities. Thus, it seems that companies may still invest in research activities even without establishing an R&D center.

5.1.4.2. Knowledge-Sharing in Collaborations

Many of the companies in the sample have collaborated with universities in Gothenburg. For example, NEOSS is a British company that has come to the region solely for knowledge. They came because of the research available in Gothenburg regarding osseointegration. Also, because of the knowledge available regarding dental implants, they have collaborated with the University of Gothenburg (Åkervall, 2017). Contrary to the majority of the companies in the sample, they do not engage in sales in the region. This is similar to Takara BIO, which only engages in R&D and manufacturing in the Gothenburg region. Takara BIO entered to have access to research in IVF (Pettersson, 2018). This supports the findings by Braunerhjelm and Helgesson (2007) findings that have discussed that companies may enter locations with universities available to collaborate with. They looked at Medicon Valley, which spans from Eastern Denmark to southern Sweden and concluded that the access to knowledge enhanced the cluster's reputation.

Other companies collaborate with universities: Oticon Medical, Albireo, Cochlear Nordic, Coloplast and Observe Medical. For instance, Oticon Medical's respondent explained that they currently have a PhD program at the University of Gothenburg. Moreover, they have collaborated with a PhD professor, Bo Håkansson, at Chalmers to gain more knowledge about hearing aids. He is a pioneer of the first bone-anchored hearing system and therefore holds valuable knowledge (Tumblin, 2014). Oticon Medical's respondent described that the region has beneficial knowledge regarding hearing systems. Belderbos et al., (2014) came to a similar conclusion as they studied pharmaceutical companies and discussed that companies seek to be in locations with academic nature and the possibility to collaborate with PhD students. Thus, it has similar findings as Oticon Medical collaborates with PhD students. This was also present in the study by Grillitch et al., (2019). The scholars looked at the medical cluster in Skåne and concluded that some companies found it beneficial to be near universities and hospitals to recruit competent people.

Moreover, Oticon Medical and Albireo's respondents have described Sahlgrenska as an efficient organization to collaborate with. Oticon Medical is collaborating with Sahlgrenska at the biomaterials center. This supports the report by Sahlgrenska Science Park (2018) that discusses that the biomaterials center is one of the region's strengths. The biomaterials center guides companies in their research. Albireo's respondent also expressed similar satisfaction.

Albireo is conducting its clinical phases for their liver disease medicine in Gothenburg and does not engage in sales activities yet. Albireo's respondent also discussed that they opened in Gothenburg to be near AstraZeneca. Since they are a spin-out from AstraZeneca, it is essential to be close to AstraZeneca to use the knowledge available. This is similar to the findings of Le Duc and Lindeque (2018) that studied Dutch Science Parks. They argued that companies could value science parks because of the access to scientific knowledge. Based on the results, it appears that Gothenburg is considered an effective region because of the possible collaborations for research activities.

5.1.4.3. Highly Skilled Labor Market

Observe Medical, Oticon Medical, Guldmann Sverige and Albireo's respondents discussed that the region consists of highly competent people. For instance, Observe Medical's respondent has stated that the region consists of useful professions such as engineers and consultants for medical technology companies. Guldmann Sverige's respondent also discussed that the city consists of competent individuals because large cities tend to have educated and experienced people. This was viewed as a benefit because they are available to recruit for the company. In addition, Albireo's respondent discussed that Astra Zeneca's employees provide consultancy services, which has assisted them with their strategy.

Thus, the region is viewed by some respondents as a beneficial location to hire valuable individuals. This is supported by a study by Kimelberg and Nicoll (2012), where they found that companies moved to Massachusetts, Boston mainly to hire highly skilled individuals. A limitation of this argument is that Kimelberg and Nicoll (2012) only looked at American companies moving to another state and not FDI. However, this was also present in the study by Grillitch et al., (2019). The scholars looked at the medical cluster in Skåne and concluded that some companies found it beneficial to be near universities and hospitals to recruit competent people. Thus, it could be that Gothenburg has a similar reputation and attracts FDI due to the highly skilled people available in the region.

Also, Guldmann Sverige's respondent compared Gothenburg and Stockholm and claimed that it is better to recruit in Gothenburg because employees tend to stay longer at the company. In Stockholm, it is expected that people remain temporarily in a company which negatively impacts the business as they lose the knowledge when they leave. It is preferred that people stay long-term in a company to keep valuable knowledge. Thus, it appears that Guldmann

Sverige's respondent prefers recruitment in Gothenburg than in a larger city such as Stockholm. Gothenburg could have a competitive advantage over Stockholm when it comes to human resource management.

5.1.4.4. Challenges

It is essential to acknowledge that some companies are only in the region for sales because they do not manufacture their own products. For example, Navamedic is a Norwegian pharmaceutical company that is reselling products to the Nordic market. These results support Zeller and Van-Hametner's (2018) findings that have discussed that pharmaceutical companies may resell products as they do not have the financial capabilities to hold their own research facilities. Thus, it is important to acknowledge that some foreign-owned companies that engage in FDI may only be involved in sales because that is the company's only activity. Research for life science companies takes years and has high costs, making it challenging for companies to introduce innovative products into the market (Styhre, 2015).

Furthermore, Observe Medical and Coloplast's respondents expressed that it can be challenging to recruit foreign employees. Observe Medical's respondent argued that the salaries are low in Gothenburg compared to the living costs, affecting recruiting employees from other countries. This finding is similar to Smith's (2004) study concerning Oxfordshire and life science companies. He argued that the housing costs in the city hindered employees from moving to the location. This appears to be the case in Sweden as well, as it can be challenging to convince individuals to move abroad to an expensive country. Thus, if companies aim to recruit internationally, they have to consider the salaries offered.

Coloplast's respondent also argued that international recruitment is a challenge in Gothenburg because the city is not viewed as a global region. The respondent compared Gothenburg to capital cities and believed it would be easier for recruitment in those locations. When comparing the strengths mentioned in the previous section, respondents from other companies did acknowledge that there are qualified people in the region. Also, Coloplast's respondent has acknowledged that there is a skilled labor market despite the lack of foreign employees. Thus, the region is not lacking competent people, but it might be a challenge to recruit foreign employees.

5.1.4.5. Overall Remarks

In regard to clinical trials, the majority of the companies did not discuss where they are located. When talking about their research activities, they mainly mentioned their collaborations with universities. We are only aware that Albireo is currently in the clinical phase and is conducting clinical trials in Gothenburg. Thus, there is a lack of information to analyze if companies select other locations for their clinical trials. There have been reports discussing a decline in clinical trials in Sweden. They have discussed that companies are looking to Eastern Europe instead of Western Europe and the Nordic countries to lower their costs (Sandström, 2014). This was also discussed by Zeller and Van-Hametner (2018). From their study on the Austrian market, they observed that companies are moving away from Austria for their clinical trials to Eastern European countries. Thus, it would be advised that Sweden promotes their research strengths to attract companies to conduct their clinical trials in the region.

Another challenge is international recruitment due to the high costs of living. However, it has been discussed by some companies that there are still competent people that are living in the region. From the sample, some companies in the region have R&D centers. Others have an office in the region but engage in research collaborations with universities. A few companies have entered through acquisitions. In general, the region is viewed as a strategic location for knowledge sharing, making this the second most common motive.

5.2. Country Origin

5.2.1. Nordic Countries

Based on the results, it seems that the majority of the FDI that is present in Gothenburg comes from Nordic countries. When studying the Nordic life science industry, there have been efforts to strengthen collaboration with the Nordic Life Science Conference (lif, 2021). Also, five organizations have cooperated in developing their ideas (Oslocancer, 2020). It has been highlighted by Sahlgrenska Science Park (2018) that collaboration with Nordic countries can lead to strength in innovation. Thus, it appears that the Nordic countries are collaborating with each other to strengthen their life science competencies. Since the Nordic countries are working with each other, it might be that the Nordic countries are engaged in investing in Sweden rather than being in competition with Sweden. Thus, it might be that inward FDI will mainly come from Nordic countries.

5.2.2. United Kingdom

There were only a few British companies from the sample identified. Three companies researched are; Albireo, Cochlear Nordic, and NEOSS. Albireo was the only company interviewed, and they conducted research activities. As mentioned before, Albireo is a spin-out from AstraZeneca and is currently in the clinical phase. Two other companies are involved with research activities which are Cochlear Nordic and NEOSS.

Brexit could change the situation and lead to an increase in British FDI into Sweden. Companies that need a CE mark for their products may consider opening an office in an EU member state (Dennis, 2020). Moreover, the decrease in EU nationals in the UK might push companies to enter other countries to have access to highly qualified people (Cohrt, 2019). It may be an opportunity for Sweden to attract companies considering relocating some of their activities from the United Kingdom. Sweden can develop a strategy to enhance the country's FDI in the life science sector.

5.2.3. France

BioMérieux and Takara Bio Europe are the only companies that have been included in the sample. BioMérieux has a sales office in the region, but their R&D and production facilities in France are near each other for effective product development. Takara Bio Europe entered Sweden by acquiring Collectis AB, and it is currently under the subsidiary. Collectis AB had limited resources and therefore needed to be acquired.

A possible way to attract French companies to come to Sweden is by focusing on digitalization and artificial intelligence (AI) technology. Cooperation between both governments has been established, which can be a possibility to attract French companies into the region. Both governments are currently working on a project where French and Swedish start-ups can collaborate for research. Vinnova, the Swedish innovation agency, and French Bpifrance will be a part of this project, and the aim is to develop innovations. Thus, it could mean that there will be a future collaboration with French companies in regard to research. Moreover, the two countries share an interest in several aspects such as; digitalization, fighting antimicrobial resistance (AMR), and endocrine disruptors. Since the two countries are collaborating, this may influence French companies to conduct research activities in Sweden to be near the companies they cooperate with.

6. Conclusion

6.1.1. Empirical findings

The most common motive is market seeking as the majority of the companies have a sales office in the Gothenburg Region except for Albireo and Oticon Medical. Therefore, it seems that Sweden is viewed as a market opportunity to expand and increase in sales. The second most common motive is strategic asset-seeking, which is that companies enter the region to acquire knowledge and capabilities. Eight of the companies are strategic asset-seekers, and they stay in Gothenburg because of the research competence in the region. The most common strategy is to establish an R&D center. However, two of the strategic asset-seekers, Observe Medical and Guldman Sverige, do not have an R&D center but do make use of the competence in the region. Lastly, strategic asset-seekers can also engage in acquisitions. This was a common method for several companies. This demonstrates that there can be Swedish start-ups that capture foreign companies' interest and motivate them to enter through an acquisition.

However, several companies have explained that due to supply chain restructuring, they have not located their R&D center in Sweden. They prefer to have their R&D near their production facilities, which are located in another country. Thus, it could be independent of what is available in the region that makes companies choose other locations for other activities.

In general, the region is viewed as an efficient location for research and competence. In the efficiency seeking motive, it has been discussed that an efficient cluster that is seen as increasing productivity in the society can attract companies. This appeared to be the case in this study, as the medical technology cluster in Gothenburg was viewed as efficient. Clusters are part of the efficiency seeking motive because collaborations can increase the efficiency of companies. However, there was some criticism regarding the networking environment. Several respondents suggested that BRG can assist companies more in collaborating with others in the region.

Regarding cost-efficiency, it appears that Gothenburg was not selected for production activities. Only three companies have engaged in production, which are Optergo, Takara Bio

Europe and NEOSS. This lack of production investment could be because of the high costs regarding production. There is a lack of information to make conclusions, but Observe Medical's respondent explained that they collaborate with suppliers. Thus, it could possibly be that companies decide to outsource rather than building in-house. Also, Observe Medical's respondent explained that one of their suppliers is from the Czech Republic because of the cost-efficiency. Therefore, it could be that other countries are preferred to Sweden for production to lower their costs.

Gothenburg was viewed as cost-efficient for sales offices when compared to other cities in Sweden. It appears that companies can decide to enter Sweden to increase in sales, but then choose other cities besides the capital cities, to lower their costs in rent or salaries. Their main aim could be to have a presence in the country and that it is not necessary to be in the capital city.

Regarding the resource seeking motive, this was the least common motive among the companies in the sample. None of the companies have entered to lower their costs in regard to natural resources. Moreover, it appeared that companies did not have financial support in the region. Albireo's respondent explained that there are few investors and that BRG should assist more in connecting companies to investors. While this is a current challenge, we argue that this situation might improve in the future. There has been an increase in investments because of the interest in digitalization in healthcare in the Gothenburg region. Lastly, several companies were satisfied with Gothenburg's infrastructure. There were a few criticisms regarding the current construction projects, but in general, companies considered the infrastructure positively.

Overall, it seems that sales and research are the most common activities in the Gothenburg region. Production is not generally located in Gothenburg, which could be due to cost-efficiency. In general, Gothenburg has been viewed as a valuable location for life science companies to gain knowledge.

6.1.2. Theoretical Contributions

Dunning (2009) has made a theoretical framework regarding the motives for FDI. There have been several studies that looked into the reasons that life science companies select a location.

As mentioned in the problematization section, Zeller and Van-Hametner (2018) discussed that there is limited research regarding FDI in certain industries. Moreover, Belderbos et al., (2014) discussed that future research could study location factors that influence companies to invest in another country.

We believe that our research has contributed to the literature regarding location factors. This thesis has included several location factors following Dunning's theoretical framework that may influence life science companies to invest abroad. We have contributed to the literature by concluding that life science companies may invest abroad mainly for marketing and research purposes. Furthermore, we have contributed in relation to Dunning's theoretical framework by discussing the dynamic nature of the motives. In our study, some companies have initially come for sales and then engaged in more activities in the region once they were established. This demonstrates that a region's location advantages can increase and lead to more investments from foreign-owned companies. Furthermore, since this study was mainly focused on the "L" aspect of the OLI paradigm, it contributes to the literature as it provides a deeper discussion on the location advantages.

Furthermore, our research consists of a discussion of the value of knowledge in a region. In our study, it has been viewed as a factor that motivates companies to be in a location. This supports Dunning's (2009) argument that the strategic asset-seeking motive has been increasing in popularity. Thus, this study has demonstrated that this motive is rising for companies to internationalize and gain a competitive advantage.

In addition, this study differs from other approaches because it includes a comparison of both the advantages and disadvantages. Challenges were identified that companies experience to compare to the advantages identified. This was to provide various viewpoints regarding the Gothenburg region. The majority of the articles identified mainly discuss the motives. Our study contributed to the literature by discussing challenges such as infrastructure, recruitment and financial support. To our knowledge, there was limited research on the challenges that life science companies may experience in foreign markets.

When we researched for articles, there was limited discussion regarding the life science sector specifically. Thus, this research could contribute to research on life science clusters. Also, from the articles identified, there was research on Swedish life science clusters in other regions but

not on Gothenburg. Thus, this study contributes to the literature as it is focused on the Gothenburg region.

6.2. Managerial Implications

A suggestion has been made to the BRG by one of the respondents concerning the networking environment. They highlighted that an index could be made to connect companies to suppliers and other companies in the region. Moreover, there were a few companies that were not familiar with the networking environment in the region. Therefore, it would be suggested that BRG finds new ways to increase awareness about the networking opportunities in the region. Another suggestion is that BRG should try to create more collaborations with similar organizations in the region, such as Västsvenska handelskammaren, to raise awareness both about them and the other organizations that most likely would bring more growth in the region.

The resource seeking motive was the least common motive for the companies in the sample. It did not appear that companies entered Sweden for lower natural resources or financial support. One respondent suggested that BRG can guide companies in finding investors as it can be challenging to have financial support. Since there are fewer investors than in other locations such as the United States, this can be an area that is difficult to be competitive in.

Looking at France and the UK, there was less investment from them in the life science industry. It can be possible that there is an increase in French FDI in the research activities as both governments are working together to increase collaboration between start-ups. For the French market, it would be suggested that BRG promotes Gothenburg's competence in digitalization and artificial intelligence. Regarding the UK, Brexit can affect companies' decisions in the future. It may be that they aim to establish sales offices in EU member countries, to have a presence in the EU market. This can be an opportunity for the region to attract more British companies in the region. Moreover, three of the companies in the sample are British and are both engaged in research activities in the region. Thus, it could also be possible that companies enter to have access to knowledge. Since AstraZeneca is present in the region, which can possibly motivate British companies to enter. Also, since Gothenburg has highly competent people, this might be an opportunity to encourage British companies to enter Sweden for research purposes.

Lastly, BRG should try to find ways to attract more production in the Gothenburg region since it appeared that almost none of the companies investigated were engaged in production in the region.

6.3. Limitations

Several limitations may have hindered the results of this study. We have received some rejections from companies to be interviewed. If more companies were included, it would have led to more results to compare and make conclusions. Moreover, not many French and British companies were included in the study. While not many of the companies contacted were French and British, it would have been beneficial to have a French company in the primary data.

Regarding the format of the interviews, the e-mail survey may be considered a disadvantage as it was not a semi-structured interview. The questions were sent beforehand, and it was not a dialogue. During a physical or video call, it is easier to adapt the questions according to the information that the participant provides. However, due to the participant's schedule, an e-mail survey was adopted. Furthermore, due to covid-19, the majority of the interviews were held on Zoom. There was only one company that was conducted face-to-face. It would have been beneficial to have more face-to-face interviews as it allows for better communication. While the video format on Zoom compensated, we argue that it cannot replace a face-to-face meeting.

Moreover, there were limitations when conducting digital research. There was limited research available, and it was challenging to find information regarding the motives for entering Gothenburg, Sweden. For some companies, the only information available was the current activities that they are involved in in the region. For the companies that left the region, it was challenging to find the reasons for their departure. It would have been advantageous to have more questions about companies' production activities. However, due to limited time, we had to decide on a certain number of questions.

Lastly, we acknowledge that there may be a subjective risk, possibly affecting the reliability of our study because only one respondent has participated from each company. It could be

possible that other employees in the company have different views on the Gothenburg region. Thus, this is taken into account in this study.

6.4. Future Research

There are other research fields that could be investigated within the life science industry. For example, the type of entry mode that a life-science company selects could be further studied. This was touched upon in the study, but outsourcing could be compared to FDI in future studies. It would be available to understand the type of entry mode that life science companies select when entering foreign markets.

Furthermore, Dunning (1998) has argued that there should be more focus on companies that select other countries for their activities. In our study, some respondents explained the reasons for choosing other locations instead of the Gothenburg region. This could be more deeply investigated, as we were more focused on studying the Gothenburg region specifically instead of comparing it to other locations. Since several respondents have explained that they select other countries to lower their costs, future research can study this type of strategy.

Moreover, it would be valuable to study the risks that companies consider when entering foreign markets and how they manage them. Since the life science industry consists of risk (Braunerhjelm and Helgesson, 2007) it would be interesting how they take risk into consideration in their decision-making. The risk factor could possibly impact their entry mode.

Another research field that could be studied is financial investments and life science companies. While researching for our study, we noticed that the life science industry faces challenges of gaining investments. Since it is an industry that takes a long process for commercialization and comes with risk, it can be difficult to gain access to investments (Styhre, 2015). Funding for life science companies in Sweden could be further investigated. Thus, these are our recommendations for topics that can be further researched.

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Appendix 1

As already mentioned in the method chapter, not all the questions were asked to the respondents. The questions asked has been dependent on the activities that the company engages in such as R&D, sales, and production. Down below are all interview questions:

1.1 Generic

1. When you came to the Gothenburg region, what were your main activities and had these activities changed along the way?
2. Which activities does the company do in the Gothenburg region at the moment?
3. What are the company's future plans in the region? *(If they want to answer)
4. Do you know about the *Business Region Gothenburg*?
 - a. If so, what has their role been in your business activities?
 - b. If not, does your company feel the need for an intermediary organization?

2.1 Motives

5. Why did the company locate itself in the Gothenburg region?
6. Are there highly skilled people available in the Gothenburg region and does it affect the company's location decision to come here?
7. Have your competitors affected your decision to come to the Gothenburg region?
8. Does the company face the pressure of being cost-effective and does it affect the company's location decisions?
9. What are your views of financial funding in Sweden?
 - a. Do you receive financial support?

2.2. Sales Activities

10. Why did the company open up a direct sales office in the Gothenburg region?
11. How has the company's performance been in sales regarding Sweden? (If they want to answer)

12. Why did the company decide not to locate their R&D to the Gothenburg region?
13. Why did the company decide not to locate its production activities to the Gothenburg region?

2.3 R&D Activities

14. Why did the company locate its R&D to the Gothenburg region?
15. Is your R&D center(s) located close to the company's production facilities?
 - a. If so, is it necessary to be near the production facilities? And why?
16. Does the company have connections with universities? (this answer will be a motive and a benefit of why they stay in the Gothenburg region).
17. What do you think about the R&D facilities in the Gothenburg region? (this answer will be both a motive and a benefit of why they stay in the Gothenburg region).

3.1 Benefits or Weaknesses

18. What are the benefits that make the company stay established in the Gothenburg region?
19. What do you think about the networking environment in the Gothenburg region?
20. Does the company have lots of collaborations in the Gothenburg cluster?
21. Does it matter to be close to other companies in the region?
 - a. Or are the collaborations global?
22. How does the quality of life (costs and living standards) affect foreign employees to locate in Sweden?
 23. What are your views about the corporation tax in the Gothenburg region?
 - a. Does the company feel that the tax affects the decision-making to come to the Gothenburg region?
24. What are the challenges of being located in the Gothenburg region?
25. What do you think can be improved in the life science cluster?

Appendix 2

The companies listed below are the companies that have been contacted through a phone call, email, and text message. We were not able to get in contact for different reasons with the following 28 companies (including the secondary data):

- NEOSS AB
- SECMA AB
- ORIOLA AB
- MEDIC24 AB
- LABRIDA AB
- BioMérieux AB
- MEDARTUUM AB
- MINICROSSER AB
- PARTNERMED AB
- BC IMPLANTS AB
- KCI MEDICAL AB
- OFELIA VÅRD AB
- HEALTH TECH AB
- FERNO NORDEN AB
- FÖRENADE CARE AB
- SMITH & NEPHEW AB
- LINVATEC SWEDEN AB
- SINCLAIR PHARMA AB
- COCHLEAR NORDIC AB
- SLUTPLATTAN TERPA AB
- TAKARA BIO EUROPE AB
- SCANVAEGT SYSTEMS AB
- GN HEARING SVERIGE AB
- SANA PHARMA SWEDEN AB
- NEUROSEARCH SWEDEN AB
- CASPARSSONS VÅRDHEM AB
- PLANDENT FORSSBERGS DENTAL AB
- PHARBIO MEDICAL INTERNATIONAL AB

