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Corporate foresight in Sweden

A quantitative comparison between Swedish and
European companies

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Affärsförutseende i Sverige

En kvantitativ jämförelse mellan svenska och europeiska företag

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Abstract

Studies show that the average lifespan of large companies is decreasing and that companies of today face a higher degree of market-saturation caused by globalization. In order for companies to stay alive, they need to scan for trends outside their business scope, which can be done by adopting *corporate foresight*. This thesis investigates the uniqueness of corporate foresight in large Swedish companies when compared to a European sample. The focus lies on measuring differences with regards to *need*, *capabilities* and *maturity* of corporate foresight. This thesis establishes that there is an ever-growing interest in studying corporate foresight from a Swedish perspective due to the high rate of innovation in the country. Based on a theoretical framework, a method is established for measuring the three main dimensions of need, capabilities and maturity. The data for the Swedish companies is empirical data from 11 Swedish companies gathered using a survey provided by the collaborator Rohrbeck Heger GmbH. The Swedish data is then compared to a European sample by using an existing database. Through the use of a quantitative method with two statistical tests, one non-parametric test (Mann-Whitney U-test) and one parametric test (Welch's t-test), several interesting differences were found. For *need*, it was found that Swedish firms act in a less dynamic environment than its European counterparts, but that Swedish firms' environment is more complex. For *capabilities*, Swedish firms have stronger internal capabilities with regards to *culture*, *method sophistication* and *information usage*. Finally, for *maturity*, Swedish firms have stronger perceiving abilities but weaker prospecting abilities than European firms. In summary, it is not possible to say that the overall need or maturity with regards to corporate foresight is greater or more advanced for Swedish firms. However, a conclusion is that Swedish firms have stronger capabilities for corporate foresight than its European counterparts.

Keywords: Corporate foresight, Strategic foresight, Strategy, Sweden, Europe, Maturity model, Business culture, Organizational culture, Future preparedness, Change management, Foresight maturity



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Sammanfattning

Studier visar att genomsnittslivstiden för stora bolag minskar, samt att dagens företag möter en högre grad av marknadsmättnad orsakad av globalisering. För att företag ska överleva behöver de skanna efter trender utanför deras nuvarande verksamhet, vilket kan göras genom att arbeta med *affärsförutseende*. I detta examensarbete undersöks unika egenskaper gällande affärsförutseende i stora svenska bolag jämfört med stora europeiska bolag. Fokus ligger i att mäta skillnaderna i *behov*, *färdigheter* samt *mognadsgrad* av affärsförutseende. Detta examensarbete konstaterar genom flertalet källor att intresset och behovet av att utforska affärsförutseende för svenska bolag finns, eftersom Sverige är ett av världens mest innovativa länder. Från litteraturstudien etableras en metod för att mäta nivåer på de tre dimensionerna behov, färdigheter samt mognadsgrad. Empirisk data har samlats in på 11 stora svenska bolag genom en enkätbaserad intervju, där tillgång har erhållits till en granskad enkät genom samarbetspartnern Rohrbeck Heger GmbH, samt tillgång till deras databas med europeiska bolag. Den svenska datan jämförs därefter mot ett europeiskt dataset, där en kvantitativ metod används för att jämföra dessa grupper; ett icke-parametriskt test (Mann-Whitney U-test) samt ett parametriskt test (Welch's t-test). Genom dessa tester erhålls flera intressanta skillnader mellan svenska och europeiska bolag. Gällande *behov*, visade resultatet att svenska bolag har ett lägre dynamiskt affärsklimat, men där affärsklimatet är mer komplext. Gällande *färdigheter* skiljer sig svenska bolag på de interna färdigheterna *kultur*, *metodraffinering* samt *informationsanvändning*. Slutligen, gällande *mognadsgrad* för affärsförutseende, är svenska bolag starkare på att *uppfatta trender* men svagare på att *analysera trender*. Sammanfattningsvis är det inte möjligt att dra någon slutsats överlag huruvida behov och mognadsgrad gällande affärsförutseende är mer avancerat bland svenska bolag. Däremot kan slutsatsen dras att svenska bolag har starkare färdigheter för affärsförutseende än dess europeiska motsvarigheter.

Nyckelord: Affärsförutseende, Strategisk förseende, Affärsstrategi, Sverige, Europa, Mognadsgradsmodell, Företagskultur, Organisationskultur, Framtidsberedskap, Förändringsarbete, Mognadsförutseende

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Foreword

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Hans De Geer

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1. Introduction

This chapter consists of an introduction to this thesis. It begins with a brief background, which is followed by problematization, purpose and aim, research questions and delimitations. The chapter ends with stating expected research contributions as well as the outline of the thesis.

1.1. Background

A well-known fact is that companies aim to be profitable. For a company to be profitable, revenues must be greater than costs. A company that fails to be profitable will eventually go out of business. Consider the following example. In 578 AD, a construction company named Kongo Gumi was founded in modern-day Japan. The construction company specialized in construction of Buddhist shrines, and was the world's longest surviving family business. In 2006, the firm was forced to liquidate due to high debt levels and an unfriendly business climate, and thus, the world's oldest family business came to an end (Hutcheson, 2007). Unfortunately, the story of Kongo Gumi is not unique.

Two recent examples from Sweden are the automobile manufacturer SAAB that declared bankruptcy in 2011, and the shipbuilding yard Götaverken that went out of business in 2015 (Carlsson, 2015). These three companies illustrate the problem that most companies face; that it is impossible for a company to not expand or develop new production methods or strategies and still remain in business (Schumpeter, 1943). All companies are eventually forced to adapt to their environment, whether it takes 60 years as with SAAB or 1500 years as with Kongo Gumi.

This adaptation of companies to their environment is a cornerstone in the Austrian philosopher Joseph Schumpeter's view of companies in an evolutionary economy (Schumpeter, 1943). Using the Schumpeterian approach to explain industry dynamics, it is possible to view the world of companies as a world of constant disequilibrium but in constant evolution. Each firm continuously strives to obtain the most efficient production method or strategy (Iwai, 1984). Given a long enough timeline, all companies will either adopt the most efficient production method or go out of business (Iwai, 1984). However, the evolution of companies has no fixed end state, and it is likely that over time a more optimal product or a better production method is created by one of the companies, forming a new goal for the rest of the firms to adapt to. Those who fail will go out of business, thus continuing the cycle of "creative destruction" (Schumpeter, 1943). However, companies not only need to adapt to gradual changes in the industry, but also should be aware of discontinuous as well as radical changes and try to manage these by innovation management and corporate strategy (Tushman et al., 1986). The ability to detect, analyze and act upon these discontinuous and sometimes radical changes is named *corporate foresight* (Rohrbeck, 2011).

Højland and Rohrbeck (2017) define corporate foresight as the three steps *perceiving*, *prospecting* and *probing*. Perceiving is the first step in the foresight process, where the company scans and retrieves information about trends. Prospecting is the second step, where the gathered information is interpreted to the company's strategy by using methods such as scenario planning. The third and final step, probing, is to transfer the

information to different parts of the organization and taking actions such as testing new value propositions and market acceptance (Højland and Rohrbeck, 2017). To clarify the concept of corporate foresight, an example will be demonstrated. In 2004, the American company General Electric (GE) discovers *water scarcity* as an upcoming mega-trend, which is the perceiving phase. During the next phase, the prospecting phase, GE found that this trend had a lot of synergies with the existing energy business. Next, in the probing step, a R&D pilot plant for water scarcity business was constructed and through various acceleration programs the energy and water business constituted 31% of GE's EBITA in 2013, where the water business stood for approximately two-thirds of this percentage (Rohrbeck, 2017).

A positive company example, where the importance of being able to respond to discontinuous change becomes clear, is the Finnish company Nokia. Founded in 1865 as a paper mill company, the company later moved into rubber tire and boots production onward to become the telecommunications company it is today (Nokia, 2017). This amazing adaptability is perhaps what has saved Nokia from a fate similar to SAAB or Götaverken. Interestingly, Nokia can also be viewed as a company slow to detect and act upon important trends in one aspect. During the rapid progression of smartphones, Nokia was too late to adapt to this change resulting in a massive revenue decrease from which the company has not yet recovered.

As highlighted by the examples above, a key component in a company's ability to act upon radical changes is innovation (Enkel et al., 2009; Rohrbeck and Schwarz, 2013). This importance of innovation becomes interesting when viewing the issue in a Swedish setting. In 2016, Sweden was voted for being European Union's most innovative country (European Commission, 2016). In 2017, Sweden was voted to be the second most innovative economy in the whole world (Jamrisko and Lu, 2017). According to Magnus Henrekson, director of the Research Institute of Industrial Economics, which is a private foundation in Stockholm, Swedes promote an atmosphere of great personal ambition and a culture where people are very interested in pursuing their ideas in a way for them to become wealthy. Also, Henrekson states that Sweden focuses a lot on R&D (Jamrisko and Lu, 2017).

Since Sweden appears to be at the global top of innovative countries, are Swedish companies more able to act upon discontinuous and radical changes in their business environment? Are Swedish companies more developed in the area of corporate foresight when compared to similar companies from other countries?

1.2. Problematization

As of today, the average lifespan of large companies is decreasing. A study made by the Boston Consulting Group (Reeves and Pueschel, 2015) shows that the average lifetime of 35,000 listed companies in the US has significantly decreased from 55 years to 35 years or less. Studies done by Richard Foster (2011) on the longevity of companies on the S&P 500 index found that the average lifespan on the S&P 500 index has decreased from 60 years in the 60's to only 20 years today. Doane and MacGillivray (2001) find a similar result on the FTSE 100 with increasing company churn rate on the index. While the company does not necessarily go out of business after leaving the index, it still implies that they are not as prominent as before. Foster's (2011) projection is that this lifespan will continue to decrease, which implies that in the future, companies will last even shorter before dying or disappearing. However, Daepf et al. (2015) state that a company death is not always similar to the

biological concept death. Instead, they find most companies' fates are due to mergers and acquisitions or similar processes. Nevertheless, this still means that the acquired company's business will change. For companies to avoid these increasingly frequent mortality events they could strive to maintain their competitive advantage by increasing their pace of innovation (Rohrbeck and Schwarz, 2013).

One important factor that complicates today's business environment is globalization (Jonsson and Foss, 2011). Markets are no longer dominated by local actors, but instead of large multinational corporations who in turn face a higher degree of market saturation than before (Moran, 2013). This leads these companies to an increasing degree having to continue to expand and find new business opportunities (Botha et al., 2014). If a market is saturated, there is a need for securing future revenue streams, where one way of doing this is by further international expansion (Yoder et al., 2016). However, as Yoder et al. (2016) note, this is accompanied by a large amount of risk and uncertainty. Thus, other ways of increasing revenues might be attractive for companies. One other way is through increasing R&D, and by that expanding the product or service offering of the company (Kim, 2011). It should be noted that the R&D of companies is rapidly expanding, both in scope, but also in budget (Jackson et al., 2002). However, companies must make sure that the R&D conducted is relevant for the business, and not become victims of over-investing (Kim, 2011).

In Sweden, there are many large companies with both local and global operations. As above mentioned trends show, companies' lifetimes have decreased, as well as the difficulty to secure future revenues and profits. These negative factors can affect Swedish companies as well (Entreprenörsskapsforum, 2012). Even though Sweden is a world leader when it comes to innovation (European Commission, 2016; Jamrisko and Lu, 2017), it does not necessarily mean that Swedish companies are more proficient in dealing with discontinuous and radical changes. Thus, it becomes of interest to study Swedish companies' corporate foresight abilities when compared to other companies with different nationalities. A study made by Rohrbeck and Schwarz (2013) investigated the overall corporate foresight abilities among European companies. The study showed that the companies that were the most likely to survive in a longer time frame were companies that showed more advancement in corporate foresight.

To summarize, it is possible to outline two current trends strengthening the need for corporate foresight. One trend is the shrinking lifetimes of companies and the other is the need to secure future revenues in an increasingly saturated market. Combined with the innovation levels of the Swedish business climate, this leads to an interest to study the current corporate foresight need, capabilities and maturity of large Swedish companies.

1.3. Purpose and aim

The purpose with this thesis is to examine the differences in need, capabilities and maturity for corporate foresight in large Swedish companies compared to large European companies. The goal is to find whether there exists a difference in any of these dimensions. If so, how do they differ, and what are the underlying reasons?

1.4. Research questions

The research questions that this thesis will answer are the following:

RQ1: *Are there any differences between large Swedish companies compared to large European companies when it comes to need, capabilities and maturity of corporate foresight?*

RQ2: *If yes, how and why are they different?*

1.5. Delimitations

The following delimitations have been made to conduct the research in the given timeframe:

- This thesis is done in collaboration with the German-based consultancy firm Rohrbeck Heger GmbH. The collaboration with enables the use of their peer-reviewed survey for this thesis' data collection, which will be further explained in the method section 3. Also, the collaboration gives the opportunity to use their database consisting of large European companies, which will be used as the peer group sample. Furthermore, the collaboration enables the use of Rohrbeck Heger GmbH's analytical tool when aggregating the survey questions, which will be further explained in section 3.3.
- The thesis is delimited to Swedish companies because of three reasons. The first and main reason is that the authors of this thesis are based in Sweden and Stockholm more specifically. This gives easier access to interview respondents and minimizes possible cultural clashes that can arise when doing research abroad. Secondly, the fact that no study so far has been made focusing primarily on the role of corporate foresight within Swedish companies plays an obviously important part. Thirdly, Rohrbeck Heger GmbH is interested in learning more about corporate foresight in Swedish companies, thus creating great synergy with the previously mentioned reasons.
- The thesis will solely focus on large companies, and the definition of a large company according to the European Union (2003) is defined as:
 - At least 250 employees
 - At least €50 million turnover or at least €43 million in total balance sheet.

Also, it interesting to investigate large Swedish companies whether they are publicly traded or not, and therefore it is not of relevance to select companies from the stock exchange list.

Above decisions was based on an agreement with Rohrbeck Heger GmbH, as well as an earlier research made by Rohrbeck and Schwarz (2013), where midsized companies were included in the sample selection but was later removed because it was difficult to grasp relevant data from them.

- The sample selection of Swedish companies will be compared to an already-existing sample of large European companies. This peer group comes from Rohrbeck Heger GmbH's database, where European companies in this thesis are defined as Western European companies. Countries that are defined as Western

Europe are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom (World Bank, 2017). More details on the European sample will be described in section 3.2.4.

- Each interviewed company has only one respondent in the Swedish sample due to time restrictions.

1.6. Expected contributions

This thesis about corporate foresight concerns a specific geographic region, namely Sweden, but also its European counterparts for comparison purposes. Earlier research has previously been done in specific regions for the subject of corporate foresight. For example, Koniuk and Sacio-Szymańska (2015) performed a study among Polish companies regarding assessing the maturity level of foresight. Another example is the research done by Vishnevskiy et al. (2015) where they investigated in integrated roadmaps and corporate foresight as tools of innovation management among Russian companies. A third example is a research conducted by Alsan (2008), where he examined corporate foresight in emerging markets, in this case a multinational company in Turkey. In general, most corporate foresight studies have been conducted in developed markets, where the majority has been done in Europe, which is further explained in the theoretical framework in section 2.

This thesis is expected to contribute to today's research on corporate foresight in three ways. Firstly, it aims to give more knowledge about corporate foresight among Swedish companies, since as of today this area is underexplored. Therefore, concrete conclusions about Swedish companies' need, capabilities and maturity in comparison to European companies will be one of the goals with this thesis' contribution. Secondly, this thesis aims to contribute by using a quantitative method of research, which will be further explained in the method section 3.3. Since quantitative methods within corporate foresight has been performed in a very limited way before, this thesis wants to prove that it is possible to use such a method and still obtain interesting results. Thirdly, this thesis aims to validate the survey used for collecting empirical data, which will be further explained in the method section 3.2.2. If the survey can be validated, in the sense of it measuring the right variables to be able to draw important conclusions, this thesis will confirm the usage of this survey and encourage future researchers to reuse it as well.

Overall, corporate foresight is a rather new research topic with a limited number of articles published in the field. This thesis also aims to contribute to this research field by adding additional perspectives, insights and arguments outlined in this master thesis.

1.7. Outline

The thesis outline can be viewed in Table 1.

<i>Chapter</i>	<i>Content</i>
1. <i>Introduction</i>	This chapter includes a background to this thesis followed by problematization, purpose and aim as well as the research questions that have been investigated. Furthermore, delimitations and contribution to existing research are acknowledged and discussed. The chapter ends with a thesis outline.
2. <i>Theoretical framework</i>	This chapter is the theoretical framework of which the method is based on. The literature starts with connecting corporate strategy with corporate foresight, which is followed by a thorough review of corporate foresight. The chapter ends with aspects that are unique for Swedish business culture and a research hypothesis.
3. <i>Method</i>	In this chapter, the overall research design is described, where the data collection and data analysis are thoroughly explained. Lastly, ethics and quality of analysis are discussed through reliability, validity and generalizability.
4. <i>Empirical results</i>	In this chapter, the results of the research are presented, where the results are presented in three blocks; environmental dynamics (need), internal capabilities and corporate foresight (maturity). At the end of the chapter, a summary of the results is presented.
5. <i>Discussion and analysis</i>	In this chapter, a discussion is made of the results and the chosen method for the thesis. First, the discussion of the results from the two statistical tests is made, and then a discussion on each sample group is made separately. Finally, a discussion of the statistical tests is done.
6. <i>Conclusion</i>	This chapter is divided in three parts. First, the answer to the research questions and the research hypothesis is made. Secondly, a discussion on sustainability implications for corporate foresight is made. Thirdly, research contributions and a proposition to future research is made.

Table 1 – Thesis outline

2. Theoretical framework

This chapter contains literature on the connection between corporate strategy and corporate foresight. Further, the concept of corporate foresight is thoroughly examined, and how Swedish companies potentially differ in their approach from European companies. The aim with the theoretical framework is to create an understanding of what corporate foresight is and why it is needed, not to completely cover the implementation of corporate foresight. The chapter ends with a research hypothesis.

2.1. Paradigms of strategic thought

Corporate strategy can roughly be defined as *investigating the field of how firms handle strategic challenges*. According to Teece et al. (1997), there can be said to be four distinct paradigms of strategic thought regarding corporate strategy. These are as follows:

1. Competitive forces perspective

This paradigm builds upon the work of Porter (1980) who created a five-forces framework, which became a strategic paradigm for industry analysis. The five different forces influencing a company's behavior are *barriers to entry, bargaining power of suppliers, bargaining power of customers, threat of substitution and internal rivalries* (Porter, 1980). There are some limitations to the model, since it performs poorly in the aspects of path dependency and market trajectories (Teece, 2007).

2. Strategic conflict perspective

In 1989, Carl Shapiro laid out a new strategic framework based on game theory. The theory concludes that corporate strategy cannot only be seen in the light of a single company doing what is optimal for itself. Instead, the strategic view should be based around how companies interact with each other in a complex environment (Shapiro, 1989). Shapiro (1989) further argues that there is a strong argument to be made by utilizing a game-theoretical approach for understanding the relationship between strategic decisions and tactical competition.

3. Resource-based perspective

The resource-based perspective states that the main factor that influences a company's ability to gain a competitive advantage is access to certain resources (Wernerfelt, 1984). It is thus not how firms act against each other that is the core of strategy, but instead what unique resources a company has at its disposal (Wernerfelt, 1984). These resources should yield a competitive advantage, be rare, hard to imitate and be non-substitutable (Barney, 1991). However, the resource-based perspective often fails to explain how firms are able to gain a competitive advantage in dynamic markets (Teece et al., 1997).

4. Dynamic capabilities perspective

Teece et al. (1997) are one of the first to introduce a *dynamic capability framework* with the purpose to identify the foundations necessary for a company to be able to maintain, create and enhance advantages that are distinct and difficult to replicate. Compared to the competitive forces paradigm, the dynamic capabilities perspective does not only consider the relevant industry, but the entire business environment ranging from competitors to legislators, from suppliers to research institutions and so on (Teece, 2007). Furthermore, the framework takes better into account

Schumpeterian dynamics, trajectories and path dependencies not covered by the other paradigms (Teece et al., 1997). Teece (2007) argues that the framework of dynamic capabilities can be broken down into three parts. First, to sense and shape trends, both positive and negative. Secondly to seize the opportunities and thirdly to maintain competitiveness through continuous enhancement, protection and reconfiguration of a firms' total assets (Teece, 2007). The names used for these phases are *sensing*, *seizing* and *transforming*. As Højland and Rohrbeck (2017) argue, there are three distinct phases of corporate foresight; *perceiving*, *prospecting* and *probing*. Through these principles, a clear connection with Teece's (2007) earlier established dynamic capabilities can be seen. Thus, putting the concept of corporate foresight in line with the dynamic capabilities paradigm of strategic thought. As Rohrbeck (2011) notes, the concept of corporate foresight is closely linked to achieving success within the dynamic capabilities paradigm.

2.2. Corporate foresight

Corporate foresight is a relatively new research topic, which is explained in different ways. It has been argued that the terms *strategic foresight*, *organizational foresight*, *business foresight* and *prospective thinking* are used synonymously with corporate foresight (Liebl and Schwarz, 2010; Rohrbeck and Schwarz, 2013). There is also some debate whether or not to separate the two concepts *corporate foresight* and *strategic foresight*. Vecchiato and Roveda (2010) prefer to use the term strategic foresight as compared to foresight to highlight the close relationship between foresight work and strategy, but it has been argued that strategic foresight should be used as a term for the study of macro-economic processes, for example the study of national and governmental decision-making, while corporate foresight is the definition of the application of strategic foresight in corporate organizations (Rohrbeck et al., 2015). In this thesis, only the nomenclature corporate foresight will be used.

2.2.1. Background

The origin of corporate foresight traces back to the 1950's, where two schools emerged at the same time. One of them was the *prospective thinking school* based on the French philosopher Gaston Berger's thoughts (Berger et al., 2008) and the other was the RAND school in the US based on the thoughts of Herman Kahn, called *the Foresight school* (Rohrbeck et al., 2015). The main difference between these different ways of thinking was that the prospective school to a greater degree involved decision-making stakeholders in the foresight process and perhaps this is the reason for its dominance in today's research (Rohrbeck and Schwarz, 2013). Over time, the field evolved, for example scenario planning evolved during the 60's and road-mapping developed during the 80's. Today, the focus of corporate foresight research is the process of incorporating it as a corporate capability. For example, just as a company has a marketing as well as a R&D function, the company should also strive to incorporate a corporate foresight function in their organization (Rohrbeck et al., 2015).

Corporate foresight is a rapidly expanding research field. According to Rohrbeck et al. (2015), over 100 research papers regarding the field were published in the time period between 2005 and 2014. While this is not a huge number of research papers, it should be compared to the previous decade between 1995 and 2004, which saw only eight published articles in the field and the decade before that, between 1985 and 1994, when only one single article was published (Rohrbeck et al., 2015). What

corporate foresight does, is that it allows organizations to lay a foundation of future competitive advantage by identifying, observing, and interpreting factors. These factors induce change, determine possible organization-specific implications and help trigger appropriate organizational responses. The work with corporate foresight often involves multiple stakeholders, since it requires large and different parts from the organization to work together (Rohrbeck 2011; Rohrbeck et al., 2015).

In summary, the concept of corporate foresight emerged from Europe, and to some degree from the US. However, as Højland and Rohrbeck (2017) note, the research on corporate foresight has only focused on Western markets. Thus, it is natural that the company examples in previous research are from a Western perspective.

2.2.2. Definition

The term corporate foresight regards research activities in organizations' futures (von der Gracht et al., 2010). But as a research topic, it has been defined mainly in two different ways; as a *process* (Becker 2002; Horton 1999) and as an *ability* (Slaughter, 1998; Tsoukas and Shepherd, 2004). However, the definition of corporate foresight as an ability is more widespread (Rohrbeck, 2011) and therefore it will be used in this thesis.

The definition of corporate foresight as an ability is based on three assumptions. Firstly, there are multiple possible futures and thus the future is uncertain. Secondly, change and its drivers are possible to study and document. Thirdly, it is possible to influence the future (Rohrbeck et al., 2015). Rohrbeck (2011) summarizes the definition of corporate foresight according to the following:

“Corporate foresight is an ability that includes any structural or cultural element that enables the company to detect discontinuous change early, interpret the consequences for the company, and formulate effective responses to ensure the long-term survival and success of the company” – Rohrbeck (2011).

2.2.3. Need for corporate foresight

As argued in section 1.2., companies' life cycles have decreased dramatically and will keep decreasing in the future (Foster, 2011; Reeves and Pueschel, 2015). Furthermore, the globalization trend forces large multinational companies to face a higher degree of market saturation, which in turn leads to reduced growth opportunities in their ordinary markets (Jonsson and Foss, 2011; Moran, 2013). In addition, only a few organizations are able to maintain a high level of innovation in order to prolong the company's life cycle (Winby and Worley, 2014). Teece et al. (1997) note that in order for a company to sustain a competitive advantage, a company needs to exploit both internal as well as external firm-specific capabilities. Firms that are aware that the strategy of today might not be the one of tomorrow often strive towards maintaining the necessary organization, knowledge and experience in order not only to implement the current strategy, but also to explore distant ones (Winby and Worley, 2014). However, as Teece (2007) notes, the need for different levels of dynamic capabilities varies based on the business environment. A more hostile and rapidly changing environment requires a higher level of dynamic capability.

During the latest decades, the relatively stable, smooth and significant growth in the world economy has led to high profits for businesses in the Western world. However,

this is unlikely to continue the upcoming years. An ageing population resulting in lower growth together with rapid technological change as well as fiscal challenges due to the large amounts of government debt will likely have a negative impact on the years to come (Ringland, 2010). Staying afloat by maintaining a higher evolutionary fit is more difficult nowadays than it was before the millennium shift, and firms need to use multiple different perspectives and tactics in order to succeed in their respective markets (Somaya and Teece, 2008).

Ratcliffe (2006) argues that a new mindset is required by corporate organizations to anticipate and prepare for the future. The mindset should address societal, environmental and economic essentials. Most importantly, the mindset should tackle complexity, uncertainty and change, where Ratcliffe (2006) argues that maybe the secret to success is a futures orientation with strong foresight capability. Winby and Worley (2014) argue that an increasingly complex business environment favors innovation and agility and that organizational change, done correctly, is necessary for doing business. Teece (2007) argues that for a firm to survive in an increasingly volatile business environment, firms need to be innovative and adapt to a changing environment. As such, there is a strong argument for the firms and companies of today to be increasingly aware to changes and disruptions, due to the speed and impact of these events.

Moreover, the rapidly changing markets with compressed product life cycles and new product entrants create a less secure company product portfolio, which combined with a firm's need for exploration of new business models lead to a strong need for corporate foresight (Hammoud and Nash, 2014). As of today, multiple firms report that the primary use for foresight is either innovation or competitive advantages (Hammoud and Nash, 2014). As such, Rohrbeck and Gemünden (2011) find that by using corporate foresight in three different roles – *strategist*, *innovator* and *opponent* – the overall innovation ability of a firm can be improved.

Day and Schoemaker (2005) are among the first to propose that a firm must not only consider its actual strategic ability, but also how great the need is for different strategic alternatives. A company that acts in a more stressful environment will have a higher need for corporate foresight than a firm acting in a simpler environment. They propose two different dimensions for measuring need for corporate foresight; *environmental volatility* and *environmental complexity* (Day and Schoemaker, 2005). Calantone et al. (1997) highlight the importance of a dimension called *environmental hostility*, which focuses on intense rivalries between firms. Rohrbeck and Kum (2017) build on these needs for corporate foresight and summarizes them as the mentioned three environmental needs. The only difference is that they name environmental volatility as *environmental dynamism*. In summary, it is possible to measure a company's need for corporate foresight through the use of the following dimensions (Calantone et al., 1997; Day and Schoemaker, 2005; Rohrbeck and Kum, 2017):

- *Environmental Dynamism* – For example matters regarding the speed and direction of change in the industry, the speed and direction of market growth and the predictability of the industry itself.
- *Environmental Complexity* – Measures among others matters regarding industry definition, supply chain structure, regulatory environment and macro-economic dependence.

- *Environmental Hostility* – For example how risky the industry in itself is, the funding climate in the industry as well as the possibility of single-firm dominance.

Finally, it can be said that due to the rapidly changing business environment and the increasing competitive landscape, there is a need for companies to work proactively and have a long time frame for their activities. Several researchers argue that the key to succeed with this is to increase the focus on corporate foresight (Ratcliffe, 2006; Rohrbeck 2011; Hammoud and Nash, 2014; Rohrbeck et al., 2015).

2.2.4. Capabilities for corporate foresight

For a corporate organization to be able to successfully work with corporate foresight, it is important that it has the proper internal capabilities. Teece et al. (1997) note that in order for a company to effectively use the dynamic capabilities concept, there is a need for a solid foundation for these concepts to thrive. Teece (2007) calls these internal capabilities *micro-foundations* and argues that these must be in place for a firm to successfully be influenced by the dynamic capabilities framework. To conclude, the three main micro-foundations can be roughly summarized as *analytical systems*, *enterprise structures* and *continuous alignment* (Teece, 2007). Furthermore, Day and Schoemaker (2005) propose five different capabilities for detecting change; *Leadership*, *knowledge management systems*, *strategy making*, *organizational configuration* and *culture*. Rohrbeck (2011) builds on the micro-foundations of Teece (2007) and Day and Schoemaker (2005), but widens the scope and defines these capabilities as five internal capabilities:

- *Organization* – for example if future insights are triggered top-down and issue-driven or both top-down and bottom-up. This capability examines the leadership of the company.
- *Information usage* – how the company gathers information, through what sources and what time horizon they use as well as how the information is interpreted.
- *Culture* – how open the company's culture is, for example if the people within the organization are willing or allowed to share information across different functions and divisions.
- *Method sophistication* – what methods the company uses when determining a company strategy. Examples can be road-mapping, scenario analysis and *backcasting*, where backcasting is to imagine yourself in a certain future, and then considering which steps that where necessary to take in order to get there (Thorén and Vendel, 2017).
- *People & networks* – How good the company's internal and external network is. Does the company collaborate with other companies or are they isolated? Are the employees encouraged to build networks between departments or outside the company or is this not encouraged?

These five capabilities in accordance with Rohrbeck (2011) are summarized in Figure 1. Koniuk and Sacio-Szmanska (2015) also refer and use these internal capabilities in their research on corporate foresight.

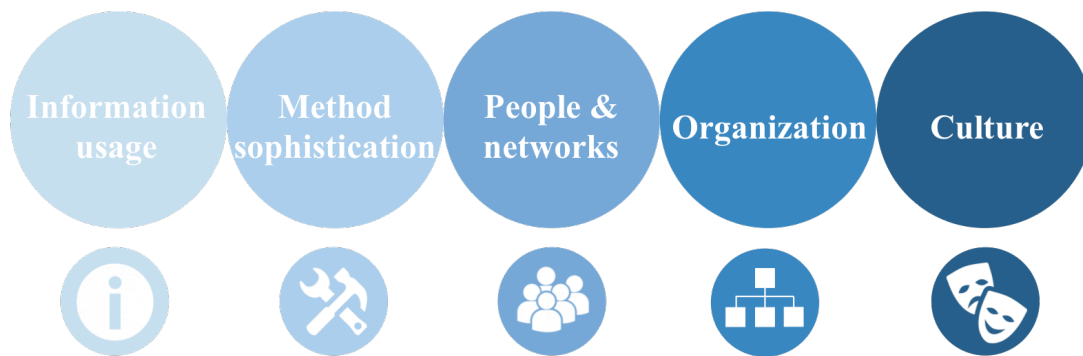


Figure 1 – Five internal capabilities (Rohrbeck, 2011)

Daheim and Uerz (2008) find that the underlying success factors for corporate foresight is characterized in six different dimensions; *quality of results*, *strategic relevance*, *participation*, *communication*, *culture* and *commitment*. These success factors have a high degree of overlap with Rohrbeck’s (2011) proposed capabilities.

Heger and Rohrbeck (2012) argue that the key to success for corporate foresight activities is to integrate top management in the process, and to integrate key stakeholders and multiple perspectives from different sources. Furthermore, Rohrbeck and Gemünden (2011) find that it is important that it exists a broad knowledge base together with a strong external and internal network. Additionally, Norling et al. (2000) mention the importance of having employees with relevant experience and skills when dealing with matters regarding corporate foresight. This view is also shared by Rohrbeck (2011). Lastly, Ruff (2015) argues that the foresight process needs to be closely integrated in the rest of the strategic work and that it needs to accompany the innovation process until the strategic decisions are made. All these findings point towards a company’s internal capabilities being important for the foresight process.

2.2.5. Maturity of corporate foresight

From the previous sections 2.2.3 and 2.2.4, the conclusion can be drawn of what influence a company’s need and usage of corporate foresight are environmental need and internal capabilities. Now, the focus lies on investigating what the processes for corporate foresight actually are, and how the maturity of these can be assessed. In the literature, it is found that almost all literature use the same steps when identifying corporate foresight processes. Presented in this thesis is the corporate foresight maturity process given by six different scholars.

Højland and Rohrbeck (2017) use three steps in corporate foresight called *perceiving*, *prospecting* and *probing*. The first step, *perceiving*, means sensing and identifying key trends that will make the business more successful. The second step, *prospecting*, is understanding the importance of the identified key trends and putting it in a time frame in order to act on it. The third step, *probing*, is to make practice out of above through for example R&D, innovation, partnerships and M&A activities.

Ratcliffe (2006) argues that the three distinct phases of any “futures” exercise are called *divergence*, *emergence*, and *convergence*. Divergence is the first phase where companies are exposed to a multitude of different ideas, trends and perceptions. Emergence is the second phase where companies are trying to make sense of which

trends that are relevant. Convergence is the third phase where companies decide on methods of action.

According to Kononiuk and Sacio-Szmanska (2015) there are three major steps of the foresight process. The first step is *collection of information*, which is the usage of different sources to scan and gather data in order to identify trends. The second step is *interpretation*, which is translating the data into threats and opportunities and then integrating these with the firm's strategy. The third step is *utilization*, which is acting upon the identified opportunities and threats.

Will (2008) mentions five steps for corporate foresight according to the following:

1. *Scoping* - to know where to get information, for example defining what industries to examine or technologies.
2. *Gathering information* - to actually gather the information from the scoping stage.
3. *Scenarios* - to plan multiple future scenarios in order to be prepared regardless of what the actual scenario will be in the future.
4. *Backcasting* - is to imagine one future and to track "backwards" in time in order to understand how to get to that specific future scenario.
5. *Transfer of information* - to take the insights of what was retrieved in the previous steps and push it out in the organization to different departments in order to act on it.

Sarpong et al. (2013) use a framework in that they suggest four steps:

1. *Prospective sense-making* – a problem-driven search where the goal is to gather relevant trends for the organization.
2. *Multilateral participation* – when considering potential alternatives and competing future pathways of the organization.
3. *Application of analytical foresight techniques* – to creatively explore and evaluate different alternatives regarding the future and limit the number of alternatives in order to track possibilities.
4. *Cooperation and practical judgement* – involves negotiating and selecting among the alternative paths into the future.

A research by Hammoud and Nash (2014) uses five steps of corporate foresight:

1. *Guiding questions* – the process of identifying specific concerns that are relevant to the industry or department that is involved in the foresight activity.
2. *External environment* – internal and external scanning, where the focus lies on picking up early indicators of change and to develop general trends.
3. *Anticipating change* – how observations create meanings, which means how to translate the gathered information from the scanning process into insights that will create value for the company.
4. *Scenarios and stories of future* – here the company agrees on a few preferred future states that are in line with their common vision.
5. *Shaping the future* – here the scenarios and preferred futures that were constructed before are turned into action plans on the possible opportunities or threats that were identified in the foresight process.

All six approaches on corporate foresight above are mapped in Figure 2, where an attempt is made to fit each scholar's approach in three steps of the corporate foresight process, where the aim is to show the similarities with all scholars' approaches

compared to Højland's and Rohrbeck's (2017) approach of perceiving, prospecting and probing.

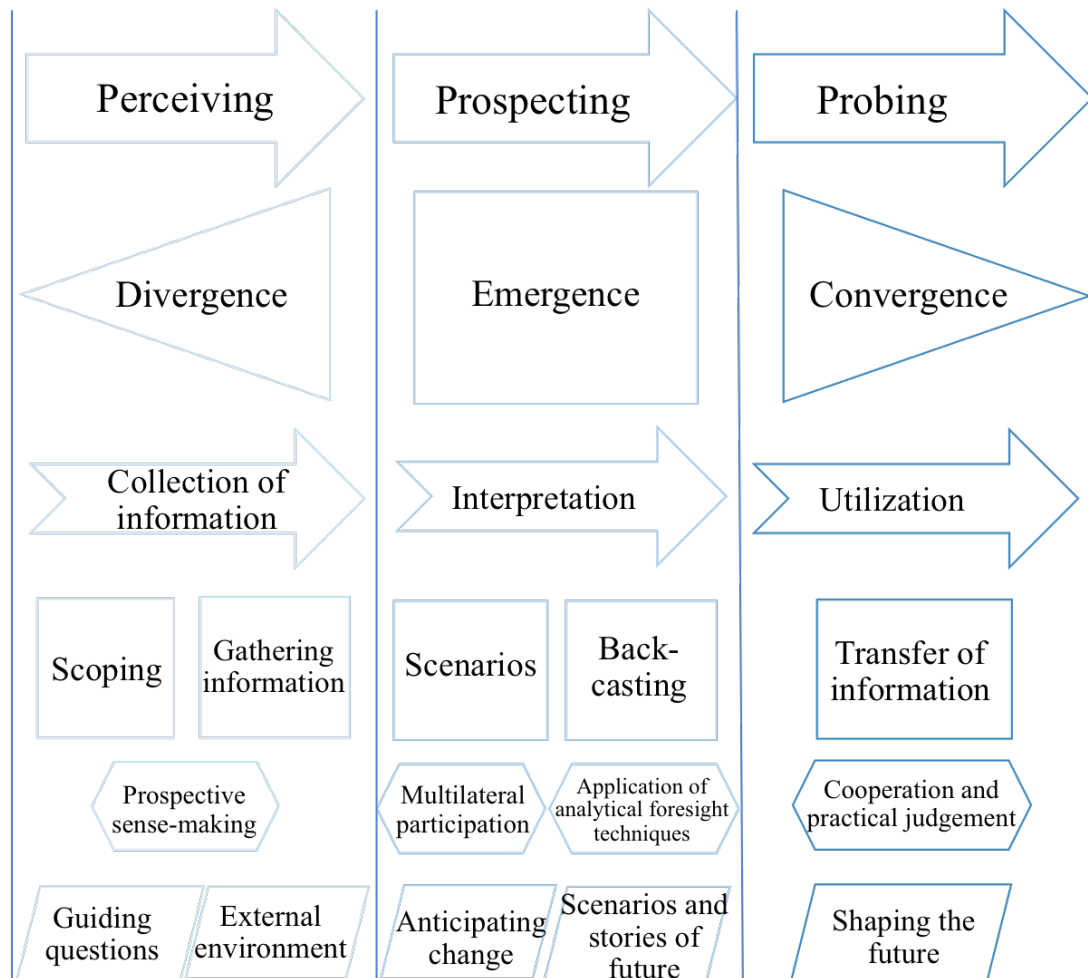


Figure 2 – Corporate foresight methods compared to each other

When comparing Højland and Rohrbeck (2017) with Ratcliffe (2006), clear similarities can be seen between *perceiving* and *divergence*, *prospecting* and *emergence* and finally *probing* and *convergence*, in accordance with the descriptions of each approach above. In the comparison of Kononiuk and Sacio-Szmanska (2015) with Højland and Rohrbeck (2017), *collection of information* matches *perceiving*, *interpretation* matches *prospecting* and *utilization* matches *probing*. Further on, when comparing Will's (2008) and Højland's and Rohrbeck's (2017) methods for corporate foresight it can be clearly seen that *scoping* and *gathering information* can be seen as a part of the *perceiving process*, *scenarios* and *backcasting* are types of *prospecting*, and *transfer of information* is equal to *probing*. Moving on to the comparison between Sarpong et al. (2013) and Højland and Rohrbeck (2017), *prospective sense-making* is described similar to *perceiving*, *multilateral participation* and *application of analytical foresight techniques* can be summarized as *prospecting*, and finally *cooperation and practical judgement* is in line with *probing*. Lastly, Hammoud and Nash (2014) and Højland and Rohrbeck (2017) are similar since *guiding questions* and *external environment* are comparable with *perceiving*, *anticipating change* and *scenarios and stories of future* are the *prospecting* part, and finally *shaping the future* matches *probing*.

In summary, there are different names on similar approaches for corporate foresight. As argued in this section, there is a strong support for corporate foresight to at least be divided in three distinct phases. The conclusion is that it is possible to measure a firm's maturity of corporate foresight by measuring the proficiency in each of the three dimensions of the corporate foresight process. In order to avoid confusion, and for the sake of simplicity, the definition by Højland and Rohrbeck (2017) of *perceiving*, *prospecting* and *probing* will be used for this thesis.

2.2.6. Impact of corporate foresight

Rohrbeck (2011) states that a company's ability to identify, prepare for and respond to change is what determines the survival of that company. Day and Schoemaker (2005) conclude that there are large benefits for companies that manage to successfully make use of corporate foresight. Hines (2003) and Ratcliffe (2006) suggest that the key to success for a given business is a strong foresight capability connected with a future orientation, all being based on adaptable systems. Further on, as Rohrbeck (2011) concludes, from a resource-based perspective it is possible to view corporate foresight as a resource yielding a competitive advantage.

Rohrbeck (2012) identifies three main value contribution areas for corporate foresight. Firstly, a successful foresight practice improves a company's ability to trigger responses. Secondly, it facilitates strategic discussions in order to embrace change and thirdly, it identifies the need for the acquisition of future strategic resources (Rohrbeck, 2012). Other benefits of a strong use of corporate foresight is that corporations are often slow-moving entities that need a lot of time to act on any information given. Use of good foresight activities gives more time for a company to act upon the findings of the foresight activities (Hammoud and Nash, 2014).

There are several studies linked to the explicit impact of having a strong foresight practice. One of the largest ones was a benchmark study made by Rohrbeck and Kum (2017) in 2008 and 2015, representing one business cycle, with a sample of large European companies. The same companies were studied in 2008 and 2015 in order to investigate how corporate foresight impacted their profitability and valuation growth. It was concluded that firms with a higher level of maturity with regards to corporate foresight had larger profit growth as well as a larger increase in market capitalization.

Figure 3 shows that for all firms, regardless of their future preparedness when it comes to corporate foresight, averagely increased their profit with 16% between 2008 and 2015. Companies that were categorized as *prepared* in the benchmark studies, meaning that they had a high maturity of corporate foresight, had a mean increase in profit of 19% (Rohrbeck and Kum, 2017).

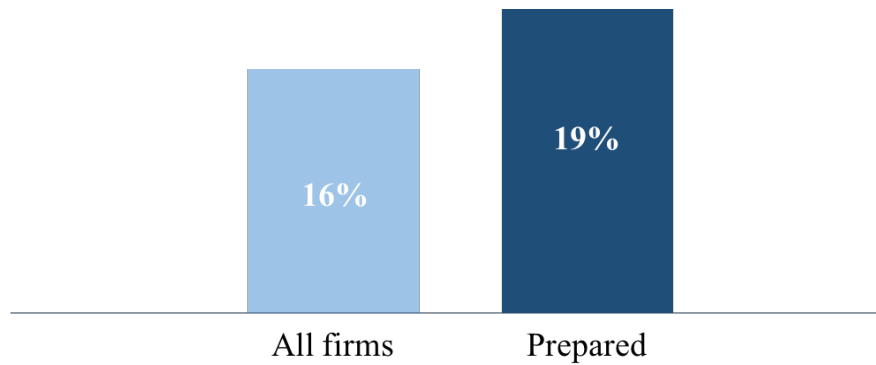


Figure 3 – Profitability growth between 2008 and 2015 (Rohrbeck and Kum, 2017)

Figure 4 shows that the valuation growth for all firms, regardless of their future preparedness when it comes to corporate foresight, had a mean increase in valuation growth of 50% between 2008 and 2015, while companies that were categorized as prepared in the study had an average increase in valuation growth of 93%.

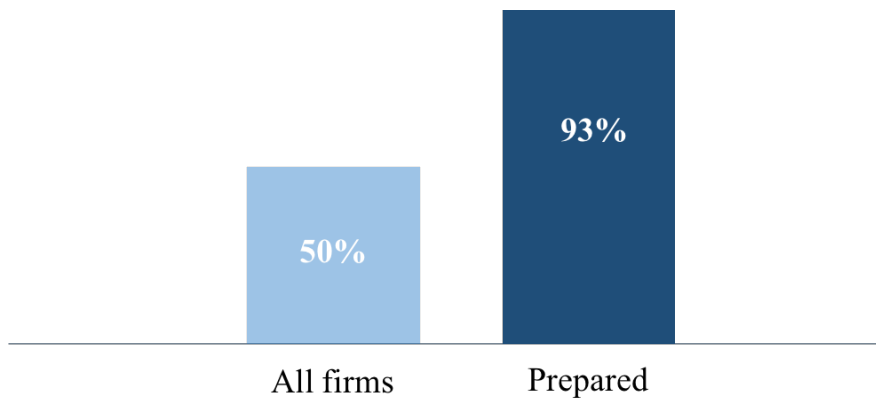


Figure 4 – Valuation growth between 2008 and 2015 (Rohrbeck and Kum, 2017)

There are multiple evidence cases that imply that corporate foresight activities have led a firm towards a more prosperous future (Heger and Rohrbeck, 2012). Corporate foresight is said to be a success if it makes the organization more able to learn, to be more creative regarding strategy and initiatives and if it makes the implementation of these strategies more efficient and effective (Bezold, 2010). Rohrbeck (2012) argues that corporate foresight has strong value contributing properties and that corporate foresight activities are a sensible investment that may yield positive results. Vecchiato (2015) argues that especially in more turbulent environments, firms that are proficient in their foresight activities tend to have easier preventing new hostile market entries by using pre-emptive methods to make these entries less profitable. Vecchiato (2015) also stresses the importance that when working with corporate foresight, organizations tend to foster a ‘planned learning’ about the future. This implies that the value creation is not merely about different future outlooks, but also creates value in improving a company’s learning ability.

Most companies follow a form of path dependence for their technology or products (Geels, 2002). Corporate foresight activities enable a company to break free from this path dependency and gain a competitive advantage (Rohrbeck, 2012). Lastly, Corporate foresight has the possibility of positively impacting long-term strategy and innovation processes in a company (Daheim and Uerz, 2008).

2.2.7. Challenges of corporate foresight

There are also examples of when neglecting corporate foresight leads to negative results. Hammoud and Nash (2014) give the example of a company whose foresight unit found a new technology together with a start-up. This new technology had the possibility to challenge the products of one of their business lines. The executive management brushed the threat aside, but they failed to stay informed of the progress of the technology direction and the start-up itself. This resulted in that the new technology led to severe decrease of that business unit's sales, resulting in layoffs for the neglecting company (Hammoud and Nash, 2014).

Some scholars recommend companies to have a separate foresight unit (Rohrbeck, 2011; Rohrbeck et al., 2015; Ruff, 2015). Some firms have a special dedicated foresight unit that works across all functions with foresight-related questions, while others have the foresight activities embedded in the original, but separate, business areas and functions (Vecchiato and Roveda, 2010). Rohrbeck (2011) found that a large amount of corporate foresight activities is not done in an overarching function, but instead each separate business unit manages its own foresight process. Since foresight is cross-sectional, and not limited to only a certain business unit, it is crucial that the foresight unit works across all levels of the company (Ruff, 2015).

Ruff (2015) argues that one of the difficulties with having a foresight unit is that the unit must deliver results that are complementary, but at the same time unique from the rest of the organization's functions, for example strategy, marketing and product development. The unit needs to continuously prove that it adds value distinct from the rest of the firm, and that the insights created have a longer perspective from the rest of the firm's strategic units (Ruff, 2015). In conclusion, the foresight team needs to be open to different inputs and changing organizational environments. Thus, the foresight team needs to be open to a diverse range of information coming from both the outside and the inside of a company (Ruff, 2015).

Another challenge with corporate foresight is that corporate foresight requires long time horizons, often beyond 10 years, and needs a broad view of the business environment and the organization itself. However, most firms often fail to grasp more than a few different sets of narrow factors (Bezold, 2010). Often foresight is neglected due to a perceived lack of time, a perceived lack of interest from top management or a doubt about its effectiveness (Bezold, 2010). In turbulent times of discontinuous change, many companies find it difficult to adapt their business model and products to ensure survival in the new environment (Stubbart and Knight, 2006; De Geus, 1997). Lastly, another time-related consequence when conducting foresight analysis is that quantitative projections based on historical data tend to be inaccurate and unreliable due to the rapidly shifting business environment (Hammoud and Nash 2014), especially in industries with a fast-technological pace.

2.3. Uniqueness of Swedish companies

In order to answer the research questions of if there are any differences between large Swedish companies compared to large European companies when it comes to need, capabilities and maturity of corporate foresight, and how and why they are different, it is relevant to first learn more about what makes Swedish companies unique.

To fully understand the corporate culture in Sweden, it is important to know a few historical facts. Some researchers argue that the Swedish tradition of consensus in

groups has a long tradition going all back to the age of Viking *tings*. A *ting* was a juridical court in which perpetrators of a crime were judged. The uniqueness of the *ting* was that the verdict delivered by the court was taken not by one single individual, but a group of peers. It is from this tradition that the American jury system has its roots. This led to consensus early being a part of the Swedish culture (Olsson, 2016).

Another impact regarding the Swedish approach to authority can be found during the middle ages. Some researches argue that since there was not a strict feudal society in Sweden, as was the case in France for example, there was no strong authority to obey in everyday situations. This led to the average farmer having a strong decision power in his or her own life, and that decisions continued to be based around consensus (Myrdal and Morell, 2011).

There is also of interest to study the evolution of Sweden as a modern welfare state. This vision was called *Folkhemmet*, translated to *People's home*. It was anticipated near 1930 by the Social Democratic party, who was the ruling political party for more than four decades after that time. *Folkhemmet* is a metaphor of a good society where *equality, concern for others, cooperation and helpfulness* are keywords (Chhokar et al., 2008). The politicians of that time developed an approach called *the Swedish model*, which means that salaries and security on the labor market is handled through negotiations between the labor unions and employers (LO, 2017). Sweden's development as a welfare state was therefore due to the Swedish model as well as the mix-economy, labor unions and employers, which have led Swedish work culture being influenced with high employment-security and sustainable working hours (Chhokar et al., 2008).

According to Hofstede (1980), Swedish culture is characterized by a high amount of individualistic attitude instead of collectivistic. Whilst this might first sound contradictory, the implication of this is that Sweden has moved away from a clan-based society where the collective matters a lot, to a society more centered around the individual (Hofstede, 1980). Further on, there is a high valuation of aspects such as modesty and concordance instead of ambition and competition. Another study done by Massey and Lynn (1992) gives Sweden a low score on *competitiveness* and *valuation of money*. Moreover, Egan (1997) conducted a study between multiple European business cultures and styles of management and found several unique aspects about Swedish business culture and Swedish managers. One is that due to the managerial style of Sweden with a high degree of participation, this promotes good interdepartmental relations as well as successful implementation of new policies. Another is due to the high emphasis on teamwork, Swedish organizations tend to be decentralized and flat, where subunits often have the possibility to make an impact (Egan, 1997). Finally, due to the importance of technology in Swedish companies, organizations tend to focus on innovation, product design and manufacturing methods (Egan, 1997).

An analysis of 25 different cultures around the world called *Globe study* (Chhokar et al., 2008) summarizes multiple studies of different managerial cultures across the globe. In this collection of studies, there is a separate chapter of research done on Swedish culture done by Holmberg and Åkerblom (2008). They conclude that the defining characteristics for Swedish business culture are a high degree of equality, although there are not clear boundaries between different ranks. Following this, it is clear that Sweden has a high level of both internal and external contacts in a

company, since this is facilitated by the very culture itself (Holmberg and Åkerblom, 2008). Other characteristics are vagueness, equality and consensus.

Swedish leadership values tend to be somewhat similar to the rest of the world, however some aspects stand out. A leader who is autonomous, humane and a team integrator is seen as a positive manager in Sweden. This emphasizes the role of the team leader as a facilitator of teamwork, but not an authoritarian leader. Instead, the purpose of the leader is to facilitate for the group to succeed together leading to decentralized leadership and organizations (Holmberg and Åkerblom, 2008). Bad aspects of a manager can be found in the values procedural, conflict inducer and status conscious, which also points towards the Swedish society disregarding strong leaders that do not listen to the entire group. Sweden also scores high values for uncertainty avoidance, seeking instead to mitigate uncertainties by social structures, bureaucracy and rigid processes (Holmberg and Åkerblom, 2008).

In general, a high level of digitalization, but also openness to new markets defines Swedish businesses (European Commission, 2017). This is due to the fact that Sweden as a home market is rather small, expanding companies have targets set on abroad earlier than what would be the case if the Swedish market were larger. In general, the innovation rate is high among Swedish companies. In 2016 the business environment was classed as the most innovative in the European Union (European Commission, 2016) and the second most innovative in the world (Jamrisko and Lu, 2017). Furthermore, Swedish working hours are rather short, but productivity per hour is high, giving further support to the high level of digitalization and the low authority demands in the workplace (OECD, 2017).

In summary, Swedish culture has a large impact on Swedish businesses, and it is reasonable to think that what sets a large Swedish MNC (Multinational company) apart from another MNC is not mainly its products, but instead its' "Swedishness".

2.4. Research hypothesis

Based on the literature found in the theoretical framework, the formulated research hypothesis for this thesis will be as follows:

H₁: There will be a difference on the capability level for corporate foresight in a Swedish setting. Especially with regards to the culture dimension.

3. Method

This chapter contains the chosen method for the thesis. A data collection and data analysis is done quantitatively through a peer-reviewed survey used for example in Rohrbeck and Kum (2017). Each dimensional score is calculated by a tool from Rohrbeck Heger GmbH.

3.1. Research design

The purpose with this thesis was to investigate the three dimensions of need, capability and maturity of corporate foresight between large Swedish and large European companies. Because of this purpose, the selected research design was a descriptive study, where a quantitative approach was used for data collection and data analysis. After extensive research, no articles have been found from other researchers using quantitative analysis in the area of corporate foresight before, and thus a contribution to the research field by using a quantitative approach will be made. Other reasons for choosing a quantitative approach will be explained in section 3.2.2.

3.2. Empirical data collection

The data collection process involves company selection for the Swedish sample, interviews and surveys, and lastly defining the European sample from the database given by the collaborator Rohrbeck Heger GmbH.

3.2.1. Company selection

In order to test if large Swedish companies differ from European ones with regards to corporate foresight activities, several criteria were used in order to determine this sample. Firstly, since the research questions specify *large* companies, a definition of *large* is needed. Using the approach set forward in the delimitations section 1.5 the criterion for large companies is established. Further on, there does not exist a clear definition of how to define whether a company is Swedish or not. Therefore, the assumption is made that a Swedish company is a company which has its headquarters located in Sweden, and where the company is registered at the Swedish Companies Registration Office (Bolagsverket).

Since the research questions are not limited to a certain industry, care had to be taken in order to not achieve a dramatic overrepresentation of a certain business area. Therefore, companies were selected in specific industries chosen to represent a sample from the Swedish industry in general. The industry representation for Sweden in terms of how much each industry contributes to Sweden's GDP is represented in Figure 5.

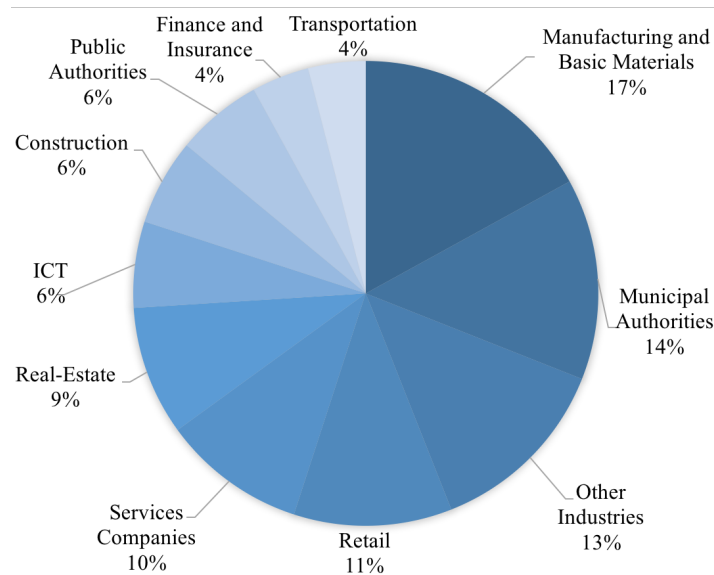


Figure 5 – Industries' contribution to GDP in Sweden (SCB, 2017)

In the data collection, the aim was to have an industry representation as close to Sweden's distribution of industries that contributes to Swedish GDP. The representation of the data collection is shown in Table 2, where each interview had a duration of 60 minutes.

COMPANY	INDUSTRY TYPE	DATE	FORM
A	Telecom	2017-03-10	Live interview
B	Metal and mining	2017-03-16	Live interview
C	Service company	2017-03-17	Live interview
D	Finance and insurance	2017-03-21	Live interview
E	Construction	2017-03-23	Live interview
F	Retail and consumer products	2017-03-24	Live interview
G	Media	2017-03-24	Live interview
H	Retail and consumer products	2017-03-27	Live interview
I	Basic materials	2017-03-27	Live interview
J	Transportation	2017-03-31	Live interview
K	Healthcare and pharmaceuticals	2017-04-03	Live interview

Table 2 – Primary data collection

As shown in Table 2, the Swedish sample group consists of 11 large Swedish companies. All companies have at least 500 employees and at least €500 million in revenue. They all have their headquarters in Sweden and are registered at the Swedish Companies Registration Office. Therefore, the criteria that was set when searching for large Swedish companies is fulfilled. Some industries are not represented in this dataset such as *public authorities*, *municipal authorities* and *real-estate*, which stands for 29% of Sweden's GDP. In other words, this sample gives a representation of 71% of Swedish GDP, which is believed to give a fair representation of Sweden's work with corporate foresight. However, as discussed by Rohrbeck et al. (2015), the work done by public sector and governmental agencies are different enough to be separated in an own research field (strategic foresight), and thus these companies within the sectors public authorities and municipal authorities, representing 20% of Sweden's GDP is omitted. In conclusion, this sample thus covers the absolute majority, or 91%

of Sweden's non-public sector's GDP. It can thus be argued that the sample is representative of Sweden's commercial economy as a whole.

3.2.2. Survey

For the purpose of having a clean dataset that is easy to compare between respondents, the choice of using a survey for this thesis was used. When designing a survey one must be careful about how the questions are worded, what kind of responses are possible, for example binary, ordinal, open-ended et cetera. Also, one has to be highly competent in the research area to be able to ask precisely the right questions (Collis and Hussey, 2003).

Since this thesis was conducted in collaboration with the consultancy firm Rohrbeck Heger GmbH, it was possible to use Prof. René Rohrbeck's survey that he developed for measuring future preparedness, which can be found in appendix in section 8.1. As mentioned before, this survey was also used by Rohrbeck and Kum (2017) among others.

The survey is divided in two parts, where all questions are multiple-choice questions with scale 1 to 7. The construction of the survey with a 7-point Likert scale implies that the data will be of ordinal type. Ordinal type data works well with quantitative methods, especially regression and test of different means. The first part of the survey captures the external factors a company faces, in other words *environmental factors*. In the survey these environmental factors are divided in three categories:

- *Environmental dynamism* – focuses on grasping topics on market growth, growth opportunities, and behavior of key competitors, customer and channel power et cetera.
- *Environmental complexity* – here the complexity of the environment is captured, where topics regarding industry structure, supply chain structure, regulations dependence on global economy et cetera are raised in order to understand the company's level of complexity in the environment they are acting.
- *Environmental hostility* – answers the aggressiveness of the environment. For example, the industry riskiness, industry generosity and environmental dominance.

To recall, above three environmental factors were found in the theoretical framework as well in section 2.2.3. Moreover, in order to analyze how a company works with corporate foresight, it is necessary to gather data regarding the company's *need* of corporate foresight. This was done in the environmental part of the survey described above. The other part of the survey measures both the *internal capabilities* and the *maturity* of corporate foresight in the company. The internal capabilities were also established in the theoretical framework in section 2.2.4; information usage, method sophistication, culture, people & networks and organization. The maturity of corporate foresight was mapped in the theoretical framework as well in section 2.2.5; perceiving, prospecting and probing.

This method for measuring corporate foresight is called the *maturity model* (Rohrbeck, 2011). An illustration of the maturity model is presented in Figure 6.



Figure 6 – The maturity model, Rohrbeck Heger GmbH

In summary, one needs to measure a company’s need and capabilities to be able to measure the company’s maturity.

3.2.3. Interviews

Since this thesis is about studying corporate foresight, it was central to interview a company representative from top management who works with strategic questions. At almost all companies, the interviews were conducted with the Chief Strategy Officer (CSO) of the company, who is believed to have the best knowledge regarding their company’s strategy and corporate foresight activities. At two of the 11 companies, the interviews were made with someone just below the CSO who was responsible for their company’s strategic work. 9 interviews were held in person at the company’s headquarters and two interviews were telephone interviews. A table of the interviews can be viewed in Table 2.

At the interviews, the survey was filled in together with the respondent. The authors of this thesis chose to be present and meet with the company when possible, since it is important that the survey was filled in correctly to minimize mistakes and missing data. Furthermore, the interviews were not audio recorded. This is mainly due to two reasons; firstly, since the data was collected quantitatively, where the survey consisted of multiple-choice questions, the only data analyzed was based on the survey answers. Being present at all interviews made it possible to be able to clarify any uncertainties about the questions, thus each respondent could fill in the survey correctly. Secondly, the interviews were not audio-recorded since each company’s strategic work often is strictly classified. However, since the answers of interest were the answers given in the survey, this was not considered as a loss.

In addition, six of the interviewed companies were revisited for a presentation of their individual results from the survey. This was an opportunity to double check the answers and confirm again with each respondent if their answers were understood in a correct manner. This step further validates the survey answers and adds an extra layer of validation to the data collection method.

3.2.4. Database search and peer group

The data from the large European companies were acquired from the database of Rohrbeck Heger GmbH, which implies the data to be secondary data. This adds a certain aspect of uncertainty, since there was no external way to validate this data. However, since Rohrbeck Heger GmbH themselves used the survey for all respondents in the database, and the database seemed in good order, no reason to distrust it was found. The companies in the database have responded to the same survey that is used in this thesis, which makes the data compatible. In addition, all companies in the database follow the criteria when defining large companies.

The database contained survey answers from 330 companies between 2008 until 2016, where the data was registered in chunks for the years 2008, 2013, 2015 and 2016. Since the purpose is to investigate the differences between Swedish companies and European companies, all Swedish companies that were already in the database were removed. The choice to only use data from 2013 and onward in the peer group was made. This decision was based on the benchmark study made by Rohrbeck and Kum (2017), where companies improved their corporate foresight abilities significantly between 2008 and 2015. That is, to increase the validity of the analysis, the choice was made to only compare the Swedish sample with data from 2013 to 2016. This narrows down the peer group size to 214 companies, where the Swedish companies in the database are not included in the group. In addition, companies in the database were found from outside of Europe. These were also removed since the peer group was supposed to consist of European companies. Therefore, the final number of companies in the peer group was counted to 174. However, the data for *environmental hostility* only counted up to 56 companies and the *probing* data to 50 companies, so there might be a risk to not be able to draw any conclusions for these two categories, since there will be fewer data points when comparing the Swedish group in these two specific sections.

As mentioned in section 1.5, the European sample consists of Western European countries. All Western European countries according to the World Bank's (2017) definition are represented in the peer group sample except from Sweden, Greece, Luxembourg, Iceland and Portugal. Sweden is not included because the Swedish companies in the database were removed in order to compare the Swedish sample group consisting of only Swedish companies with the rest of Western Europe. The other countries not represented in the database are not included simply because there are no data collected from companies in those countries. Overall, the majority of Western Europe is captured in the peer group, which is a good representation of Western Europe. In Figure 7, an illustration of Western European countries that are included in the database are presented, in order for the reader to get an overview of what parts of Europe that will represent the peer group.

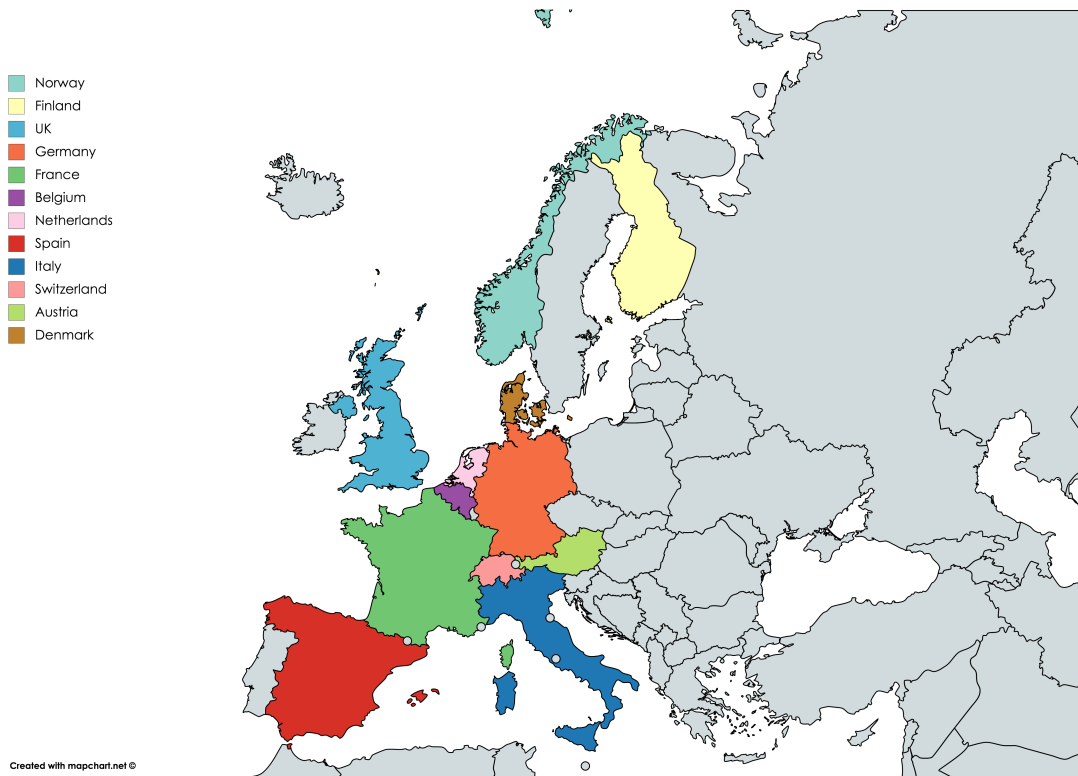


Figure 7 – Western European countries represented in the European peer group

The country distribution in the peer group is according to Figure 8 below. As seen in Figure 7, over 60% of the data comes from Germany and Denmark, which gives a bit skewed representation of Western Europe, and the perfect scenario would be to have a more equal distribution of countries in the peer group. However, it is believed that this data will still be a fair representation of Western Europe, and can reveal how Sweden is different from the rest of Western Europe.

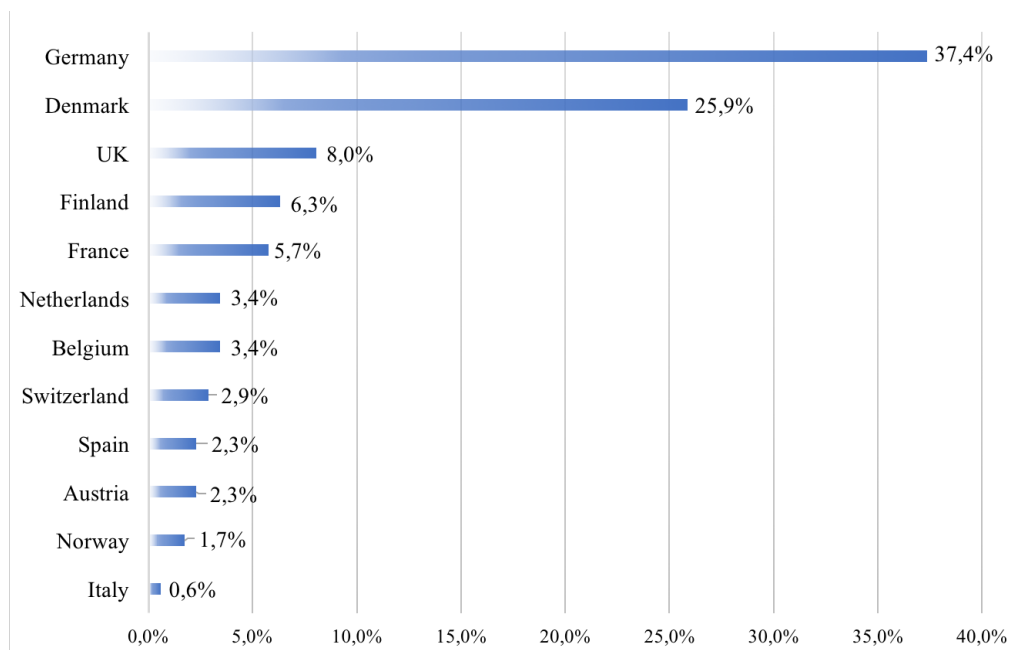


Figure 8 – Country distribution in peer group

When it comes to the industry distribution in the peer group, it should preferably be a fair representation of Western Europe’s GDP contribution. A good approximation would be to see the how much each industry sector contributes to EU’s GDP according to Eurostat (2012). In 2011, the distribution among the different industries was described as shown in Figure 9.

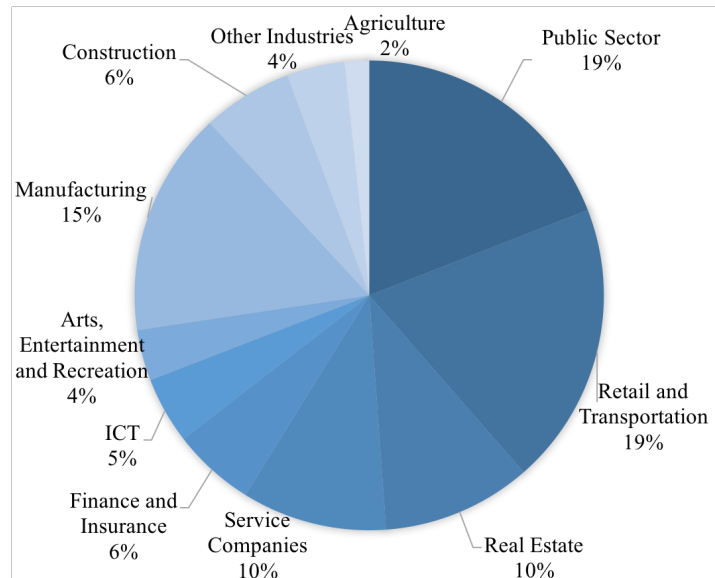


Figure 9 – Contribution to GDP in EU by industry sector (Eurostat, 2012)

In the peer group, the industry distribution is according to Figure 10. All industries are covered except for *construction, agriculture, public sector, arts, entertainment and recreations, real estate and service companies*. These add up to 51% of total GDP contribution in EU. However, the public sector consists of 19%, and as argued in section 3.2.1, the public sector can be ignored when measuring corporate foresight. The “other industries” sector in Figure 10 consists of the industries *automotive, chemicals, energy and utilities and healthcare and pharmaceuticals*. Overall, about 70% of EU’s GDP is represented in the peer group, which is believed to be decent enough.

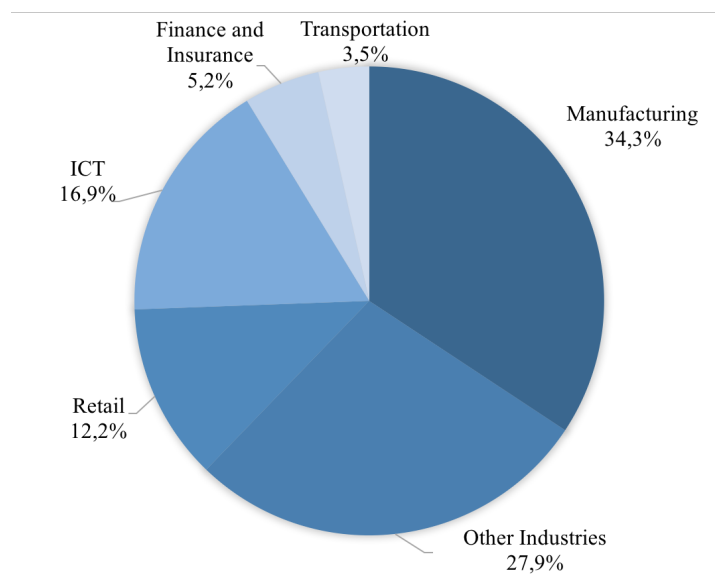


Figure 10 – Industry distribution in peer group

Finally, when comparing the distribution in the peer group with the Swedish sample, it is seen that the distribution of the European companies roughly resembles the distributions for the Swedish companies, and therefore the two sample groups can be compared.

3.2.5. Literature review

A literature review is used to gain knowledge on corporate foresight, Swedish corporate culture, corporate strategy and topics related to these. The literature review will be used together with the survey results to be able to answer the research questions. The literature review included multiple kinds of sources ranging from books to reports to journal articles. These were found using KTH Library search Primo, the Royal National library search LIBRIS as well as Google Scholar. Key search words when searching for literature were:

Corporate foresight, Strategic Foresight, Foresight Sweden, Foresight Europe, Corporate climate Sweden, Corporate climate Europe, Corporate culture Sweden, Corporate culture Europe, Corporate strategy, Business strategy, Strategic thought, Organizational culture, and Change management.

3.3. Data analysis

The data gathered through the survey responses were compiled and compared with the sample for European companies. The compilation was made by calculating numerical scores for each dimension from the respective answers in the survey. This was done by using an analytical tool provided by Rohrbeck Heger GmbH, which is a classified method of aggregating the survey questions to each dimension in the survey. Moreover, to determine if there is a difference between the responses from the Swedish sample and the peer group sample, the choice to analyze the sample groups using a quantitative approach was made. It would theoretically be possible to do the assessment through a qualitative analysis, however, due to the 7-point Likert scale of the survey used, a quantitative method was chosen instead.

There exist a multitude of different methods for analyzing quantitative data, but since the purpose is to examine differences in two different populations, a test that is constructed for that purpose will be used. In statistical analysis, one start with a null hypothesis H_0 and either reject it or fail to reject it using statistical data (Montgomery et al., 2012). It is crucial to understand that the *test hypothesis* used in the statistical tests are fundamentally different from the *research hypothesis* established earlier in the thesis from the theoretical framework. By usage of the test hypothesis, the hope is to be able to better answer the research hypothesis. In this case, the selected test hypothesis H_0 is:

H_0 : *There is no difference between large European and large Swedish companies.*

Since the null hypothesis will be tested for each dimension of the survey, H_0 must be stated in a general fashion. If the null hypothesis H_0 gets rejected, the conclusion can be made that there *is* statistical support for a difference between the populations (Montgomery et al., 2012).

The selected statistical tests used are known as a *Mann-Whitney U-test* and *Welch's t-test*. The purpose of using two different tests is to examine if the same results can be achieved from both tests, in order to increase the validity of the analysis. The software

programs used were Excel, VBA and MATLAB in order to construct the statistical tests needed. Excel and VBA were used for the Mann-Whitney U-test and MATLAB was used for Welch's t-test.

3.3.1. Mann-Whitney U-test

The Mann-Whitney U-test is a non-parametric test, which compares two samples by their rank (Corder and Foreman, 2011). This means that it is not necessary that the data has a specific parametric distribution to be able to use it. The test is also called *Wilcoxon's rank-sum test* and *U-test* (Lang, 2014). The Mann-Whitney U-test is actually the *Kruskal-Wallis H-test* but with the name Mann-Whitney U-test since there are only two sample groups, in other words the test is called Kruskal-Wallis H-test when there are more than two sample groups (Corder and Foreman, 2011; Lang, 2014). In this thesis, only two sample groups are used, and therefore only the description of how to conduct a Mann-Whitney U-test will be explained.

The algorithm of conducting a Mann-Whitney U-test is as follows (Mann and Whitney, 1947):

- Sort the sample groups together in one group and rank the data. This means that the smallest value in the whole dataset receives rank 1, the second to smallest value is ranked as 2 et cetera. The sum of the ranks equals to:

$$\frac{N(N + 1)}{2}$$

where N is the total number of data points.

- After the data has been sorted and ranked, separate the dataset in the two groups that will be compared. In this case the own gathered data on Swedish companies is separated from the rest of the data, which is the European dataset.
- Construct the two U variables U_1 and U_2 . U_1 is obtained by:

$$U_1 = R_1 - \frac{n_1(n_1 + 1)}{2}$$

where n_1 is the sample size for sample 1 and R_1 is the sum of the ranks in sample 1. U_2 is obtained by:

$$U_2 = R_2 - \frac{n_2(n_2 + 1)}{2}$$

where n_2 is the sample size for sample 2 and R_2 is the sum of the ranks in sample 2. N is known as:

$$N = n_1 + n_2.$$

- Now, sum U_1 and U_2 according to the following:

$$U_1 + U_2 = R_1 - \frac{n_1(n_1 + 1)}{2} + R_2 - \frac{n_2(n_2 + 1)}{2}$$

where it is known that the sum of the ranks, R_1 and R_2 is equal to $N(N+1)/2$ and that $N = n_1 + n_2$. This gives the equation:

$$U_1 + U_2 = n_1 n_2.$$

- From this, it is possible to find the mean μ and standard deviation σ of U as:

$$\mu = \frac{n_1 n_2}{2}, \sigma = \sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}.$$

If there are ties in ranks, meaning that several data points share the same rank, the standard deviation is calculated as follows:

$$\sigma_{corr} = \sqrt{\frac{n_1 n_2}{12} \left((n + 1) - \sum_{i=1}^k \frac{t_i^3 - t_i}{n(n-1)} \right)}$$

where $n = n_1 + n_2$, t_i is the number of subjects that shares rank i and k is the number of different ranks.

- Note that for large samples, U is approximately normally distributed according to the *central limit theorem*, which states that for the random variable X_i , where $i = 1, \dots, n$ with mean μ and standard deviation σ it holds for $Y_n = X_1 + \dots + X_n$ that

$$P\left(\frac{Y_n - n\mu}{\sigma\sqrt{n}} \leq b\right) \rightarrow \Phi(b), \text{ if } n \rightarrow \infty$$

where $\Phi(b)$ is the standard normal distribution $N(0,1)$, meaning that $\mu=0$ and $\sigma=1$ (Blom et al., 2005).

For the Mann-Whitney U-test there is no upper or lower limit of how many data points that is necessary in order to conduct the test (Mann and Whitney, 1947; Lang, 2014). In this case, the Swedish sample consists of 11 data points and the European sample consists of 174 data points.

3.3.2. Welch's t-test

The two-sample t-test or *Welch's t-test for unequal variances* is a parametric test designed for finding differences in means between two populations with unknown or unequal variances (Welch, 1947). The main difference between this test and the test known as *Student's t-test* is that there are no underlying assumptions that both the test distribution and the peer distribution must have identical variances. Also, the number of data points for the tested variables and the reference variables do not have to be the same (Welch, 1947).

There are some key assumptions to this test. Most importantly, there is the assumption that the underlying distributions come from an approximate normal distribution (Welch, 1947). This implies that the tested distributions have to be approximately normal in order for the test to be efficient (Ruxton, 2006). There is no lower bound on how many data points that are needed for the test, however, in order for the normality assumptions to hold for the peer distribution, at least 30 data points is recommended for the peer group (Ruxton, 2006).

The test uses a t-statistic computed as follows (Ruxton, 2006):

$$t = \frac{\mu_1 - \mu_2}{\sqrt{\frac{s_1^2}{n_1} - \frac{s_2^2}{n_2}}}$$

Here, μ_1 and μ_2 are the sample means from the test data and the reference data respectively, s_1 and s_2 are their standard deviations and n_1 and n_2 are the amount of data points in each sample. This t-statistic is then compared to a t-distribution with a certain degree of freedom in order to determine the significance level (Ruxton, 2006).

The degrees of freedom are calculated as follows (Moser and Stevens, 1992):

$$v = \frac{\left(\frac{1}{n_1} + \frac{u}{n_2}\right)^2}{\frac{1}{n_1^2(n_1 - 1)} + \frac{u^2}{n_2^2(n_2 - 1)}}$$

where $u = \frac{s_2^2}{s_1^2}$.

The Welch's t-test performs significantly better than the ordinary student's t test with regards to reduction in Type I statistical errors, that is an incorrect rejection of a true null hypothesis, when the variances of the samples are unequal (Ruxton, 2006).

3.4. Quality of analysis

To ensure the quality of the analysis, a description is made below on the reliability, validity and generalizability.

3.4.1. Reliability

Reliability is the measure of the thesis' accuracy and precision, and also the lack of difference if the study was to be repeated by another researcher. In summary, if the same research is conducted using the same methods and the same data, which generates the same result, the study can be said to have high reliability (Collis and Hussey, 2003). The primary data gathering, which this thesis relies on is survey interviews with selected persons from selected companies. With respect to this, this study has low reliability, since not only are the respondents anonymous, the companies themselves are also anonymous, since information concerning company strategy is extremely sensitive. As such, this study is hard to replicate. Furthermore, the compilation from the survey questions to each respective dimension was made by using Rohrbeck Heger GmbH's analytical tool. Since this tool was only accessible through the collaboration, the only possible way to replicate the research exactly would be to also collaborate with them. Moreover, to the quantitative approach used for comparison between the Swedish and the European companies, a statistical reliance on the results will be retrieved, since this sample group will consist of 11 companies in comparison with a database with 174 companies. Although it will be hard to repeat this study because of the impossibility to know what companies that are in the samples, the belief is that if the next researcher repeats this research but uses other companies with the same industry distribution, the result should be similar because of the sample size and reliable data analysis methods.

3.4.2. Validity

Validity means if a study's results can be said to be an accurate measurement of what was being investigated (Collis and Hussey, 2003). In order to achieve as relevant data as possible, certain methods were used. The survey used in this thesis is peer-reviewed and developed by Prof. Rohrbeck during his dissertation. The survey has been used for research published in peer-reviewed journals and used by Rohrbeck Heger GmbH for all survey answers in their database of large European companies. Therefore, the validity of the survey has been proven to be very high. The survey was created in such way that all companies from different industries should be able to answer the multiple-choice questions. What has been witnessed during the interviews is that all companies were able to answer all questions, with exception from those companies that do not sell products and needed to leave the section regarding product innovation blank in the survey.

Furthermore, the authors of this thesis were involved during all interviews when the respondents filled in the survey. This increases the validity of the data collection, since there was a possibility for the respondents to ask questions regarding the survey questions or discuss a certain topic. Therefore, it is believed that the survey was filled in correctly and can be used for data analysis. However, the data collected for the Swedish sample was self-reported, and there was no other way to validate the data besides when revisiting six of the respondents to present their results. Furthermore, it cannot be validated how the data was collected in the database that was used as the peer group. Therefore, the validity of the data collection may be lower for the peer group, but since the peer group includes 174 survey answers, the validity is still acceptable.

3.4.3. Generalizability

Generalizability means to which degree a study can be applied to other cases as well (Collis and Hussey, 2003). In this case, since the thesis is done only for large Swedish companies compared to large European ones, there will for certain be a difference if choosing another country for comparison. Since the entire research hypothesis is that Swedish companies differ from European ones especially with regards to the cultural aspect, the results will only describe the difference between Swedish and European companies. If the next researcher chooses to compare for example Finnish companies with European ones the results may be different.

3.5. Ethics

When conducting a research project, one must consider the aspect of research ethics. The Swedish Research Council (Vetenskapsrådet, 2017) has created four main principles with regards to research ethics; *information*, *consent*, *confidentiality* and *good use*. This thesis has been made in compliance with those principles. The first code *information* was fulfilled since all interviews that were conducted were explicitly explained to the respondents. The person who was supposed to be interviewed and answer the survey was firstly informed by phone about the purpose of the thesis. This was complemented by a confirmatory email confirming the time and date, and containing an information brochure about the thesis. The second code *consent* was fulfilled since no respondent was forced to participate in the study, and the interviews were done on a voluntary basis. The third code *confidentiality* was fulfilled through assuring the company representatives that they, the company and the survey answers was confidential information and would be anonymous in this thesis. A promise was made to each company to not publish the data in a way that the reader

of the thesis can understand what company that is referred to in the thesis, only what industry it is about. Also, the results presented in the thesis are clustered and what is interesting is solely the differences between the two samples and not each company by itself. The fourth and last code *good use* was fulfilled since the authors of this thesis will not use the collected data for any other purpose than the purpose of this thesis.

The thesis was conducted in collaboration with the consulting firm Rohrbeck Heger GmbH. This fact was confirmed in writing, and as such, the information brochure sent out to the companies contained this fact stated explicitly. This brochure also contained information about the survey, the anonymity of both respondents and answers as well as the expected amount of time required for the survey.

4. Empirical results

In this chapter the results of the thesis are presented. First, an overview of the survey answers is illustrated. Then, the results from the two different quantitative methods are presented. Lastly, a summary of the quantitative results is presented. To remind the reader, European companies are in fact Western European companies.

4.1. Survey results

Before presenting the actual results, it is interesting to see how the different samples scored on the survey questions. As mentioned before, the Swedish sample consists of 11 companies and the European sample consists of 174 companies. From all survey answers for each company in each sample, an average of all answers were taken in each section, where the compiled survey answers are shown in Figure 11, Figure 12 and Figure 13.

In Figure 11, the need for corporate foresight is examined. As seen, Swedish firms score lower on environmental dynamism, higher on environmental complexity and higher on environmental hostility. The bar charts give the reader a descriptive, illustrational overview of how Swedish companies and European companies differ when answering the survey questions.

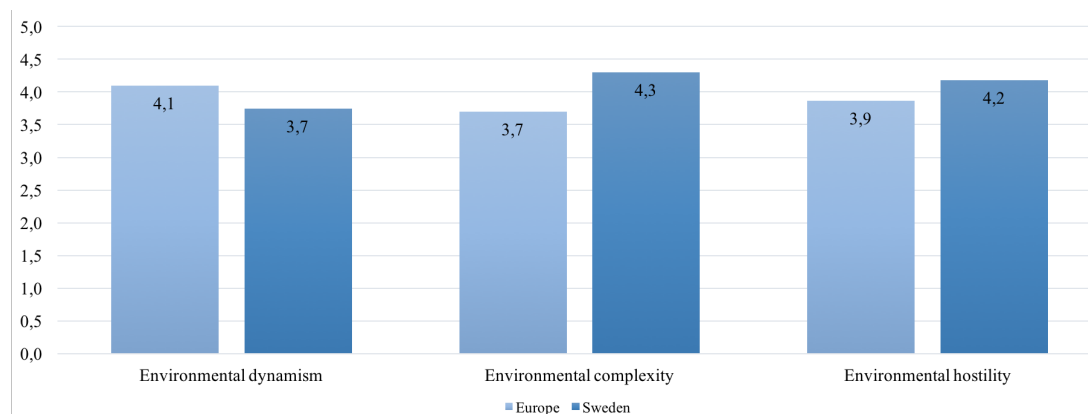


Figure 11 – Average survey answers for European and Swedish companies' environmental factors

In Figure 12, Swedish firms score higher on all internal capabilities. The largest difference in how European firms and Swedish firms score seems to be in information usage and culture.

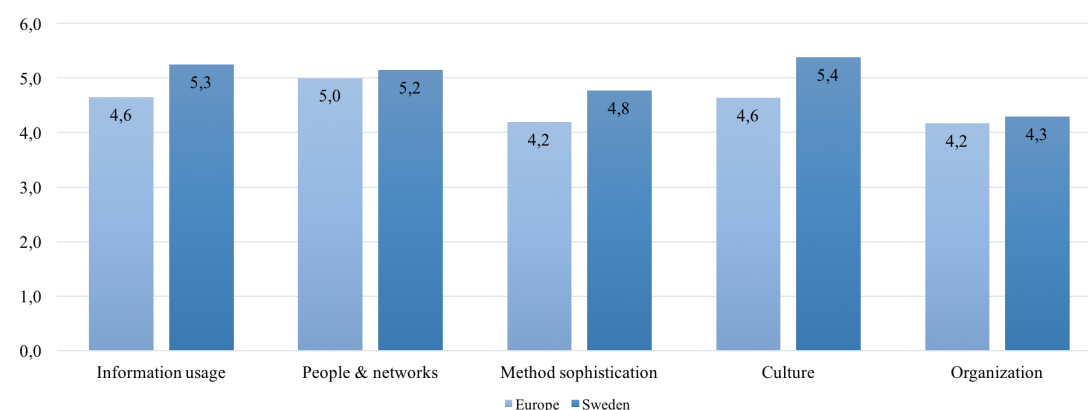


Figure 12 – Average survey answers for European and Swedish companies on internal capabilities

In Figure 13, with regards to corporate foresight maturity, Swedish firms score higher on perceiving, lower on prospecting and higher on probing. Among the European companies, a sinking linear trend from perceiving to probing is seen, while among the Swedish companies a slight U-shape is seen.

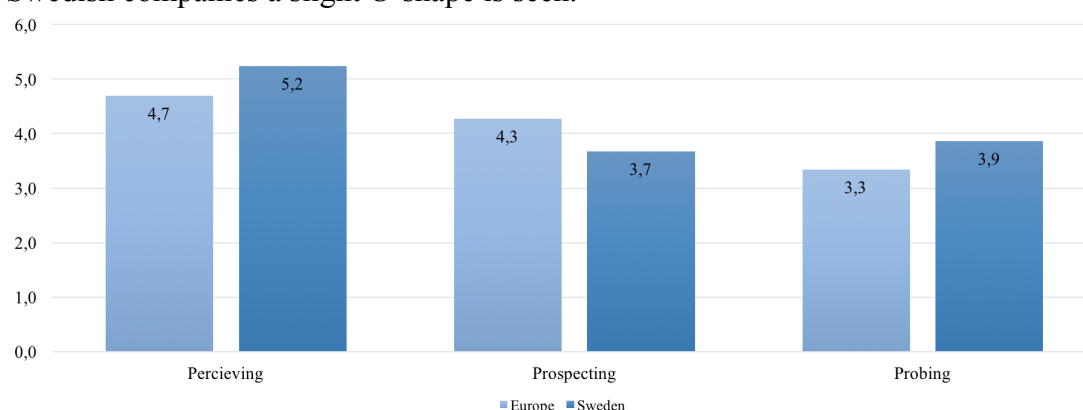


Figure 13 – Average survey answers for European and Swedish companies on corporate foresight maturity

4.2. Results from the Mann-Whitney U-test

Below the results from using the Mann-Whitney U-test are presented as three separate blocks; the environmental factors (need), internal capabilities and the corporate foresight maturity. To recap our test hypothesis (null hypothesis):

H_0 : *There is no difference between large European and large Swedish companies.*

H_0 was tested on each of the three main dimensions; environmental factors (need), internal capacities and foresight (maturity) and on each sub-dimension of these. As noted by earlier researchers, there is no strict consensus about what constitutes an acceptable confidence level in statistical tests (Cramér, 1955; Cowles and Davis, 1982). However, the p-value for each test will be stated in the results, giving the reader the opportunity to decide on what confidence level they find reasonable for this research. This thesis uses the following approach due to the data available; if it can be said that there is a difference between the sample groups with a confidence level of at least 90%, the null hypothesis is rejected and the conclusion is made that there is a difference between the samples. If a difference is seen in the samples but only with a confidence level below 90%, the rejection of the null hypothesis fails, and thus the conclusion is that it cannot be said that there is any difference between the groups.

4.2.1. Environmental factors - need

In Table 3 the results of the environmental factors are shown when comparing the two sample groups; Swedish firms and European firms. As shown, when it comes to environmental dynamism and environmental complexity, it is stated that there is a significant difference between Swedish and European firms, where Swedish firms have lower environmental dynamism and higher environmental complexity, which can be seen in Figure 11. When it comes to environmental hostility, it is stated that there is no significant difference between Swedish firms and European ones.

Environmental factors	Significant difference between groups	p-value	Confidence level	Interpretation of result
<i>Environmental dynamism</i>	Yes	0.0681	>90%	Swedish firms have lower environmental dynamism than European firms
<i>Environmental complexity</i>	Yes	0.0213	>95%	Swedish firms have higher complexity than European firms
<i>Environmental hostility</i>	No	0.1673	<90%	No significant difference between Swedish and European firms

Table 3 – Results from the Mann-Whitney U-test - Environmental factors

In conclusion, H_0 is rejected on environmental dynamism and environmental complexity, and H_0 fails to be rejected for environmental hostility. Thus, it cannot be said that there is any difference with regards to environmental hostility.

4.2.2. Internal capabilities

Table 4 shows the results of the internal capabilities when comparing the two sample groups Swedish firms and European ones. It is stated that there is a significant difference when comparing Swedish and European firms on information usage, method sophistication and culture. The test shows that Swedish companies have stronger information usage, stronger method sophistication and stronger and more suitable culture than European firms, which can be viewed in Figure 12. It is also stated that there is no significant difference between Swedish and European firms when it comes people & networks and organization.

Internal capabilities	Significant difference between groups	p-value	Confidence level	Interpretation of result
<i>Information usage</i>	Yes	0.0714	>90%	Swedish firms have stronger information usage than European firms
<i>People & networks</i>	No	0.3201	<90%	No significant difference between Swedish and European firms
<i>Method sophistication</i>	Yes	0.0998	>90%	Swedish firms have stronger method sophistication than European firms
<i>Culture</i>	Yes	0.0143	>95%	Swedish firms have stronger and more suitable culture than European firms
<i>Organization</i>	No	0.4354	<90%	No significant difference between Swedish and European firms

Table 4 – Results from the Mann-Whitney U-test - Internal capabilities

In conclusion, H_0 is rejected for information usage, method sophistication and culture, and H_0 fails to be rejected for people & networks and organization. Thus, it cannot be said that there are any differences in these two internal capabilities.

4.2.3. Corporate foresight - maturity

When it comes to the corporate foresight maturity, Table 5 shows the results of each of the three steps in corporate foresight between Swedish and European firms. It is stated that there is significant difference in prospecting, where Swedish firms have weaker prospecting ability than European firms as seen in Figure 13. It is also stated that there is no significant difference between Swedish and European firms when it comes to perceiving and probing.

Corporate foresight abilities	Significant difference between groups	p-value	Confidence level	Interpretation of result
<i>Perceiving</i>	No	0.1434	<90%	No significant difference between Swedish and European firms
<i>Prospecting</i>	Yes	0.0862	>90%	Swedish firms have weaker prospecting ability than European firms
<i>Probing</i>	No	0.1168	<90%	No significant difference between Swedish and European firms

Table 5 – Results from the Mann-Whitney U-test - Corporate foresight maturity

In conclusion, H_0 is rejected on prospecting and H_0 fails to be rejected on perceiving and probing. Thus, it cannot be said that there are any differences between Swedish and European firms when it comes to perceiving and probing.

4.3. Results from Welch's t-test

In order to conduct a Welch's t-test, the Swedish and European samples must approximately follow a normal distribution. One way of checking for this is to construct quantile-quantile plots (QQ plots), where the empirical sample (y axis) is plotted against a parametric distribution, in this case a normal distribution (x axis), which is shown in Figure 14 and Figure 15. To see if this sample follows a normal distribution, the blue dots should lay on or close to the red line (Hult et al., 2012).

The Swedish sample consists of 11 companies, and as can be seen in Figure 14 it approximately follows the red line, which indicates that the empirical sample approximately follows a normal distribution, and therefore permits the usage of Welch's t-test. In this particular figure, the *people & networks* data is plotted.

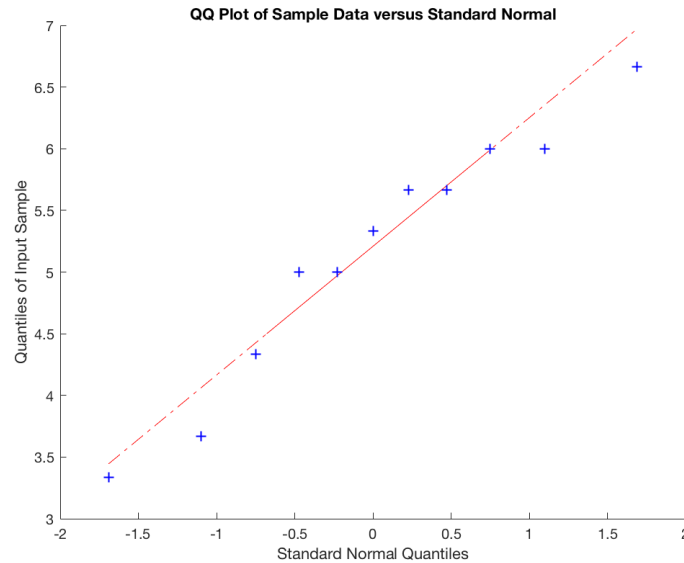


Figure 14 – QQ plot for the Swedish sample against a standard normal distribution, People & Networks

In Figure 15 the European sample consisting of 174 companies on the section *people & networks* is plotted as well. As seen in the figure, it almost follows the red line, and thus it is stated that the European sample approximately follows a normal distribution.

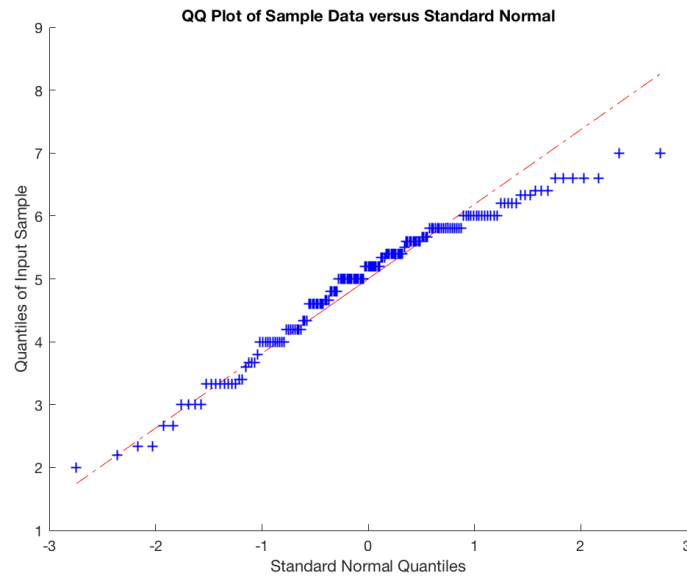


Figure 15 – QQ plot for the European sample against a standard normal distribution, People and Networks

Now that it has been shown that the samples approximately follow a normal distribution, Welch’s t-test will be constructed. The rest of the QQ plots for the other sub-dimensions can be viewed in appendix in section 8.2.

4.3.1. Environmental factors - need

In Table 6, the results for environmental dynamism, environmental complexity and environmental hostility can be viewed. Here, it is stated that there is a significant difference in environmental complexity, where Swedish companies have a higher environmental complexity than European ones, which can be seen in Figure 11. For

environmental dynamism and environmental hostility, it is stated that there is no significant difference between Swedish and European firms.

Environmental factors	Significant difference between groups	p-value	Confidence level	Interpretation of result
<i>Environmental dynamism</i>	No	0.1274	<90%	No significant difference between Swedish and European firms
<i>Environmental complexity</i>	Yes	0.0470	>95%	Swedish firms have higher environmental complexity than European firms
<i>Environmental hostility</i>	No	0.3355	<90%	No significant difference between Swedish and European firms

Table 6 – Results from the Welch’s t-test - Environmental factors

In conclusion, H_0 is rejected on environmental complexity, and H_0 fails to be rejected on environmental dynamism and environmental hostility, in other words it cannot be said that there are any differences between Swedish and European firms when it comes to dynamism and complexity.

4.3.2. Internal capabilities

Table 7 shows the results from the internal capabilities, where it is stated that there is a significant difference in method sophistication and culture. According to the test, Swedish firms have stronger methods for corporate foresight and stronger and more suitable culture than European ones, which can be viewed in Figure 12. It is also stated that there is no significant difference between Swedish and European firms when it comes to information usage, people & networks and organization.

Internal capabilities	Significant difference between groups	p-value	Confidence level	Interpretation of result
<i>Information usage</i>	No	0.1460	<90%	No significant difference between Swedish and European firms
<i>People & networks</i>	No	0.5939	<90%	No significant difference between Swedish and European firms
<i>Method sophistication</i>	Yes	0.0857	>90%	Swedish firms have stronger method sophistication than European firms
<i>Culture</i>	Yes	0.0340	>95%	Swedish firms have stronger and more suitable culture than European firms
<i>Organization</i>	No	0.7131	<90%	No significant difference between Swedish and European firms

Table 7 – Results from the Welch’s t-test – Internal capabilities

In conclusion, H_0 is rejected for method sophistication and culture, and H_0 fails to be rejected for information usage, people & networks and organization. Thus, it cannot be said that there are any differences for these three internal capabilities.

4.3.3. Corporate foresight - maturity

In Table 8, the results from the corporate foresight maturity can be viewed. It is stated that there is a significant difference for perceiving, meaning that Swedish firms tend to have a stronger perceiving ability than European firms, which can be seen in Figure 13. It is also stated that there is no significant difference between Swedish and European firms when it comes to prospecting and probing abilities.

Corporate foresight abilities	Significant difference between groups	p-value	Confidence level	Interpretation of result
<i>Perceiving</i>	Yes	0.0665	>90%	Swedish firms have stronger perceiving ability than European firms
<i>Prospecting</i>	No	0.2547	<90%	No significant difference between Swedish and European firms
<i>Probing</i>	No	0.3117	<90%	No significant difference between Swedish and European firms

Table 8 – Results from the Welch’s t-test – Corporate foresight

In conclusion, H_0 is rejected for perceiving, and H_0 fails to be rejected for prospecting and probing, and conclude that it cannot be said that there are any differences between Swedish and European companies on these two corporate foresight abilities.

4.4. Summary of results

A summary of the presented results is shown in Table 9, where the *overlap* column indicates when both tests show significant difference.

Dimension	p-value <i>U-test</i>	p-value <i>t-test</i>	Significant difference between groups <i>U-test</i>	Significant difference between groups <i>t-test</i>	Overlap
<i>Environmental dynamism*</i>	0.0681	0.1274	Yes	No	No
<i>Environmental complexity***</i>	0.0213	0.0470	Yes	Yes	Yes
<i>Environmental hostility</i>	0.1673	0.3355	No	No	No
<i>Information usage*</i>	0.0714	0.1460	Yes	No	No
<i>People & networks</i>	0.3201	0.5939	No	No	No
<i>Method sophistication**</i>	0.0998	0.0857	Yes	Yes	Yes
<i>Culture***</i>	0.0143	0.0340	Yes	Yes	Yes
<i>Organization</i>	0.4354	0.7131	No	No	No
<i>Perceiving*</i>	0.1434	0.0665	No	Yes	No
<i>Prospecting*</i>	0.0862	0.2547	Yes	No	No
<i>Probing</i>	0.1168	0.3117	No	No	No

Table 9 – Summary of statistical results

*= Significance at 90% confidence level for one test

**= Significance at 90% confidence level for both tests

***= Significance at 95% confidence level for both tests

5. Discussion and analysis

In this chapter, results are discussed from the statistical tests and analyzed by comparing them and referring to the theoretical framework. Furthermore, the data collection and data analysis related to the method and results are discussed and analyzed.

5.1. Comparison of results

Since two different statistical tests were made, it will be of interest to study the results and the differences between them. To recall, the European companies are Western European companies.

As seen from the results, the Mann-Whitney U-test and Welch's t-test gave slightly different results. To be able to compare the results, the analysis will be done separately for the three dimensions; environmental factors (need), internal capabilities and corporate foresight (maturity).

5.1.1. Environmental factors – need

In Table 10, the differences of the results conducted from the environmental factors can be viewed. As shown, the Mann Whitney U-test shows significant difference in two of out of three dimensions; environmental dynamism and environmental complexity, while Welch's t-test only shows significant difference in one of them, environmental complexity. This implies that the overlap of the two tests is on one of the three dimensions, namely environmental complexity. None of the tests indicated any difference with regards to environmental hostility.

Environmental factors	p-value <i>U-test</i>	p-value <i>t-test</i>	Significant difference between groups <i>U-test</i>	Significant difference between groups <i>t-test</i>	Overlap
<i>Environmental dynamism</i>	0.0681	0.1274	Yes	No	No
<i>Environmental complexity</i>	0.0213	0.0470	Yes	Yes	Yes
<i>Environmental hostility</i>	0.1673	0.3355	No	No	No

Table 10 – Comparison of results for the two statistical tests - Environmental factors

For *environmental dynamism*, it is interesting to find out why the Mann-Whitney U-test finds significant difference between the populations, while Welch's t-test gives no such result. If the QQ plots in Figure 16 and Figure 17 are viewed for environmental dynamism in appendix section 8.2, it can be seen that for the Swedish sample in Figure 16, the normal distribution fit is somewhat poor, since the sample points have heavy tails. Welch's t-test is useful when both samples follow an approximate normal distribution, but in this case, only the European sample is a good fit, as seen in Figure 17. Because of this, a higher emphasis was put on the Mann-Whitney U-test in this case. Furthermore, it is noted that the p-value for the groups being different is quite low, corresponding to an approximate 87% confidence interval in the case of the Welch's t-test. This is still a rather high confidence level, and the reason for it not being as high as the Mann-Whitney p-value can easily be explained by the weakened normal assumptions with regards to the Swedish sample. Due to these reasons, it is

suspected that there is a difference in the dimension environmental dynamism in that Swedish firms are facing *lower* environmental dynamism than their European counterparts.

Since environmental dynamism is the dimension that measures for example market dynamics, competitor behavior and customer power (Appendix 8.1) this implies that the Swedish market is a friendlier market with regards to these aspects. However, some other interesting explanations were found. One example can be found with regards to the number of surprises encountered by the company in the last three years (Appendix 8.1). Day and Schoemaker (2005) state that many companies have experienced more than three high impact events in the last three years. However, in this study, it was found that most companies had not experienced that many, if any. Also, most respondents agreed that there are a lot of disruptions happening with regards to digitalization and similar events. However, most respondents felt that their company had the means to detect these trends and be aware of any upcoming surprises. The conclusion is that whilst the dynamics of the Swedish market most likely do not differ significantly from other markets, due to digitalization being a global trend, Swedish firms tend to be more aware of that change is incoming.

With regards to the next dimension *environmental complexity*, it is easier to draw conclusions from the statistical tests. Both the Mann-Whitney U-test and Welch's t-test show a high statistical probability with confidence level over 95% that there is a difference between Sweden and Europe. Since the confidence level for both tests are high, it is strongly believed that this result is significant. This implies that Swedish firms face a *higher* degree of environmental complexity than their European counterparts. This means that overall, threats coming from other industries are greater, there are less clear market boundaries et cetera. The reason for this might be found in the innovative business climate of Sweden. As stated in the theoretical framework in 2.3, Sweden is one of the more innovative economies of the world. In line with Schumpeterian thought, this implies a higher degree of "creative destruction" and business disruptions. Intuitively, this is a logical conclusion since a more innovative economy will have more disruptive actors acting in the market, thus creating a higher environmental complexity. It is also interesting to note that this dimension considers a company's dependence on the global economy. Since Sweden is an extremely export-dependent country with a small home market, there is reason to suspect that Swedish firms to a higher degree are dependent on the global economy than their European counterparts, that often have greater access to larger home markets. In conclusion, strong theoretical support was found for that the statistical difference found by the tests are indeed real differences. A more innovative economy should face a higher degree of environmental complexity, especially one that is so dependent on the global economy as Sweden.

When it comes to *environmental hostility*, neither of the tests show significant difference between the samples, and thus it cannot be said that there are any differences between Swedish and European firms with regards to this aspect. As mentioned before, the number of data points were only 56 companies in the peer group. Even if the number of data points were above what both tests required as lower limit, it maybe is still not enough data points to draw any conclusions from it. There is a possibility that the tests would have shown other results with a larger sample.

5.1.2. Internal capabilities

When it comes to the internal capabilities, it can be seen in Table 11 that the different tests overlap on method sophistication and culture. This means that it can clearly be stated that a significant difference between Swedish and European firms exists, since both tests confirm this fact. The significant differences mean that Swedish firms are more mature than European firms when it comes to method sophistication practices and they have a more suitable culture.

Internal capabilities	p-value <i>U-test</i>	p-value <i>t-test</i>	Significant difference between groups <i>U-test</i>	Significant difference between groups <i>t-test</i>	Overlap
<i>Information usage</i>	0.0714	0.1460	Yes	No	No
<i>People & networks</i>	0.3201	0.5939	No	No	No
<i>Method sophistication</i>	0.0998	0.0857	Yes	Yes	Yes
<i>Culture</i>	0.0143	0.0340	Yes	Yes	Yes
<i>Organization</i>	0.4354	0.7131	No	No	No

Table 11 – Comparison of results for the two different statistical tests - Internal capabilities

Regarding *information usage*, the Mann-Whitney U-test states a significant difference while Welch’s t-test does not. This indicates a similar issue as with the dimension environmental dynamism in the previous section. The QQ plots in Figure 22 and Figure 23 in appendix 8.2 can be viewed for clarification. It can clearly be seen that both the Swedish sample and the European sample poorly follow the red line, which make the approximations of following a normal distribution misleading. This could be an explanation to why Welch’s t-test does not draw the same conclusion as the Mann-Whitney U-test. If their respective p-values in Table 11 are viewed, the confidence level for the Welch’s t-test is approximately 85%, which is not far from 90%. Therefore, it is believed that if the samples would have better followed a normal distribution, Welch’s t-test would have shown the same result as the Mann-Whitney U-test. As with the dimension of environmental dynamism, a stronger emphasis is put on the Mann-Whitney U-test in this case. This leads to the conclusion that Swedish firms have a *stronger* information usage than their European counterparts. An explanation to this might be found in the Swedish business climate as well as the previously mentioned dimension environmental dynamism. A stronger information usage means that Swedish firms in general tend to have a longer time horizon on the information gathered, and that it tends to be not only focus on its current business field.

Reusing the arguments made above regarding environmental dynamism, it is reasonable to suspect that lower perceived dynamism might actually be a result of a stronger information usage. A company that is stronger at gathering information about its environment might perceive its environment as being less dynamic than it actually is. The reason for the strong information usage in Sweden can perhaps be found in the high level of digitalization according to the theoretical framework, enabling firms to easily and readily access a large amount of different information sources, effectively

creating a competitive advantage to less digitalized firms. Another important aspect might be the high degree of innovation. As argued before, a more innovative economy is one where there is a higher degree of disruptive changes. This leads to companies having to be more vigilant towards changes in trends and to have a wider perspective than otherwise. In conclusion, it is argued that there is support for Swedish companies having a more improved information usage than their European counterparts.

Regarding the capability *people & networks*, both statistical tests indicate that there are no significant differences between Swedish firms and European ones. It is believed that this is a result from European companies being highly proficient with regards to both the internal and external networks. Thus, the lack of significance in this capability is not due to Swedish companies being “as bad” as European companies, but it is believed that this is a result of the European companies being “as good” as their Swedish counterparts. This can be assumed to be a reasonable conclusion when examining Figure 12, where it can be seen that the average for European companies with regards to people & networks is higher than the other capabilities.

Investigating the internal capability *method sophistication*, the results find that both tests are aligned in this case. The p-value is rather small and a corresponding confidence level above 90% was obtained. This leads to the conclusion that there are differences in this dimension when comparing Swedish and European firms. By analyzing the answers given by the respondents, it was found that Swedish firms use a higher degree of formal methods rather than relying on intuition. This is the most likely reason of Swedish firms having stronger method sophistication than their European counterparts. This is in line with the fact that Swedish society is very reliant on formal processes and bureaucracy, as seen in section 2.3; possibly influencing Swedish firms towards using more formal methods. The tendency to use more novel and creative methods might be due to the high innovation capability of Swedish firms, using not only their innovation in external activities but also innovating the methods of the firm itself.

With regards to the internal capability *culture* it is interesting to note that the differences found by the statistical tests are in line with the research hypothesis H₁ stated in section 2.4. Since a majority of the literature in section 2.3 points towards the uniqueness of the business culture in Sweden, it proposed that differences should be found in this dimension. Interesting enough is that of all the tests done with regards to the different dimensions, this is the dimension that gives the by far lowest p-value for both the Mann-Whitney U-test and Welch’s t-test. This indicates a high certainty that Swedish and European companies truly differ.

According to the questions asked in the survey, a company with a higher score on culture fosters a more tolerant business culture where insights are encouraged to be shared across the entire organization, where you tend to care about different opinions and also where there is a tradition of challenging basic assumptions. According to the theoretical framework in section 2.3, the obedience to authority is low in Swedish organizations giving theoretical support to that Swedish employees do indeed have a greater tendency of questioning known and basic assumptions than their European peers. It is also possible that the strong tradition of consensus in Swedish culture found in section 2.3 positively influences an organization to share information

through the entire organization and to not listen only to information coming from inside the company, which make Swedish firms in general more non-hierarchical.

When it comes to the dimension *organization*, none of the tests show significant difference between the samples. At first, this might seem a little bit suspicious, since the dimension of organization is closely related to the cultural dimension, where the most significance of all was found. However, it is likely that this is due to the inclusion of the question regarding incentives to employees for rewarding wider vision (Appendix 8.1). Such incentives are unusual in Sweden, and all the interviewed companies scored extremely low on this question suggesting that firms in Sweden do not provide extra incentives for wider vision. This drags down the average score of Swedish companies so it aligns with European firms. It is suspected that if this question was disregarded in the survey, it would possibly have led to there actually being a difference overall. However, the survey is constructed in a way that all questions must be used according to Rohrbeck Heger GmbH, and thus it cannot be argued that organizational capability is different in Swedish firms compared to European ones.

5.1.3. Corporate foresight - maturity

For the corporate foresight abilities, Table 12 shows the comparison between the two different tests. As can be seen, none of the tests overlap when it comes to showing significant difference between the sample groups.

Corporate foresight	p-value <i>U-test</i>	p-value <i>t-test</i>	Significant difference between groups <i>U-test</i>	Significant difference between groups <i>t-test</i>	Overlap
<i>Perceiving</i>	0.1434	0.0665	No	Yes	No
<i>Prospecting</i>	0.0862	0.2547	Yes	No	No
<i>Probing</i>	0.1168	0.3117	No	No	No

Table 12 – Comparison of results for the two different statistical tests - Corporate foresight

For *perceiving*, it can be seen that Welch’s t-test shows a significant difference between Swedish and European firms, while the Mann-Whitney U-test cannot confirm that there is any difference. This is a rather unique situation as the Mann-Whitney U-test is often the more “forgiving” of the two tests due to the non-parametric properties of the test. However, as seen from the p-value in Table 12 for the Mann-Whitney U-test, the p-value corresponds to a confidence level of approximately 86%, which is not far from the required confidence level of 90%. Since Welch’s t-test indicates a difference, it is necessary to delve deeper into the data to find if it is reasonable to suspect that there might be a difference after all. The overall results imply that Swedish firms have stronger perceiving ability than European firms, meaning that Swedish firms are stronger in scanning for trends in their current business but also outside their current business.

In general, the sample scored well on questions related to the scope of perceiving activities. That is, in general Swedish firms tend to scan not only their current business sector, but also distant ones. This is closely related to the information usage

capabilities, which were found as more proficient among the Swedish firms. However, it was found that the respondents generally indicated that even though trends were perceived, they actually went unreported or were communicated in limited formats. This implies that Swedish firms are perhaps gathering more data than they actually use, even though usage of this data would be beneficial to the firms. To summarize, since one of the statistical tests shows a high level of probability for difference and the other one gives somewhat of a support to this argument, the conclusion is, with the assistance of the arguments made above, that there are reasons to suspect that Swedish firms are somewhat more mature when it comes to perceiving trends. It should be noted that this significance is the weakest of all, and thus further research is recommended with regards to this area.

When it comes to *prospecting*, the Mann-Whitney U-test shows a significant difference between Swedish and European firms, while Welch's t-test cannot say that there exists any significant difference between the sample groups. Again, if the QQ plots in Figure 32 and Figure 33 are viewed in appendix 8.2., the Swedish sample seems to approximately follow a normal distribution, but the European sample has a poor fit to the normal distribution because of its right tail. Therefore, the Mann-Whitney U-test is more reliable in this case. The result conclude that Swedish firms are less developed than European firms on prospecting, which implies that Swedish firms are less proficient in translating the scanned trends into opportunities and threats relevant to their company. This might seem counter-intuitive given that the Swedish companies in general have a higher method sophistication capability according to the findings, which in theory should positively influence the prospecting ability. However, there exists a crucial difference between the different dimensions. Whereas a high score for method sophistication indicates that Swedish companies indeed are stronger at using different methods for finding future alternatives, while a low score on prospecting implies that they are actually less proficient at actively investigating and analyzing these alternatives.

The implications of this result are that Swedish firms have strong methods for generating future scenarios, but do not examine these matters further. This points towards the Swedish firms creating more data than they use. Interesting enough, this is the same problem found in the perceiving dimension. The conclusion is that Swedish companies are excellent at creating data, but less capable at actually using it. However, it is important to note that according to the theoretical framework, the solution is not to stop producing the data, but to start acting on it.

Finally, with regards to the dimension *probing*, none of the tests can confirm difference between the samples. A reason may be that the probing sample size of the European sample only consisted of 50 data points. Even if this number is above the upper limit for the number of data points the peer group must have in order to perform the tests, it is possible that it still is not enough for obtaining significance. Therefore, it is believed that there is a chance for the tests to show other results if a larger peer group size was used. Given the high level of innovation in Sweden, it was suspected that Swedish firms should score high on the question regarding probing through partnerships, venture activities et cetera (Appendix 8.1). Furthermore, it is believed that the strong Swedish cultural trend of decentralization (section 2.3) might lead to foresight activities being delegated to the separate business units, which according to theory is suboptimal. In conclusion, the data indicates that Swedish firms are both

stronger and weaker than their European peers with regards to probing, however the statistical tests did not allow for firm conclusions.

5.2. Primary data – Swedish sample

Here, the Swedish sample is discussed with regards to the findings in this thesis. Factors such as sample size and respondents' impact are discussed as well as possible improvements of the data.

5.2.1. Sample size

The Swedish sample consisted of 11 large Swedish companies, which can seem as a small number in comparison to the peer group of 174 companies. The dangers with a small sample are that there might be difficult to draw any larger conclusions from it. However, since the sample chosen is a random sample from the Swedish industry, which covers 91% of the sectors of commercial activity, and that this sample is large enough to cover more than 10% of the 100 largest companies in Sweden, it is argued that the sample size is enough in order to draw some conclusions about the state of corporate foresight in Sweden overall. A more desirable scenario would be to investigate a much larger sample of Swedish companies and examine if the main conclusions still hold.

In this timeframe, more data could be collected if the survey would have been distributed through email instead. But, it is argued that this would not be the best approach because of two reasons; Firstly, the quality of the overall survey answers would have been worse, since the authors of this thesis would not be present for the respondents to clarify potential questions. To not be able to trust the data to 100% is worse when the sample size is small. Secondly, the respondents that were interesting were the chief strategy officers, who are very busy individuals, and it would probably be tough for them to have time to read through an email and then on their own fill in the survey to later send it. This would require several phone calls to remind them of the survey and a bad scenario would be to collect the data too late and thus not having the time to do a thorough analysis on the data. Overall, email-distributed surveys have low response rate, which might result in this approach also resulting in a small sample size.

In conclusion, the sample size is small, but the data is trusted, since the authors of this thesis were present at all interviews and revisited six of the respondents for validation purpose. Also, as the results show, it was possible draw conclusions from this sample anyway.

5.2.2. The respondents' impact

Each company in the Swedish sample was gathered from one single interview with a single respondent. Even though follow-up meetings were held with six of the respondents, in order to minimize errors from misunderstandings, there is still the possibility that the respondent did not fully understand the questions, or that the respondent believed that the company acted in a different way than another company representative would say. In order to ensure a higher validity with regards to this, ideally multiple interviews with multiple respondents should be made at each company. However, due to the short timeframe of this thesis this would not have been possible. But to improve the validity of the data, the respondents were encouraged to bring some of their colleagues to the second meeting. Of the six companies that were

revisited, three of them brought one colleague with them to the meeting, which is slightly better for the data validation than if they would have been alone again.

Something that was noticed during the interviews was that the confidence of the respondent could have slightly affected the survey answers. For example, one respondent was very confident and scored high scores on many questions, while another respondent was more conservative in their way of answering the questions. This could be a cultural aspect of Swedes, but since the respondents were from Swedish companies, it is not believed that this affected the results. However, if the Swedish sample would have been mixed with companies from other countries, the effect would have been larger. In line with the theoretical framework (section 2.3) Swedes tend to have a high degree of modesty and avoid to brag. This might have given the survey results a downward bias, since a modest answer would for example be picking a 6 instead of a 7 if one is not completely sure which one it is. However, since the dataset consisted of Western European companies with similar values to Sweden (Hofstede, 1980) this bias is likely small compared to the rest of the data set.

5.3. Secondary data – European sample

Here, the European sample is discussed and the choice of excluding Swedish data and non-European data is explained. Furthermore, the consistency of the sample and the sample size are analyzed.

5.3.1. Exclusion of Swedish data in peer group

As mentioned in section 3.2.4, the Swedish companies found in the peer group dataset were removed. This was because the purpose with this thesis is to compare Swedish companies against the rest of Western Europe, and if the Swedish firms would have been kept in the peer group dataset, the data would have been biased. Therefore, the choice was made to remove them. There is an argument to be made for adding the Swedish firms found in the database to the Swedish sample, in order to get a larger sample to compare with. Even though inclusion of these companies would more than double the sample size, from 11 to 25 companies, it still would have been no way to validate the data, since the additional data would not be primary data. Thus, the overall uncertainty of the accuracy of the Swedish sample group would be larger, and therefore the data was omitted.

5.3.2. Exclusion of non-European data in peer group

The decision was made to exclude non-European data, and while this reduced the number of data points from 214 to 174, in other words with 40 companies, it was believed that the research became more robust. The distribution between the countries when no data was excluded was not consistent, and if the choice would be made to keep the data as it was, the comparison with the Swedish sample would be to “Rohrbeck Heger GmbH’s database” rather than European companies, since the country distribution could not be categorized to a specific region. Furthermore, the majority of the theoretical framework is made on European companies, and that there are unclear conclusions whether or not companies in emerging economies work differently with corporate foresight than in developed economies (Højland and Rohrbeck, 2017). An argument for including the companies from the US in the European sample as well could be that the climate for corporate foresight is reasonably similar to Western Europe. Nevertheless, to maintain consistency of the country distribution, these non-European firms were omitted. Moreover, it is more

interesting to compare the Swedish firms with a categorized distribution of countries, in this case Western Europe, since then actual conclusions can be drawn on how Swedish firms are different in comparison to a distribution that is known and reliable.

5.3.3. Consistency of data in peer group

As stated in 3.2.4, the database from Rohrbeck Heger GmbH consisted of company interviews from the years 2008, 2013, 2015 and 2016. However, the data from 2008 was omitted in this thesis. The main motivation for this was that 2008 is too long ago in a field as dynamic and developing as corporate foresight. The risk that the inclusion of this data would lead to severely skewed results, showing European firms as worse than what they actually are, was too great. Since the interviews for the Swedish sample were made in the beginning of 2017, it was clear that the most reasonable available data was that from 2013 and onwards, since this sample is sufficiently large to be able to draw statistically significant conclusions from the data, but at the same time not too old (less than 5 years) for representing the business environment of today. There was also the choice to only use the data from 2015 and forward. However, the available dataset would have been a lot smaller, and also not have the same level of representativeness for the European economy as a whole. Ideally, a study as this should be conducted with all interviews made at the same time in order to minimize erroneous conclusions due to improvements over time in the field of corporate foresight. But, it is still believed that the selected peer group of data between 2013-2016 was new enough for drawing conclusions.

Furthermore, the country distribution in the peer group after revision was still a bit skewed, since approximately 60% of the data consisted of companies from Germany and Denmark. At first, an attempt was made to even the dataset by removing a couple of firms from these countries, but this made the peer group sample rather small, and the reliability of the sample would decrease. Therefore, the European sample was kept as it was, and the argument was that Germany and Denmark are somewhat typical Western European countries, and conclusions could still be drawn from this sample. Also, Germany constitutes 22% of Western Europe's GDP (IMF, 2017), which is an argument of having a larger sample of German companies in the peer group. What would have made the sample group more consistent would be to have a larger sample of companies from the UK and France and a smaller sample from Denmark. But overall, the sample distribution is believed to be good enough to be able to draw conclusions from it.

When it comes to the industry distribution of the peer group, as seen in section 3.2.4 that companies are missing from the commercial industries *construction, agriculture, public sector, arts, entertainment and recreations, real estate and service companies*. Although the argument is made that the distribution represented in the peer group is decent enough, since many industries were represented, what would have made the industry distribution of the peer group more consistent would be to include some of the industries mentioned above, especially construction and service companies, since these two industries were represented in the Swedish sample.

Lastly, the data from the peer group consisted of secondary data. This made it difficult to double check the consistency of the survey answers, since the authors of this thesis never met with the companies from the database. Although, an argument is made that this is not a great loss since the European sample was sufficiently large. If

the number of data points would have been closer to 30, the issue of not being able to check if the respondents answered correctly would be larger. Another indication of the quality of data is the fact that this sample has been used in other academic research (Rohrbeck and Kum, 2017).

5.3.4. Sample size

The dataset contained survey responses from 174 different companies. In general, this can be considered to be a large enough sample to test against. However, as noted before, two questions have a reduced number of answers, namely *environmental hostility*, which had 56 survey answers, and *probing*, which had 50 survey answers. A risk with a smaller dataset is that it can be harder to see significant difference between the samples, and a larger sample might have resulted in other p-values. Therefore, as noted from the results, it cannot be said that there are any differences between the two sample groups for environmental hostility and probing. An improvement would be to gather more data for the peer group, so the dataset for these two dimensions would be large enough in order to see if the results would change. This would lead future researchers to potentially be able to draw other conclusions regarding these dimensions.

5.4. Statistical tests

Regarding the chosen statistical tests for this thesis, some discussion should be made of their suitability to this research. In order for the Welch's t-test to hold, assumptions are required of an approximate normal distribution. Since the Swedish sample consisted of 11 data points, there is a possibility that the answers are not following a normal distribution for each dimension. According to the QQ plots in appendix 8.2., all questions seem to be approximately normally distributed, which is enough for the test to hold, but in some cases the approximation is weaker. There are other ways to test for normality than constructing QQ plots. One of these tests is called *Kolmogorov-Smirnov test* (K-S test or KS test), which is a non-parametric test that compares an empirical sample against a certain distribution (Chakravarti et al., 1967). Although it is believed that the difference between using QQ plots and KS test is rather small, it can still be interesting to explore other options when checking for normality.

For the Mann-Whitney U-test, the assumption of an approximate normal distribution is not necessary. The test is a non-parametrical test, meaning that no parametric distribution is assumed or required for the test to hold. Given that the Mann-Whitney U-test performs almost as well as Welch's t-test under normality but a lot better in other situations, the Mann-Whitney U-test result can be viewed as the more robust test in this case. In summary, this means that in the cases where the Mann-Whitney U-test indicates a difference but Welch's t-test does not, there is a strong reason to believe that the Mann-Whitney U-test is correct. But where the two tests overlap in their results, it can be better validated that the results for sure are statistically secured.

Of course, other tests could have been used to retrieve results from the sample groups. Some examples are the analysis of variance (ANOVA) or analysis of covariance (ANCOVA). But, they were not applicable in this case, since the Swedish sample would be too small in order to draw any conclusions.

In summary, it is argued that the choice of the tests is very reasonable, since the choice of method consisted of one non-parametric test (Mann-Whitney U-test) and one parametric test (Welch's t-test). The reason why this method had two tests instead of one was primary based on the rather small Swedish sample, and that the results obtained would for sure be statistically secured.

6. Conclusion

Here the conclusion of the thesis is presented and the research questions are answered. Also, sustainability implications for corporate foresight is discussed followed by what this thesis have contributed with to today's research field on corporate foresight. The chapter ends with a proposition to future research.

6.1. Answers to research questions

The purpose with this thesis was to examine the need, capabilities and maturity of corporate foresight in large Swedish companies compared to large European companies, where European companies in fact are Western European companies. The research questions will therefore be answered in this section.

6.1.1. RQ1

The first research question was the following:

Are there any differences between large Swedish companies compared to large European companies when it comes to need, capabilities and maturity of corporate foresight?

The short but correct answer is yes. In fact, there are differences in all three corporate foresight dimensions; need, capabilities and maturity.

From the discussion in section 5, the conclusion was that if both tests showed significant difference between the two samples, there is a strong support of stating that there exists a difference. Also, it was stated that the Mann-Whitney U-test is given more weight than the Welch's t-test, since Mann-Whitney does not require any parametric distribution of the samples. Welch's t-test requires an approximate normal distribution in both samples, and as discussed in section 5, the approximate normal distribution was not perfect in every case. From the discussion, a conclusion is drawn on the support level of the statistical tests when one test shows significance and when both tests do. The support level is ranked according to Table 13 below:

Significant difference between groups	Welch's t-test	Mann-Whitney U-test	Both tests
Support level	Less Strong	Strong	Very strong

Table 13 – Support level categorization

Hence, the following conclusions are obtained in line with Table 14:

Corporate foresight dimension	Statistical difference between Swedish and European firms	Support level	
Need	Environmental complexity***	Very strong	*= Significance at 90% confidence level for one test
Need	Environmental dynamism**	Strong	
Capability	Culture***	Very strong	**= Significance at 90% confidence level for both tests
Capability	Method sophistication**	Strong	
Capability	Information usage*	Strong	***= Significance at 95% confidence level for both tests
Maturity	Perceiving*	Less strong	
Maturity	Prospecting*	Strong	

Table 14 – Conclusion of results for RQ1

6.1.2. RQ2

The second research question was the following:

If yes, how and why are they different?

First, it is established *how* they are different:

Need:

- **Environmental dynamism:** Swedish firms have a lower environmental dynamism than European firms, meaning that Swedish firms act in a calmer environment than European firms.
- **Environmental complexity:** Swedish firms act in a more complex environment than European firms.

Capabilities:

- **Culture:** Swedish firms have a more suitable culture with regards to corporate foresight than European firms.
- **Method sophistication:** Swedish firms have a higher method sophistication than European firms, meaning that Swedish firms use a wider range of methods in evaluation.
- **Information usage:** Swedish firms have stronger information usage capabilities than European firms with regards to corporate foresight.

Maturity:

- **Perceiving:** Swedish firms have stronger perceiving abilities than European firms, meaning that Swedish firms are stronger in sensing trends.

- **Prospecting:** Swedish firms have less developed prospecting abilities than European firms, meaning that Swedish firms are less proficient at analyzing trends.

Now, it is concluded *why* they are different. To be able to answer this part of RQ2 the answers were found in the theoretical framework together with the survey answers from the Swedish companies, which were discussed in section 5. The answer is as follows:

Need:

- **Environmental dynamism:** Swedish firms tend to be more aware of changes in the market, and therefore do not easily get surprised when new events happen. This leads to a lower perceived dynamism.
- **Environmental complexity:** Swedish firms have a higher dependency on foreign markets than on the local, since Sweden is an export-dependent country with a small home market. The perceived complexity for Swedish firms will therefore be higher, since the global market is more complex than the local.

Capabilities:

- **Culture:** Swedish firms are often less hieratical, which should have a positive influence on information sharing through the entire organization.
- **Method sophistication:** Since Swedish firms often are highly innovative, they tend to use methods in more creative and innovative ways than the European counterparts.
- **Information usage:** Due to the increased innovation rate in the Swedish business climate, Swedish firms are more likely to have a stronger information usage with longer time horizons and information gathering outside their ordinary business fields. Also, the high digitalization rate among Swedish companies contributes to the strong information usage.

Maturity:

- **Perceiving:** Swedish firms are strong at detecting upcoming trends and disruptions in their industries. This is likely due to them being active in more disruptive environments, requiring them to have heightened sensing ability.
- **Prospecting:** Due to a tendency to gather large amounts of information but failing to analyze and translate them into insights, Swedish firms perform less proficient in the prospecting dimension.

In summary, it is difficult to state if Swedish firms have stronger corporate foresight abilities overall than European firms, therefore no conclusions can be drawn on a general level. When it comes to the three dimensions need, capabilities and maturity, it is hard to draw conclusions if Swedish firms are in greater *need* overall for corporate foresight than European firms, or the opposite. Therefore, no conclusion can be made of the overall need level. For capabilities, Swedish firms have

statistically stronger *capabilities* in three out of five internal capabilities, where the two remaining (organization and people & networks) have no statistically secured differences. Therefore, the conclusion can be drawn that Swedish firms have overall stronger capabilities than European firms when it comes to corporate foresight. Lastly for maturity, no conclusion can be drawn of the overall *maturity* level of Swedish firms compared to European firms.

6.2. Evaluation of research hypothesis

The research hypothesis formulated for this thesis was:

H₁: *There will be a difference on the capability level for corporate foresight in a Swedish setting. Especially with regards to the culture dimension.*

As stated in section 5.1.2, the research hypothesis was correct. Interesting enough, the cultural capability dimension was where the tests indicated the highest probability for difference among Swedish and European firms.

6.3. Sustainability implications for corporate foresight

Sustainability can be addressed through the three aspects; social, environmental and economical. This approach is also called the *triple bottom line* (TBL), where the purpose is to create superior business value (Elkington, 1994). To discuss sustainability in this thesis, the reasonable way would be to analyze it through TBL.

The social responsibility refers to people in an organization being treated fairly. With regards to corporate foresight, it is possible to view especially two of the internal capabilities as connected to this. These two are *organization* and *culture*. A high score on the dimension of culture implies a tolerant culture, where different opinions are welcome and encouraged, and where there is high tolerance for challenging of basic assumptions. A high score on organization implies an organization that considers issues coming from both the top and the bottom as important, that focuses on integrating the entire company and that gives incentives to its employees for stimulating wider vision. Companies that score higher in these dimensions can be said to have stronger internal capabilities for foresight. However, companies that score higher with regards to these dimensions also have a more sustainable way of working, especially when it comes to viewing each individual employee as an important part in the organization that deserves acknowledgements for successful work. In summary, it can be argued that companies with more mature internal capabilities, especially with regards to the capabilities culture and organization, are likely to also have higher social sustainability.

The environmental sustainability perspective creates interesting implications when combined with corporate foresight. Will (2008) argues that since environmental sustainability is becoming increasingly important, more companies will be forced to adapt strategies that respond to this fact. There are strong arguments for using corporate foresight being appropriate since it supports the development of these strategies (Will, 2008). As such, corporate foresight can be an excellent tool for making companies more sustainable and aligned with current environmental macro-trends. From another perspective, new technologies and processes also tend to be more environmental friendly than older ones. Thus, strategic thinking, supported by

corporate foresight should in theory lead to the adoption of more modern, and thus more climate-friendly methods.

The economical sustainability benefits of corporate foresight activities are perhaps the most obvious TBL aspect. As Doane and MacGillivray (2001) note, there is a need to approach the subject from both the inside perspective of the firm, but also the outside. This means that for financial performance, the firms' impacts on the business climate and the return to shareholders all should be considered. In the theoretical framework, the value contribution of corporate foresight was outlined. Firms categorized as having a high level of maturity of corporate foresight were found to have a much higher market capitalization growth (section 2.2.6). This reflects increased return to shareholders as well as increased profitability, and therefore it suggests stronger financial performance of corporate foresight-aware firms. In summary, it can be argued that firms that can be said to respond well to discontinuous and radical change, in other words firms with a high maturity of corporate foresight, are likely to be economically sustainable companies.

6.4. Contribution to the research field of corporate foresight

The contribution made with this thesis to today's research field on corporate foresight can be summarized in three points. Firstly, to in a statistically secured way state that Swedish firms act in a more complex environment but are less sensitive to dynamism in the environment (need), that Swedish firms have stronger capabilities in general than European firms, specifically when it comes to culture, method sophistication and information usage, and that Swedish firms have stronger perceiving abilities but weaker prospecting abilities (maturity) than European firms. Secondly, this thesis has shown that it is possible to use a quantitative approach when measuring corporate foresight, which have only been done in a very limited way before. Thus, the authors of this thesis encourage future researchers to also use quantitative methods. Thirdly, the survey from Rohrbeck Heger GmbH is validated, which is also used by for example Rohrbeck and Kum (2017) for measuring corporate foresight, where it is encouraged to explore this survey further by future researchers.

6.5. Future research

One interesting aspect of this thesis is that it successfully implements quantitative research methods in the research of corporate foresight. A recommendation to future researchers is therefore to consider expanding their research by conducting quantitative analysis. It should be noted that this kind of research is resource intensive, and therefore large datasets are required. This thesis would not have been possible to conduct without access to Rohrbeck Heger GmbH's database.

Most of the current research is centered around the Western world, but with emerging markets facing similar disruptions it is interesting to see if there is a possible successful use of corporate foresight in this setting. Therefore, further studies on corporate foresight in emerging economies is recommended. Adding to this, even though this study was conducted in Sweden, this subject is not considered to be exhausted. Thus, additional studies are recommended on the Swedish market where more companies should be interviewed to establish a more definite result. Of course, this argument applies to other country-specific studies as well.

Another possible future research field is the continued exploration of the use of corporate foresight as a tool and strategy to increase sustainability across the whole triple bottom line. One interesting topic would be the theoretical study for linking economic sustainability to dynamic capabilities, Schumpeterian dynamics as well as corporate foresight. Another topic worth pursuing would be the empirical study of how corporate foresight activities can contribute to companies creating more environmentally sustainable business plans and products.

7. References

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8. Appendix

8.1. Survey

Survey and Benchmark on Organizational Future Preparedness

Dear participant,

Aarhus University invites you to participate in a study to investigate and benchmark your organization's future preparedness and how it goes about competing for markets of the future.

Completing the survey will take approximately 20 minutes. Your answers to the survey will be treated as confidential.

Thank you very much for your participation!

All data gathered through this survey will be made available in a form that will make it impossible to determine the identity of the individual respondents or their organizations. Confidentiality of all survey responses is guaranteed.

1

General information about your organization

ORGANIZATION/ POSITION

Please provide us with your organization's name, business unit name if applicable, and your position within your organization:

This data is only used for internal administrative purposes. Confidentiality of all survey responses is guaranteed.

Your organization's name	
Your business unit's name (if applicable)	
Your position/function	

If you have entered that you are part of a business unit:

- In any of the questions, the word **'organization'** then refers to your business unit specifically.
- Please **answer all the questions specifically for this business unit** and not for the entire organization

2

Corporate environment of your organization

I	NATURE OF YOUR STRATEGY
	Choose one of the statements below that most closely describes your current organization:
1	Strategy 1 This organization typically operates within a broad product-market domain that undergoes periodic redefinition. The organization values being "first in" in new product and market areas even if not all of these efforts prove to be highly profitable. The organization responds rapidly to early signals concerning areas of opportunity, and these responses often lead to a new round of competitive actions. However, this organization may not maintain market strength in all of the areas it enters.
2	Strategy 2 This organization attempts to locate and maintain a secure niche in a relatively stable product or service area. The organization tends to offer a more limited range of products or services than its competitors, and it tries to protect its domain by offering higher quality, superior service, lower prices, and so forth. Often this organization is not at the forefront of developments in the industry—it tends to ignore industry changes that have no direct influence on current areas of operation and concentrates instead on doing the best job possible in a limited area.

On this page, we ask you to evaluate how the corporate environment of your organization / business unit can be characterized on a range of dimensions.

Please indicate in the following scales which best describes your organization's business environment. The scale permits you to give nuanced answer which description (left or right) matches best your organization's business environment. You may also choose an option in between the two statements depending upon your best estimate of an intermediate position.

II	COMPLEXITY OF YOUR ENVIRONMENT		
1	Industry structure	(circle a number)	
	Few, easily identifiable competitors	1 2 3 4 5 6 7	Many competitors from unexpected sources
2	Supply chain structure		
	Simple and direct	1 2 3 4 5 6 7	Long and complex
3	Market structure		
	Fixed boundaries and simple segmentation	1 2 3 4 5 6 7	Fuzzy boundaries and complex segmentation
4	Enabling technologies		
	Few and mature (simple systems)	1 2 3 4 5 6 7	Many converging (complex systems)
5	Regulations (federal, state, etc.)		
	Few or stable	1 2 3 4 5 6 7	Many or changing rapidly
6	Public visibility of industry		

	Largely ignored	1 2 3 4 5 6 7	Closely watched by media or special-interest groups
7	Dependence on government funding and political access		
	Low: operates largely independent of government	1 2 3 4 5 6 7	High: sensitive to politics and the funding climate
8	Dependence on global economy		
	Low: affected principally by domestic conditions	1 2 3 4 5 6 7	High: affected by global conditions

III DYNAMISM OF YOUR ENVIRONMENT

1	Number of surprises by high-impact events in the past three years		
	None	1 2 3 4 5 6 7	Three or more
2	Accuracy of past forecasts		
	High: small deviations from actual forecasts	1 2 3 4 5 6 7	Low: results differs greatly from forecasts
3	Market growth		
	Slow and stable	1 2 3 4 5 6 7	Rapid and unstable
4	Growth opportunities		
	Have decreased dramatically in the past three years	1 2 3 4 5 6 7	Have increased dramatically in the past three years
5	Speed and direction of technological change		
	Very predictable	1 2 3 4 5 6 7	Highly unpredictable
6	Behaviour of key competitors, suppliers, and partners		
	Very predictable	1 2 3 4 5 6 7	Highly unpredictable
7	Posture of key rivals		
	Live-and-let-live mentality	1 2 3 4 5 6 7	Hostile (aggressive)
8	Susceptibility to macroeconomic forces		
	Low sensitivity to price changes, currencies, business cycle, tariffs, etc.	1 2 3 4 5 6 7	High sensitivity to price changes, currencies, business cycles, tariffs, etc.
9	Dependence on financial markets		
	Low	1 2 3 4 5 6 7	High
10	Customer and channel power		
	Low	1 2 3 4 5 6 7	High
11	Sensitivity to social changes (fashion and values)		
	Low: mostly gradual change from the past	1 2 3 4 5 6 7	High: good chance of major disruptions and changes in business models

12	Potential for major disruptions in the next five years		
	Low: few surprises expected, mostly things we can handle	1 2 3 4 5 6 7	High: several significant business shocks are expected, without knowing which in particular

IV HOSTILITY OF YOUR ENVIRONMENT

1	Industry riskiness	(circle a number)	
	Very safe; little threat to the survival and well-being of my firm	1 2 3 4 5 6 7	Very risky; a false step can mean my firm's undoing
2	Industry munificence		
	Rich in investment and marketing opportunities	1 2 3 4 5 6 7	Very stressful, exacting, hostile; very hard to keep afloat
3	Environment dominance		
	An environment that my firm can control and manipulate to its own advantage, such that a dominant firm has in an industry with little competition and hindrance	1 2 3 4 5 6 7	A dominant environment in which my firm's initiative counts for very little against the tremendous competitive, political, or technological forces

3 Corporate foresight capabilities

On the next 4 pages, we ask you to evaluate how well your organization / business unit undertakes activities and is organized to detect, anticipate, and respond to longer-term future trends or issues.

Please indicate in the following scales which best describes your organization. The scale permits you to give nuanced answer which description (left or right) matches best your organization. You may also choose an option in between the two statements depending upon your best estimate of an intermediate position.

A INFORMATION SCOPE IN SCANNING

1	Reach	(circle a number)	
	Almost all of our scanning attention is directed towards our current business	1 2 3 4 5 6 7	We systematically scan our entire environment including our current business, adjacent business and in far away fields
2	Scope		
	Focus on one environmental area (technology, political, competitor, customer and socio-cultural environment)	1 2 3 4 5 6 7	We systematically scan all environmental areas (technology, political, competitor, customer and socio-cultural environment)

3	Time horizon		
	Emphasis on short term (e.g. 1 to 3 years)	1 2 3 4 5 6 7	We systematically scan all, the short and medium to long-term (medium beyond 4 years)
4	Usage of sources		
	Few open access sources	1 2 3 4 5 6 7	Many sources including sources that are difficult to access and yield a competitive advantage

B METHOD SOPHISTICATION

1	Integration capacity	(circle a number)	
	Low; we rely mostly on experience-based intuition rather than explicit methods to interpret our environment	1 2 3 4 5 6 7	High; we systematically utilize a range of formal methods (such as scenario analysis and roadmapping) to create alternative future outlooks
2	Communication capacity		
	Low; we rely primarily on formal reports that are distributed to explicate the strategy (including vision, mission, milestones)	1 2 3 4 5 6 7	High; we use a large variety of communication mechanisms to paint motivating pictures of our strategic ambitions (we may utilize videos, strong narratives, pictures of desirable future states)
3	Choosing of methods (problem fit)		
	We usually do not know what methods we can apply and when to apply these, thus most of the time the choice of methods is guided by which have been used in the past	1 2 3 4 5 6 7	We carefully evaluate the situational needs for methods and employ regularly novel methods and develop our own approaches
4	Choosing of methods (context)		
	We have used methods in the past that did not lead to the wanted results	1 2 3 4 5 6 7	We know about limitations of methods we use and often systematically plan on how to overcome the limitations by using multiple methods that complement each other

C SENSING

1	Sensing capability	(circle a number)	
	Our sensors are able to identify a small number of important trends	1 2 3 4 5 6 7	Our sensors ensure that we detect 80% of all trends that will shape our industry in the next 5-10 years
2	Report capability		
	Trends are identified but not systematically reported	1 2 3 4 5 6 7	We report trends regularly and in formats that are adequate to the internal stakeholders. We use for

			example trend radars, trend briefs and trend reports, which are also available through the Intranet
3	Response capability		
	We provide the original information that we collected when detecting the trend	1 2 3 4 5 6 7	We provide the information about why the trend matters to our company; how we could act, and provide examples of suitable actions

D PEOPLE & NETWORKS

1	External network	(circle a number)	
	Weak (Some employees have external personal networks)	1 2 3 4 5 6 7	Strong (Building and maintaining a network of external partners is encouraged and perceived as important for every employee)
2	Internal network		
	Weak (Some employees have formal and informal contacts to other units within the organization)	1 2 3 4 5 6 7	Strong; employees are expected to build and maintain formal and informal networks to other units
3	Traits of personnel that engages in corporate foresight		
	Weak (e.g. analysts have only deep knowledge in their domain)	1 2 3 4 5 6 7	Strong (Analysts have strong internal and external networks, deep and broad knowledge, and are passionate, curious and open minded)

E ORGANIZATION

1	Mode of gaining future insights	(circle a number)	
	Mostly triggered top-down and issue-driven	1 2 3 4 5 6 7	Both continuous and issue-driven scanning that can be triggered bottom-up and top-down
2	Integration with other processes		
	Weak	1 2 3 4 5 6 7	Strong (corporate foresight activities are directly linked to other processes in the organization, e.g. to the mid-term strategy process)
3	Formal diffusion of future insights		
	Emerging issues are occasionally presented at dedicated meetings	1 2 3 4 5 6 7	Discussion of emerging issues is part of central meetings in all relevant units
4	Accountability		
	No defined responsibility for detecting emerging issues	1 2 3 4 5 6 7	We have a dedicated unit that performs scanning duties and serves as a hub to collect future insights generated by others inside and outside the

			organization
5	Incentives to reward wider vision		
	No incentives in place	1 2 3 4 5 6 7	We employ a large variety of incentives to encourage employees to contribute to a wider vision of the organization

F SENSEMAKING SUCCESS

1	Number of alternatives	(circle a number)	
	Single. We typically identify the one best strategic alternative	1 2 3 4 5 6 7	Multiple. We often consider multiple futures and have systematic ways for defining strategy in environments with different levels of uncertainty
2	Distance of alternatives		
	Low. We typically select the most feasible over the most desirable alternative	1 2 3 4 5 6 7	High. We have in the past repeatedly acted upon ambitious strategic alternatives that were distant to our current strategy
3	Exploration capability		
	We are best at exploring our current markets and/or adjacent to our current markets	1 2 3 4 5 6 7	We have in the past repeatedly explored new markets that were distant to our current business and typically feel that we have had an information advantage over our competitors

G CULTURE

1	Willingness to share across functions		
	Poor (Information is ignored and hoarded)	1 2 3 4 5 6 7	Excellent (Ongoing information sharing on multiple levels)
2	Readiness to listen to scouts and external sources		
	The organization is closed (Contacts to the outside are discouraged)	1 2 3 4 5 6 7	The organization is open (Bringing external information into the company and maintaining an external network is encouraged)
3	Organization's attitude towards the environment		
	Limited and myopic (Few people care)	1 2 3 4 5 6 7	Active and curious (Scanning the periphery is commonplace)
4	Willingness to test and challenge basic assumptions		
	The basic assumptions are neither known nor made transparent	1 2 3 4 5 6 7	We are not afraid to reflect critically on the shared assumptions we have about our market, customers, and the way we do business

G		PROBING IN NEW MARKETS	
1	Dedicated unit	(circle a number)	
	We rely mostly on existing business units to explore new markets within their market scope	1 2 3 4 5 6 7	We have a dedicated unit that has the mandate to explore and develop new markets that can become a significant contributor to our overall revenues
2	Scope		
	Low. Our activities for exploring new markets are limited to low-risk probing (for example through showing new offerings to existing customers)	1 2 3 4 5 6 7	High. Our activities for exploring new markets can take the form of venture investments, alliances, acquisitions, mergers, and substantial investments in assets such as factories

4

General information about your organization

On this page, we ask you to provide us with information about your organization, such as its size, industry, recent performance, and expenditure patterns.

A		YOUR ORGANIZATION OR BUSINESS UNIT								
1	Please indicate the size of your organization (in employees): (circle a number)									
	Less than 10	10-49	50-249	250-499	500-999	1000-5000	5000-10.000	10.000-50.000	50.000 or more	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Please indicate your organization's principal industry:									
	<input type="checkbox"/>	Telecom / Digital & Business Services				<input type="checkbox"/>	Automotive			
	<input type="checkbox"/>	Energy & Utilities				<input type="checkbox"/>	Manufacturing			
	<input type="checkbox"/>	Healthcare & Pharmaceutical				<input type="checkbox"/>	Retail & Consumer Business			
	<input type="checkbox"/>	Chemical				<input type="checkbox"/>	Transportation			
	<input type="checkbox"/>	Finance & Insurance				<input type="checkbox"/>	Other: _____			
3	Revenue of your organization over the last fiscal year (2015) (in million EUR):									
	Less than €5 million EUR	€5 million - €1 million EUR	€1 million - €5 million EUR	€5 million - €10 million EUR	€10 million - €50 million EUR	€50 million - €100 million EUR	€100 million - €500 million EUR	€500 million or more		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4	Revenue of your organization in 2010 (in million EUR):									
	Less than €5 million EUR	€5 million - €1 million EUR	€1 million - €5 million EUR	€5 million - €10 million EUR	€10 million - €50 million EUR	€50 million - €100 million EUR	€100 million - €500 million EUR	€500 million or more		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5	If your organization has grown considerably over the last 5 years, please indicate to which extent that was inorganically (through acquisitions):									
	<input type="text"/>									
6	What is your annual R&D expenditure* as a percentage of sales (if applicable)? <i>* All expenses associated with the search of new knowledge as well as new products/services/process development.</i>									
	<1%	1-3%	4-6%	7-9%	10-12%	13-15%	>15%			
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

7 Please indicate the extent to which you agree with the following statements referred to your organization over the last three years: (1 = strongly disagree; 7 = strongly agree)							
	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
We have uncommitted resources that can be used to fund strategic initiatives at short notice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have large amount of resources available in the short run to fund our initiatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We will have no problems obtaining resources at short notice to support new strategic initiatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8 To what extent does each of the following factors describe your organization's most recent product development activity? (if applicable) (1 = strongly disagree; 7 = strongly agree)							
	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The product offered was new to the firm and industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The customer or client needs served were new to the firm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It was a breakthrough innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The users of the products or services were new to the firm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The new product was based on a revolutionary change in technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9 Please indicate your extent of agreement about how well your organization has performed over the last year relative your two key competitors on each of the performance indicators mentioned below. (1 = much worse; 7 = much better)							
	Much worse	Moderately worse	Slightly worse	About the same	Slightly better	Moderately better	Much better
Sales growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Profitability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
New product success	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sales share of new products/services (i.e. products or services introduced in the last 5 years)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Market share	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Return on investment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8.2. QQ plots

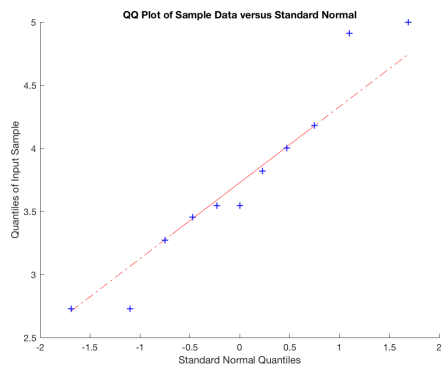


Figure 16 – Environmental dynamism Sweden

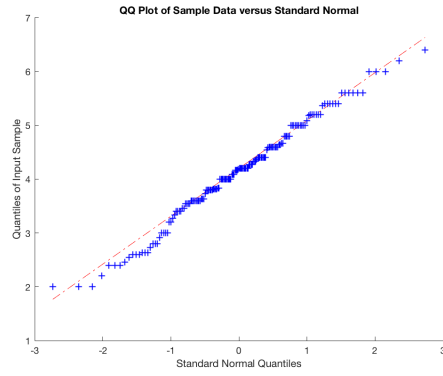


Figure 17 – Environmental dynamism Europe

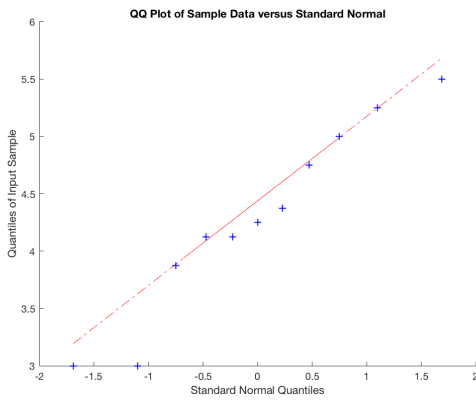


Figure 18 – Environmental complexity Sweden

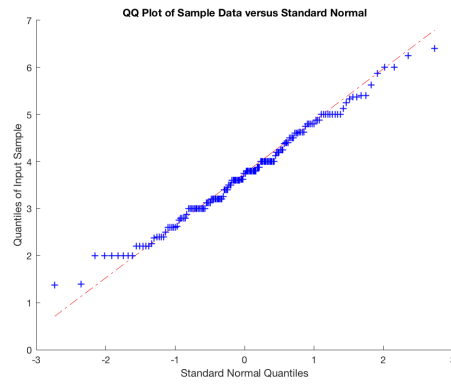


Figure 19 – Environmental complexity Europe

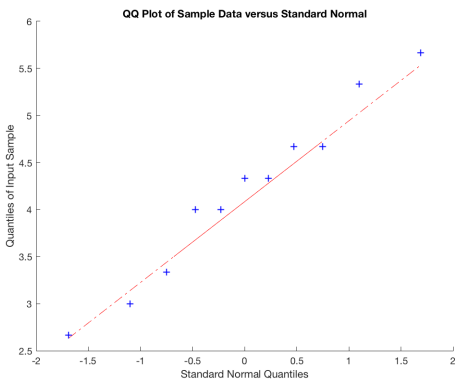


Figure 20 – Environmental hostility Sweden

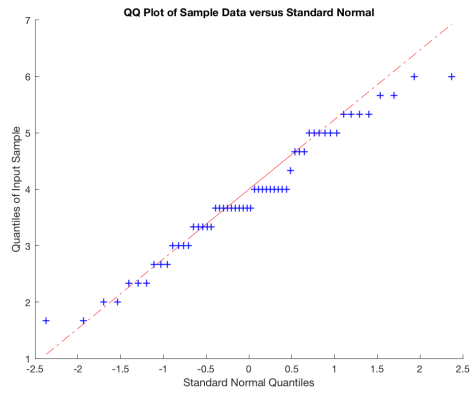


Figure 21 – Environmental hostility Europe

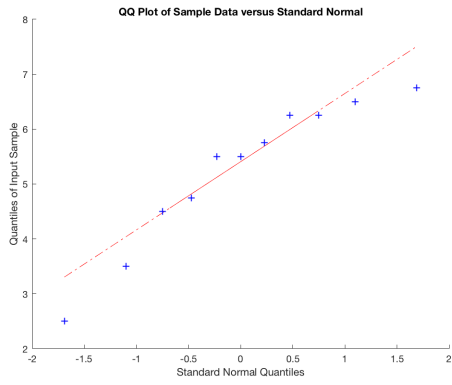


Figure 22 – Information usage Sweden

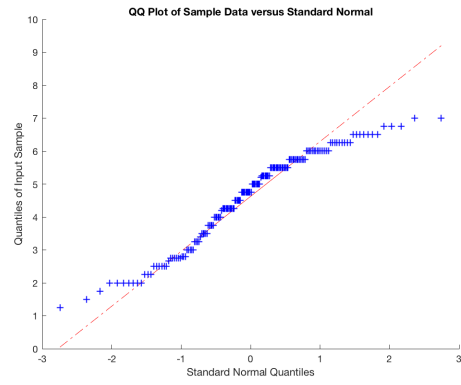


Figure 23 – Information usage Europe

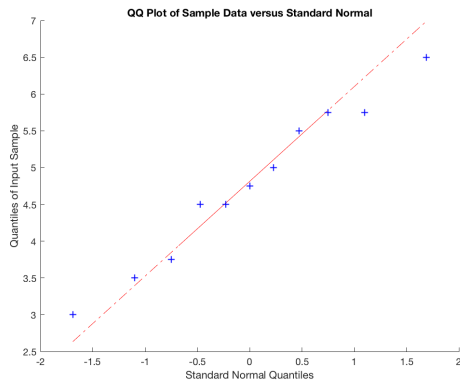


Figure 24 – Method sophistication Sweden

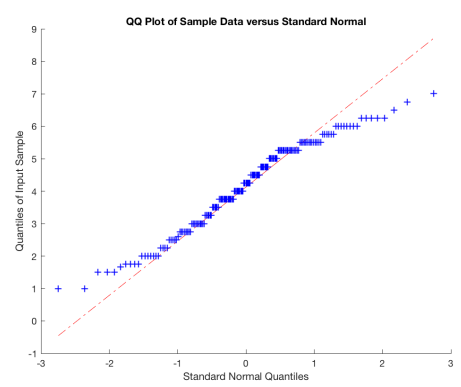


Figure 25 – Method sophistication Europe

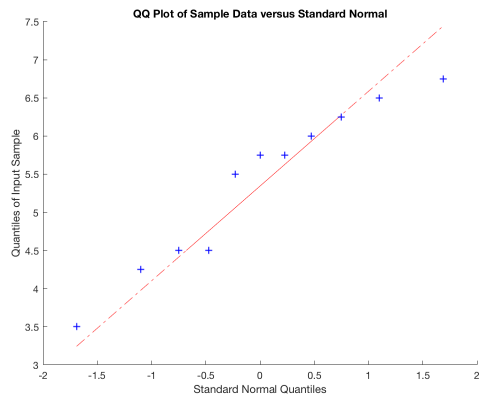


Figure 26 – Culture Sweden

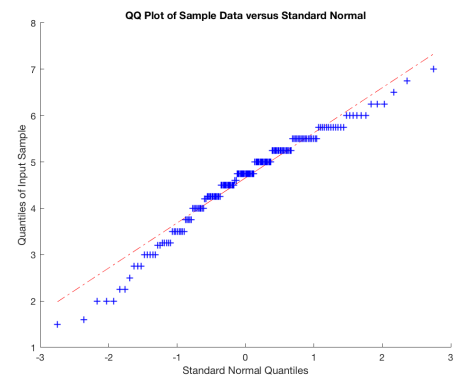


Figure 27 – Culture Europe

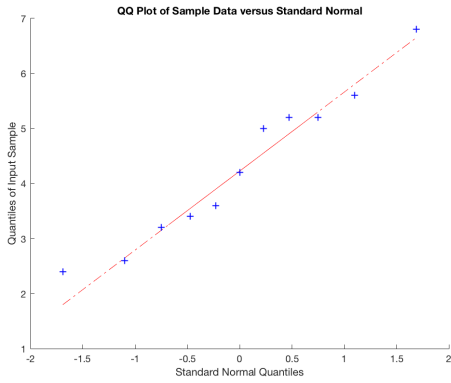


Figure 28 – Organization Sweden

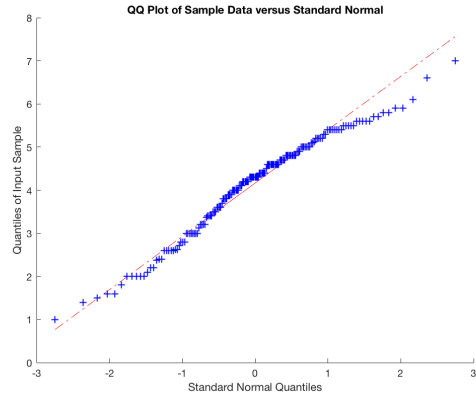


Figure 29 – Organization Europe

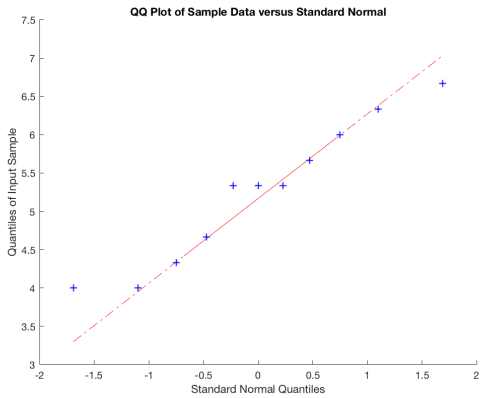


Figure 30 – Perceiving Sweden

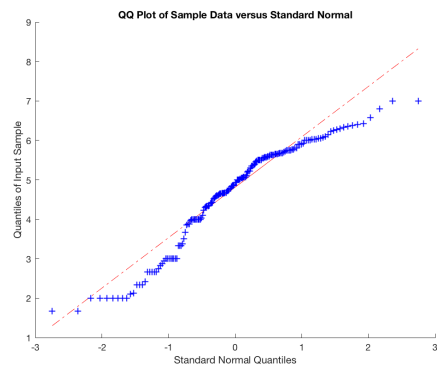


Figure 31 – Perceiving Europe

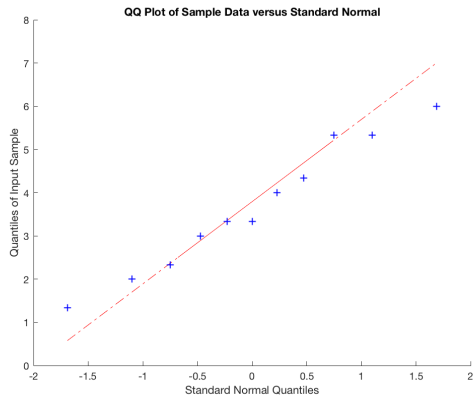


Figure 32 – Prospecting Sweden

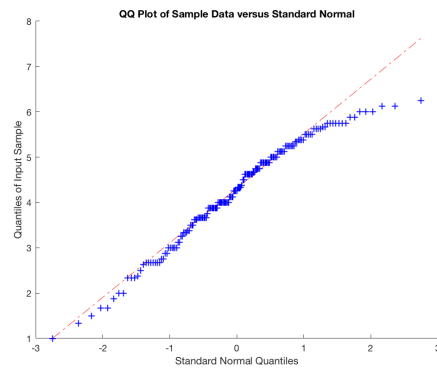


Figure 33 – Prospecting Europe

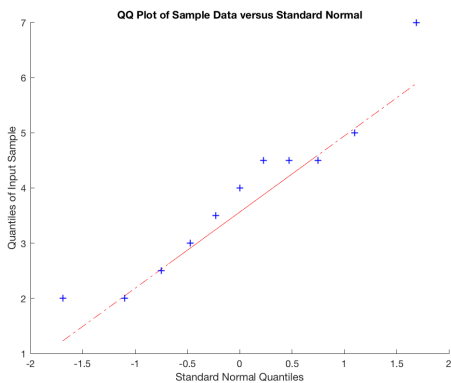


Figure 34 – Probing Sweden

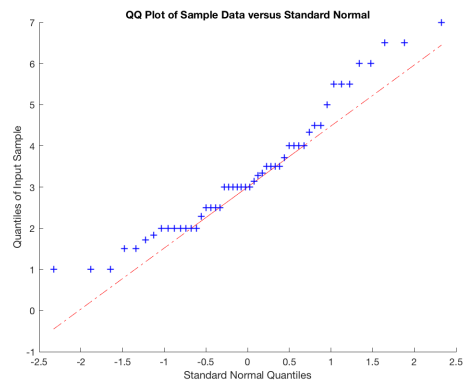


Figure 35 – Probing Europe

