CHALMERS
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Decisions Regarding Production Location within the Swedish Textile and Apparel Industry today and in 2025

Master's thesis in Supply Chain management

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Abstract

The textile and apparel industry is known for being at the forefront in manufacturing sourcing in new countries and collaboration with external manufacturers is very common. Studying how textile and apparel companies take decisions regarding production location is interesting since they represent one of the most global industries in the world, and some elements could be applicable in other industries where offshore production is a newer, less exploited phenomenon.

This report includes a study that was performed in order to investigate where Swedish textile and apparel companies produce today, how it will change within then years and what factors that lie behind the decisions. The applied research strategy was a survey in the form of a questionnaire that included 119 Swedish textile and apparel companies. Interviews were also performed with some of the participants that represented large actors within the industry.

The research showed that Swedish textile and apparel companies produce globally, but that the major part of production is performed in Europe and Asia. The largest share of the industry's production is located in China followed by Sweden, the Baltic countries and other European regions. In Asia, Bangladesh and India have the second and third largest production share after China. The results indicate a stagnation of production in Asia as well as an increase of production in Europe and Africa until 2025.

The study showed that location decisions are affected by internal factors, specific for the company and their products, and external factors specific for the location. Economic factors are by many companies considered as the most important factors but the availability of the right competence is also important together with existing relationships and political stability in the area. The results indicated that large companies are more likely to move their production and that there is a positive relationship between previous moves and change of production within the next ten years.

This study provides a unique overview of the Swedish textile and apparel companies, and gives an insight in what factors that are important to consider in global production networks.

Keywords: Textile and apparel industry, Supply chain management, sourcing, purchasing, manufacturing, production location

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Gothenburg
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1. Introduction

In this section a brief historical and theoretical background to the scientific field is provided, followed by the project purpose and the research questions.

1.1. Background

Industry is today facing an increased globalisation with complex, worldwide supplier networks as a natural result. A consequence of this is the increased importance of effective global supply chain management in order to handle the complex supplier networks (Christopher et al., 2004). Supply chain management and purchasing are today recognised as key business drivers (van Weele, 2014).

One important decision within supply chain management and purchasing is where to source from or where to produce. This decision was already in 1969 named one of the key decisions of operations strategy by Skinner (Skinner, 1969) and it should be taken with careful consideration of several factors since it can have huge impact on the profitability (Porter, 1986; Hartman et al., 2011). Typical questions that need to be answered are whether to produce domestically or to offshore, but also whether to produce in-house, to outsource or to purchase (Kohler & Smolka, 2014).

One of the world's most global industries is the textile and apparel industry (Abernathy et al., 2006). The whole manufacturing process is very seldom performed by one single actor and depending on the actor's position in the value chain, weaving, knitting and sewing is commonly performed by third parties (Shelton & Wachter, 2005). The tradition of outsourcing has enabled manufacturing in low-cost, development countries, which has led to tough competition in order to reach the lowest production cost (Bruce et al., 2004; Christopher et al., 2004).

Textile products are characterised by their relatively simple production process that is often standardised and entry barriers are low (Chen & Fung, 2013). This has made it easy for a large amount of producers to enter the industry providing companies with a wide range of possible suppliers world-wide (Chen & Fung, 2013). The textile and apparel business in general, and the fashion industry in particular, is characterised by short product life cycles, fast changes in market demand and hard competition (Bruce et al., 2004; Christopher et al., 2004).

Low cost has traditionally been one of the most important drivers behind moving production off-shore (Cook, 2007; Swoboda et al., 2008), but cost alone cannot motivate these decisions and several factors need to be considered.

1.1.1. Previous research

There is an extensive amount of literature on the textile and apparel industry and its characteristics; however, the *Swedish* textile and apparel industry is a less explored field. There is no recent study that has investigated how the Swedish textile and apparel companies plan to move within the future, and what factors that lies behind these decisions.

1.2. Purpose

The aim of the project is to analyse where Swedish textile and apparel companies produce today and where they plan to produce in 2025. Further, the project aims to analyse what factors that lie behind production location selection and to investigate whether there are any differences between different types of companies.

1.3. Research questions

The project aims to answer four research questions. The first two questions are concerning the location of production, today and in 2025. The purpose of answering these questions is to provide an overview of the production locations within the textile and apparel industry.

> *RQ1: Where are Swedish textile and apparel companies locating their production today?*
>
> *RQ2: How will the Swedish textile and apparel companies change the location of their production until 2025 and why?*

Having a clear strategy for supply chain have become more important as consequence of globalisation and an increased complexity of supplier networks. Even though many small companies may not have a clearly stated strategy, the third research question aims at investigating what factors that are most important when choosing production location.

> *RQ3: What factors do textile and apparel companies take into consideration when locating production?*

The research questions above together provided a good base for the project and for the data analysis. They make sure that the results provide a comprehensive understanding of the location decisions within the apparel and textile industry in order to answer the last research question:

> *RQ4: How are decisions regarding production location affected by external and internal factors?*

The aim of the last question is to find how the decision regarding production location differs between different types of companies and how the decisions are affected by external and internal factors.

1.4. Delimitations

The study only includes Swedish textile and apparel companies. What companies that fit in to the description is based on the Standard Industrial Classification (SIC) codes. The scope of companies is limited to firms with a turnover greater than 10 million SEK. The limits are set in order to provide a sample that is big enough (see Methodology chapter). The interest is to identify where, in what world continents and countries, companies' products are manufactured today and in 2025, and what factors that affect these decisions. The products can be either directly bought from a supplier that has full control over the design and manufacturing process or designed and produced on request of the company.

2. Methodology

In this section the methodology applied in the study is described. Firstly, a brief description of the research process in provided. Thereafter follow detailed descriptions of each research step in order to give the reader an understanding of how the study was carried out. Lastly, the methodology is discussed.

2.1. Research process

The purpose of the study was to answer the research questions stated in the previous chapter, and by doing so, investigate where Swedish textile and apparel companies locate their production and why. In order to answer the research questions a deductive research approach was applied. Data collection included a literature review, interviews and a survey including Swedish textile and apparel companies.

The study was performed according to the process map shown in Figure 1 below. Firstly, the initial data collection was performed. It included a literature review and preliminary interviews that together laid ground for the theoretical framework and the survey. The analysis of the survey results was performed when all survey answers had been collected and it included both a descriptive and a statistical part. Additional data collection and interviews were performed after the survey answers had been analysed in order to enrich and check the accuracy of data. All of these steps are described in the following sections.

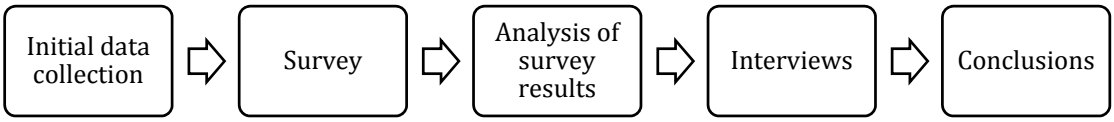

Figure 1: Research process

2.1.1. Initial data collection

A literature review was performed as a part of the initial data collection as a first stage in the process. The literature review had the purpose of creating an understanding of the scientific area and to create a theoretical framework that laid ground for the survey. It provided information on what factors that influence sourcing decisions in supply chain management in general and textile and apparel in particular and information on the present state.

The literature that was examined included industry reports, scientific papers, newspaper articles, journal articles and textbooks.

Preliminary interviews were performed with the aim to collect additional information and to create an understanding of the field. With this background interviewees with knowledge about and experience from the textile and apparel industry were chosen. The interviews included the General Secretary at the industry association TEKO (Sveriges Textil- och Modeföretag), two experts from the academic field at the Swedish School of Textiles in Borås and a CEO at an apparel company. The interviews were performed in parallel with the literature review at an early stage of the project, and it was therefore suitable with unstructured interviews of a conversational nature in order to get a broad view of the subject rather than detailed knowledge.

The interviews played an important role in the development of the survey questions by making sure that all the important areas were covered. Information from these

interviews was also used to form the theoretical framework, when these sources are used they are marked with footnotes.

2.1.2. Survey

The research was mainly based on a survey in the form of an email questionnaire that was sent out to companies within the textile and apparel industry. The survey included a large sample of companies and generated extensive data that made it possible to get an overview of general tendencies regarding production locations and importance of different decision factors in the industry. The main strength of using a survey as the research strategy was that it made it possible to include a large sample, which provided a good basis for analysis and general conclusions regarding the industry.

2.1.3. Analysis

The fourth step in the research process was to analyse the data gathered in the survey. The goal was to use the data generated from the survey in order to answer the research questions and in order to do so, the analysis included both a descriptive and an explanatory part. The difference between different types of companies, based on internal factors, was analysed in order to find out if, and in that case *how*, the location decisions and decision factors differ between different types of companies.

2.1.4. Interviews

After the survey data had been collected and analysed, a number of tendencies regarding future production were identified. Therefor, respondents from different companies that represent at least one of the tendencies were contacted and asked to participate in additional case interviews. Six additional interviews with six respondents from different companies were performed over telephone. The additional interviews contributed with qualitative data serving as a complement to the quantitative data provided by the survey. The interviews were performed with the purpose of increasing the understanding of the location decisions and the affecting factors. The interviews were semi-structured, based on a formal procedure with pre-defined questions but with room for follow-up questions as the interviews proceeded. All participants received the survey results and the interview questions on beforehand, which was done in order to have a large basis for discussion. Each participant was asked about his or her survey answers and the underlying decision factors were discussed. The results from the additional interviews are presented together with the main findings from the survey.

2.2. Data collection

The data that was collected included information of both quantitative and qualitative nature. A literature review was performed together with preliminary interviews in order to lay ground for the conceptual framework that was used in the study. A survey and additional interviews were performed based on the framework, which is explained in detail in the Theoretical framework in chapter 3.

2.2.1. Literature review

The literature review included different sources of different type, such as journal articles, scientific papers, newspaper articles and textbooks. The use of different types of sources made it possible to create a theoretical framework including supply chain theory, industry characteristics and a review of the current situation regarding global production within the textile and apparel industry. The academic sources provided an overview of previous research within the area, and it also provided an understanding of the research's position in a broader context. Reviewing newspaper sources created an overview of the current situation.

The literature review, together with the preliminary interviews described in the next section, together laid ground for the theoretical framework that formed the conceptual model that laid ground for the survey.

2.2.2. Interviews

Two sets of interviews were performed, preliminary interviews as a part of the initial data collection, and additional interviews that were performed after the survey had been analysed. Both sets of interviews were performed over telephone.

The preliminary interviews followed an unstructured procedure, which is suitable at an early stage of a project were the main purpose is to "explore" a new subject (Denscombe, 1998) and it is recommended that these types of interviews are performed in advance of creating a survey (Williamson, 2002). The purpose with these interviews was to get an understanding of the industry and what factors that lie behind the location decisions. The interviewees were people with experience from the field that could contribute with general information.

The additional interviews followed a semi-structured procedure and all interviewees received a document with the questions in advance in order to prepare for the interviews. Semi-structured interviews mean that pre-defined questions are used, but there is room for additional questions to be asked which gives the interview a more conversational nature (Denscombe, 1998; Williamson, 2002). The purpose of the additional interviews was to enrich the data gathered from the survey with information from specific cases, with the aim to get an understanding of how companies reason regarding production location decisions, since all thoughts and opinions are not possible to capture through a structured survey.

2.2.2.1. Sample description

The interviewees in the preliminary interviews were chosen based on their experience and knowledge within the field, and because they were known to have deep knowledge about the Swedish textile and apparel industry. The name and title of the interviewees are listed in the table 1 below.

Table 1: Interviewees preliminary interviews

Name	Position	Organisation or Company
Elin Lydahl	General Secretary	TEKO
Rudrajeet Pal	Lecturer	Swedish school of textiles
Jonas Larsson	Lecturer	Swedish school of textiles
Hans Segerqvist	CEO	Company X

Additional interviews were performed when the survey data had been collected and analysed. The interviews included six different cases, and all were companies that had participated in the survey study. The cases and the interviewed persons are listed in table 2 and all interview questions can be found in Appendix C.

Which method that is most suitable when selecting cases depends on the purpose of the interviews, and if special cases are to be investigated the emphasis should lie on identifying and interviewing key informants (Denscombe, 1998). With this background, the cases were chosen based on the results from the survey in order to have at least one representative from each tendency regarding future production that had been identified. All companies that were selected were large, with a turnover greater than 100 million SEK. The companies and the interviewees are listed in the table below, however the real company names have been replaced with fictional names. A short description on each case, where they produce today and their plans for the future production locations as well as what tendency each company represent can be found in Appendix G.

Table 2: Interviewees additional interviews

Company	Interviewee position	Textile group	Annual turnover [M SEK]	Main product	Competitive element
Company A	Supply Chain Director	T*	500	Protective apparel products	Strong brand
Company B	CEO	F&A**	126	Work wear	High service
Company C	Design and Product development director	F&A**	500	Underwear	Strong brand
Company D	CEO	F&A**	85	Shoes	Strong brand
Company E	Production Manager	F&A**	500	Apparel	High quality
Company F	Development and Sourcing Manager	F&A**	700	Outdoor apparel	High quality

***Technical textiles **Fashion & Apparel**

All interviewed persons had large influence on location decisions, either on a strategic or an operational level.

2.2.3. Survey

The most important data in this study was collected through a survey and the instrument that was used was an email questionnaire. The questionnaire is the most commonly used research instrument for conduction surveys (Williamson, 2002).

Surveys are suitable for business research and when it is desirable to include a large sample in order to get a general view of a phenomenon (Denscombe, 1998; Kothari, 2004). However, there are some pitfalls that need to be avoided. Firstly, there is a risk of ambiguity in the survey questions, which can bias the answers. In order to avoid this

the survey should be designed carefully and tested (Kothari, 2004). Secondly, even though surveys are effective in terms of collecting large amounts of data the rate of return is usually low, which could lead to biased answers since there is a risk that the respondents do not represent the sample (Kothari, 2004). Larger return rates help to minimise the risk of non-representativeness and these can be achieved by careful design, by adding deadlines and sending out reminders (Williamson, 2002).

The survey was of both descriptive and explanatory nature. A descriptive survey aims at describing a state (what, when, where) whereas an explanatory survey requires statistical analysis with the aim of explaining *how* and *why* (Tanner, 2002). The descriptive analysis was used to answer research question 1, 2 and 3 and the explanatory analysis was used to answer research question 4.

The survey questionnaire used in the study was structured, which means that all respondents were asked the same questions in the same order (Kothari, 2004). All questions were closed except for the last one where the respondents could add other thoughts or opinions regarding the subject. Closed questions mean that the respondents are provided with multiple alternative answers to choose from and it makes the output easier to handle. Structured surveys with closed questions are easier to analyse and it also helps the understanding of the question for the respondents when they are provided with alternative answers (Kothari, 2004).

It is important that the order and formulation of the questions in a survey are carefully considered (Williamson, 2002; Kothari, 2004). The question sequence was designed in a way that was intended to feel natural and intuitive for the respondents, starting with fairly simple questions, such as “What is your role”, and questions that needed more thought, for example regarding production location and external factors, were placed at the end. In order to avoid the risk of ambiguity or unclear questions the survey was tested and revised by people at Montell & Partners with experience from similar studies. The content of the questions was based on the conceptual model that was formed based on the initial data collection, namely the literature review and preliminary interviews. In order to make it easy for the respondents to understand the questions and the alternatives, some academic terms were reformulated into every-day language. The survey questions are listed in Appendix B.

2.2.3.1. Sample selection

The survey played a central role in the study. It included a sample of small, medium and large sized companies within the textile and apparel industry in Sweden. In order to limit the sample size, a lower limit in terms of annual turnover over 10 MSEK was set. Larger companies were considered more relevant for the study since they are more likely to have strategies for future production location but also in order to make the results from this study transferrable to other industries where companies usually have larger turnovers.

The identification of survey participants was based on SIC codes. SIC is an international, standardised framework that describes the main activity of companies by the use of numerical codes. The companies that were included in the survey were those who had the SIC codes listed in table 3 below. Note that the shaded fields only indicate the superior group and do not indicate that all of the subgroups were included. Leather and fur producers were excluded from the study.

Table 3: SNI codes for sample selection

SNI code	Name
13 Manufacture of textiles	
13.1	Preparation and spinning of textile fibres
13.2	Weaving of textiles
13.3	Finishing of textiles
13.9	Manufacture of other textiles
14 Manufacture of wearing apparel	
14.1	Manufacture of wearing apparel, except fur apparel
14.12	Manufacture of work wear
14.13	Manufacture of other outerwear
14.14	Manufacture of underwear
14.19	Manufacture of other wearing apparel and accessories
14.3	Manufacture of knitted and crocheted apparel
14.31	Manufacture of knitted and crocheted hosiery
14.39	Manufacture of other knitted and crocheted apparel
47 Retail trade, except of motor vehicles and motorcycles	
47.51	Retail sale of textiles in specialised stores
47.71	Retail sale of clothing in specialised stores

The sample was limited to the list provided by the market analysis organisation Largest Companies who provided contact information to decision makers and financial data for 388 different companies. The survey was sent out by email to production managers, buyers, CEOs, supply chain managers or similar roles within the companies that have insight into production site decisions.

With the aim of getting as many respondents as possible, the survey was in some cases sent to several different decision makers within the same company. This was done in order to increase the return rate in terms of number of responding companies. The number of companies included in the sample was limited to the database that was provided by Largest Companies.

2.2.3.2. Sample description

The survey was sent out to the sample by using an online survey software. The first email invitation was sent to 388 companies. Reminders were sent out to the companies that not had respondent at three different occasions with approximately one-week intervals.

When the deadline for responding the survey had passed, companies with a turnover larger than 50 million SEK that had not responded the survey were contacted over the telephone, which resulted in some additional answers. The number of responses for each email invitation is presented in table 4 below.

Table 4: Sample description

Invitation	No. of Invited companies	No. Of Responses
Email 1	388	47
Email 2	341	36
Email 3	305	21
Email 4	284	17
Phone	60	18
Total number of responses		**139**
Non-respondents		249

2.2.3.3. Disqualifications

Once the collection of answers was completed, the responses were checked in order to remove duplicates or unfinished questionnaires. In some cases several decision-makers within the same company had answered the survey and since it was only relevant with one answer per company the multiples were excluded and only the answers from the respondent with the highest position within the company was kept. This caused a reduction of 14 responses. Six of the responses were incomplete and hence excluded from the responses. After the disqualification of responses had been performed, 119 answers from 119 companies remained, according to table 5 presented below.

Table 5: Survey responses

Number of usable responses	
Total number of responses	**139**
Company Duplicates	14
Incompletes	6
Excluded responses	**20**
Usable responses	**119**

A total number of 119 respondents resulted in a response rate of 30,6%. In order to analyse why the rest of the sample did not respond, each company's relevance for the study were checked manually. By reviewing web pages and business information sites additional information on these companies was gathered and revised. This process lead to a reduction of the sample since it became clear that some companies were not relevant for the study, either since their main products were not textiles or apparel or since their head office was not situated in Sweden. During the process it was also discovered that the sample included several companies within the same company group, and these duplicates were also excluded. The process resulted in a disqualification of 49 companies from the sample, which meant that the number of potential respondents decreased to 339 companies, as shown in table 6.

Table 6: Potential survey respondents

Number of potential respondents	
Total sample	**388**
Brand duplicates	33
Not Swedish based	16
Excluded companies	**49**
Potential respondents	**339**

A sample of 339 companies and 119 respondents resulted in a response return rate of 35,1 %.

2.3. Statistical Analysis

As a fourth step in the research process, the survey data was analysed in order to answer the research questions. The process included a descriptive analysis as well as an inferential, or statistical, analysis. This section of the report gives a thorough description of the statistical analysis.

2.3.1. Classification

In order to find out how the location decisions varied depending on company and product characteristics, the companies were classified according to different internal factors according table 7 below. All of these classifications were analysed against the site locations, today and in 2025, and the importance of external factors. The purpose was to find similarities within the classes but also differences between them. The theoretical background behind these classifications is described in the theoretical framework in chapter 3.

Table 7: Classification of company characteristics and product characteristics

Parameter	Data type	Values
Type of Company	Nominal	Fashion and apparel
		Interior textiles
		Technical textiles
Company size (A)	Ordinal	<20 MSEK
		20-50 MSEK
		50-100 MSEK
		100 MSEK - 1 BNSEK
		> 1BNSEK
Company size (B)	Ordinal	Small and medium companies (Less than 100 MSEK)
		Large companies (More than 100 MSEK)
Customers	Nominal	Consumers
		Companies
		Government agencies
Own production or not	Nominal	Yes
		No
Importance of closeness between production and different operations	Ordinal	Market
		Design and product development
		Warehouse
		Head quarter
		Research and development

Number of moves	Ordinal	1-3 times
		>3 times

Two different types of data were used in the survey, *nominal data* and *ordinal data*. Nominal data is data were the categories do not have values that can be ordered in a logical sequence, but instead have different names (Williamson & Bow, 2002), for example the different types of textile groups. Ordinal data can be ordered on a scale, but there is no decided distance between the points, for example the size of a company based on turnover (Williamson & Bow, 2002).

2.3.2. Survey

The last questions in the survey, questions 11 to 25, measured production location and importance of external factors. These questions generated extensive data that was analysed in Excel and in the statistical software SPSS. The distribution of answers was analysed with Excel and the statistical software SPSS was used to statistically compare data between the different classes described above. In order to be able to analyse the answers they were coded and numerical values assigned to the different alternative answers.

Statistical testing should be performed in order to make sure that differences between groups do not occur because of sampling error (Williamson & Bow, 2002). In statistical testing a hypothesis is tested. The hypothesis is usually in the form of a null hypothesis, which assumes that there is no connection between variables (Tanner, 2002). The null hypothesis is rejected when the probability, or p-value, is lower than the significance level.

Statistical significance was considered confirmed for values lower than 0,05, which is appropriate according to research conventions (Tanner, 2002). A significance level at 0,05 means that the confidence interval is 95% and that there is a high probability that the same differences would occur if the whole population would be tested (the whole population in this case refers to all textile and apparel companies with a turnover larger than 10 million SEK). If the probability level is as low as 0,01, it means that there is likely a strong link between the variables with a confidence interval of 99% (Tanner, 2002).

For normally distributed samples parametrical tests such as t-test and ANOVA should be used to analyse mean differences (Williamson & Bow, 2002). The t-test is applied when the mean of two different groups is compared and ANOVA is used when there are more than two groups (George et al., 2005). These tests were used to analyse the mean difference between groups for importance of closeness and for the external factors. For the ANOVA test Tukey's pairwise comparison test was used in order to find which factors that differed between the groups.

Non-parametric tests can be used when data is not normally distributed (Williamson & Bow, 2002). Mann-Whitney tests were used to analyse production in different areas and number of moves within the last five years.

Chi-square tests should be used when both the dependent and independent factors are nominal (George et al., 2005). For the survey data it included namely all data that was generated from the questions regarding change, where the categories were increase,

unchanged or decrease of production and the question regarding the desired capabilities.

The test methods applied for each survey question are listed in table 8 below.

Table 8: Statistical analysis methods

Question no:	Parameter	Data type	Test
11	Importance of closeness between production and different operations	Scale	t-test and ANOVA
12	Production in different world continents	Ordinal	Mann-Whitney
13	Number of moves (A)	Ordinal	Mann-Whitney
13	Number of moves (B)	Ordinal	Mann-Whitney
14	Change of production in different world continents	Nominal	Chi-2
15	Desired capabilities	Nominal	Chi-2
16	Production in different Asian countries	Ordinal	Mann-Whitney
17	Change of production in Asian countries	Nominal	Chi-2
18	Production in different European countries	Ordinal	Mann-Whitney
19	Change of production in European countries	Nominal	Chi-2
20-24	External factors	Scale	t-test and ANOVA
25	External factor groups	Scale	t-test and ANOVA

2.3.3. Interviews

The data from the additional interviews, in terms of interview transcripts, was structured according to the research questions and analysed for each research question. The purpose of the analysis of the data from the additional interviews was to confirm and increase the understanding of the results from the analysis of the survey data.

2.4. Methodology discussion

In this section the methodology used is discussed and possible strengths and weaknesses of the research approach is analysed.

2.4.1. Validity and reliability

The validity of research refers to whether the result reflects the reality and whether it covers all important areas (Denscombe, 1998). The three main types of validity are internal, external and construct validity (Tanner, 2002).

Internal validity means that the study is carried out in a way that ensures that the conclusions that are drawn are based on actual relationships, and not factors that appeared by chance (Denscombe, 1998; Tanner, 2002). An essential part of increasing the internal validity is to statistically test the results. All relationships between variables that were found in this study were based on statistical analysis with a 95% confidence

interval, which means that the probability that the results are caused by chance is low (Tanner, 2002). The results were discussed with all interviewees during the additional interviews that also received the survey results in advance of the interviews, which helped to increase the validity of the results.

External validity is concerning whether or not the results are transferrable to the whole population (Tanner, 2002). A high response rate increases the external validity for a survey (Tanner, 2002). The response rate for email questionnaires is usually low and there is no exact limit for what is considered a high rate since it is highly dependent on the form of research and the sample characteristics. Even though there is no specified value for what response rates that are high, the response rate of 35 % for the survey can be considered sufficient compared to similar studies (Swoboda et al., 2008; Andersson & Segerdahl, 2012).

Construct validity "refers to the extent to which a measure actually measures the construct it was designed to measure" (Tanner, 2002, p. 128). All questions in the survey were carefully designed and tested by management consultants at Montell & Partners as well as by an expert at Chalmers, who all got to try the survey and give input before it was finalised in order to increase the construct validity. The questions were formulated as clear and simple as possible in order to avoid any ambiguity or misunderstanding.

Reliability of research "refers to the consistency of results produced by a measuring instrument when it is applied more than once in a similar situation" (Tanner, 2002, p. 128). It should be highlighted that the measurement of production changes until 2025 is based on predictions from the respondents, and there is a large uncertainty in these values. However, respondents were not asked about exact numbers for increase or decrease in the different areas - but instead asked to simply rate if and how they plan to change. This should mean that the results have a higher reliability than if the respondents were asked for exact numbers, which would have a larger uncertainty than simply "increase" or "decrease".

All survey respondents and interviewees had positions within the companies that could be considered relevant for the study since they are all in some way involved in decisions regarding production location, both in operational short-term and strategic long-term decisions.

Regarding location of production today, the respondents were asked to specify the amount of production in different areas within specified intervals (see Appendix B). This was mainly done in order to make it easier for the respondents to answer the questions. During the descriptive analysis some simplifications were done in order to make it possible to analyse the answers in order to draw general conclusions. The simplification comprised a translation from the intervals to a single value in the middle of the specified range, for example a share of production between 10-30% in a continent was converted into 20% and so on. This gives the descriptive analysis of share of production a degree of uncertainty, but this uncertainty would be hard to avoid even if the respondents were to specify their production share with exact numbers, since these values are usually not easily accessible.

2.4.2. Sample error

The representativeness of the sample was investigated based on the turnover size of the respondents. The sample was compared to the population (the companies listed in the database), which confirmed that distribution of company sizes was representative for the whole population, as shown in table 9.

Table 9: Sample error

Revenue (SEK)	Sample	Percentage	Population	Percentage
>1 BN	4	3%	15	4%
100 M - 1 BN	47	39%	116	30%
50 M - 100 M	23	19%	78	20%
20 M - 50 M	33	28%	104	27%
10 M - 20 M	12	10%	75	19%
Total	119	100%	388	100%

2.4.3. Implications of the research approach

A survey allows for collection a large amount of data, especially in the shape of an email questionnaire. However, some limitations were caused by the choice of method. Firstly, the sample representativeness for the entire population was difficult to ensure due to the shortfall of responses, which is a common problem with surveys. Secondly, the questionnaire, which was structured with mainly closed questions, restricted the answers from the respondents to the alternative answers that were provided. Since the respondents filled out the questionnaire on their own without the presence of a researcher, they were not able to ask questions if any questions were unclear. A third limitation of using the questionnaire as a method for the survey strategy was that the number of questions needed to be limited in order to increase the response rate. If the questionnaire would have been to long, there could have been a risk that the respondents would have ended before the questionnaire was completely filled out, which would have given a lower response rate.

However, the survey had a relatively high response rate compared to similar studies. The survey was also carefully designed and tested on beforehand, which decreased the risk of ambiguity. The respondents had the opportunity to leave a comment in the last question regarding their thoughts about the survey, and no comments indicated that the questions were unclear.

Even though there were some limitations of the survey approach, the amount of data that was possible to collect with this approach could not have been collected with any other approach. Since the survey results were discussed with participants in the study during the additional interviews, the reliability of the results were checked and the respondents also had the opportunity to add information that did not fit into the survey.

3. Theoretical framework

This section outlines the theoretical framework that served as a basis for the research. Firstly, a general overview of the textile and apparel industry is provided, including the value chain and its different actors. A brief description of the global production is then provided, followed by a description of the building blocks of the conceptual model that served as a basis for the survey.

3.1. The global textile and apparel industry

The textile and apparel industry is one of the most global industries in the world (Abernathy et al., 2006). Globalisation can be seen as the phenomena where companies are competing with similar products in markets all over the world (Slack & Lewis, 2011). Globalisation has contributed to changed market conditions, due to less market regulations, information technology development and decreased transportation costs (Puig et al., 2009; Shelton & Wachter, 2005). The phenomena has caused major changes in the way companies manage their supply chains, allowing for them to look world-wide for the best suppliers, and not only source locally (Slack & Lewis, 2011). In this way globalisation has also resulted in complex global supplier networks that have made effective supply chain management a crucial part of staying competitive (Puig et al., 2009, Su, 2013).

Two central processes within globalisation are offshoring and outsourcing (Kotabe & Mudambi, 2009). Offshoring is the process of moving parts of the business to another country; the activities could be performed by a third party or kept within the company. Outsourcing is an overlapping concept that includes subcontracting processes to third parties. By tradition, the most commonly offshored and outsourced activity is labour-intensive, high-volume production with the goal of achieving low production cost due to for example low local wages (Perry & Towers, 2012; Shelton & Wachter, 2005).

In the textile and apparel industry, the whole manufacturing process is very seldom performed by only one company, and depending on the company's position in the value chain, weaving and sewing is commonly performed by third parties in development countries (Shelton & Wachter, 2005). This is partly an effect of the globalization process (Shelton & Wachter, 2005). In many cases, these activities have never been performed internally but instead they are performed in partnerships with producers through contracting or the finished goods are purchased from suppliers. In order to include all cases of manufacturing site selection, both for cases of purchasing, outsourcing and offshoring, the term production location selection will hence be used.

3.2. Textile and Apparel Companies and the Value Chain

The schematic illustration, figure 2, below gives a general view of the textile and apparel value chain. The first step is production of raw materials, which includes raw material for natural fibres (such as cotton, viscose, wool etc.) and for synthetic fibres (such as petroleum, gas etc.). The second step is spinning of yarn, which is the production of either natural or synthetic fibres. Thirdly, the yarns are used to produce fabrics in the process of weaving and knitting. This step also includes dyeing, printing and finishing of the fabrics. The apparel and interior-manufacturing step is when the fabrics are turned into clothing or interior products, and this step included activities such as designing, sewing, packaging and similar. The last step, retail, includes marketing, branding and sales. Some of the technical textiles leave this value chain before this step and are used in other industries, such as the automotive industry. The

textile and apparel industry can be divided according to where companies in the supply chain are active, as shown in the figure[1].

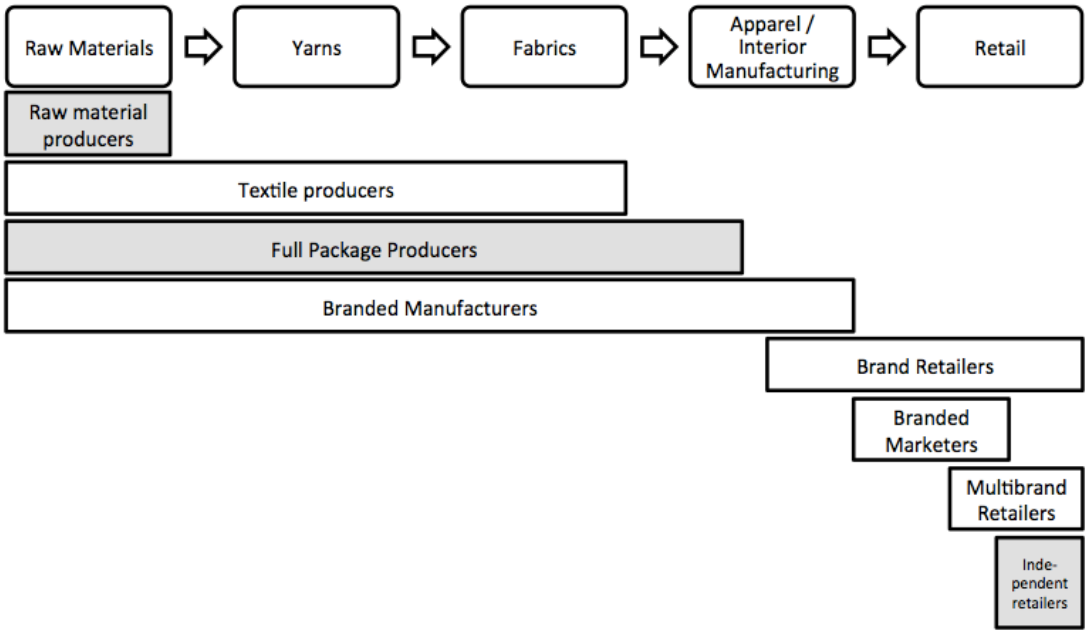

Figure 2: The Textile Value Chain and Company types

Based on the activities in the value chain, eight different types of companies can be distinguished[2][3]. Raw material producers, Textile producers, Branded Manufacturers and Full package producers are manufacturing companies that own parts of their production while Branded marketers, Branded retailers, Multi-brand retailers and Independent retailers are retail companies that do not own any production. Roughly, these can also be divided into manufacturing companies and retail companies (Hartman et al., 2011). A full description of the company types is provided in table 10 below.

Table 10: Type of company

Type of company	Description
Manufacturing companies	
Raw material producers	Companies that produce raw materials, such as cotton or oil, sometimes as by-products from other types of production.
Textile producers	Companies that produce fabrics and other textiles. Apart from fabric production, activities sometimes include, production of raw material and yarn production
Branded Manufacturers	Companies that have their own brand and in-house production (owns their own factories). The processes can include either parts of or (very unusual) the whole value chain.

[1] Rudrjajeet Pal, Lecturer in textile management, Swedish School of Textiles, University of Borås, Interviewed on the 4th of March, 2015

[2] Rudrjajeet Pal, Lecturer in textile management, Swedish School of Textiles, University of Borås, Interviewed on the 4th of March, 2015

[3] Jonas Larsson, Lecturer, Swedish school of textiles, University of Borås

Full package producers	Companies from which for example branded retailers buy their clothes. The branded retailers create their own design and the full package producers produce the whole product and the branded retailers usually pay per volume or per hour (standard amount of time to manufacture one piece of garment).
Retail companies	
Branded marketers	Companies that have their own product development, design, sales and distribution but that do not have any resale or production and usually only sell their own products in through independent retailers or *flagship stores*. Examples are brands such as Filippa K, Acne and Peak Performance.
Branded retailers:	Companies that have their own brand and owns their retailers (stores). They have an integrated flow and do not have any distributors.
Multi-brand Retailer	Companies with either franchised or self-owned stores that may have their own clothing lines but are also retailers of other brands.
Independent retailers	Small stores with a small number of employees that are retailers of other brands.

3.3. Industry characteristics

The textile and apparel industry is one of the world's oldest industries (Edström et al., 2013). It can be divided into three different sections: fashion and apparel, interior and technical textiles[4]. The Swedish industry produces 80 million tons of textiles per year, whereas 52% are within fashion and apparel, 25% within interior textiles and 12% in technical textiles (Edström, 2013). 9% of the produced materials are nonwoven textiles that are used within all the three other sections (Edström, 2013).

The textile and apparel industry, especially fashion industry, is characterised by short product life cycles and hard-to-predict changes in demand (Bruce et al., 2004; Christopher et al., 2004; Hartman et al., 2011; Chen & Fung, 2013) that needs to be managed together with the increased lead-times and decreased flexibility that global sourcing has resulted in (Christopher et al., 2006). A trend within the recent years is a drastic increase in the number of seasons per year[5] where the fashion retailer Zara lies in the forefront with around 20 seasons per year (Christopher et al., 2004).

Low-entry barriers have made it easy for new producers to enter the market, which has made it possible for companies to source from different suppliers world-wide in order to reach the most advantageous solutions (Chen & Fung, 2013).

3.4. Production of textile and apparel in the world 2015

The following sections aims at summarising the textile and apparel industry in the world from a global perspective.

[4] Elin Lyhdal, General Secretary, Sveriges Textil och Modeföretag, Interviewed on the 11th of March, 2015

[5] Rudrjajeet Pal, Lecturer in Textile management, Swedish School of Textiles, University of Borås, Interviewed on the 4th of March, 2015

3.4.1. Asia

Asia holds several of the largest textile and apparel producing companies in the world and it stands for around 70 % of the global apparel exports (Just-style, 2012). The largest importing regions are the EU, the US and Japan. In 2007 sourcing directly from producers in Asia was the most commonly applied sourcing strategy among Swedish textile and apparel companies (Åkesson et al, 2007).

China is the largest and most established, textile and apparel producing country. However, it is a country under change where labour costs are increasing together with other production costs (Jacob, 2013; Chao & Lu, 2015), such as cost for energy and water[6]. Other large suppliers in the North-East Asia are Taiwan and South Korea, both specialised in production of so-called man-made fibres. Taiwan is also one of the world's leading suppliers of apparel while South Korea has a large share of smart and eco-friendly textiles (Just-style, 2012).

India is the second world-leading producer of textile and apparel, partly because of its rich access to raw materials (Govt. of India, 2014). Its neighbour, Bangladesh, with its more than 5000 factories, is another one of the largest apparel producing countries in Asia (The Economist, 2013). 75% of Bangladesh's export income comes from textile and apparel and it is the largest exporter of mass-produced, standard apparel goods such as t-shirts and singlets to the EU (Just-style, 2012).

Goods produced in Bangladesh are duty free for companies within EU and the labour cost are lower here than in any other Asian country (The Economist, 2013), which has made it attractive. However, Bangladesh's textile and apparel manufacturing has suffered from several accidents where factory workers have been injured and killed, calling for harder regulations to increase worker safety. One example is the Rana Plaza factory that collapsed in April 2013, killing more than a thousand workers (The Economist, 2013).

Other Asian countries that have a large export of textile products are Vietnam, Pakistan and Indonesia that all have low labour costs and the last two also a rich supply of cotton (Just-style, 2012).

3.4.2. Europe

While Asia is associated with low cost, European suppliers are associated with high-quality products and the lead times are usually shorter (Åkesson et el., 2007; Hartman et al., 2011).

Today it is mainly low volume production that is performed in Sweden[7] and standardised, mass production of textile is instead offshored to low-cost countries in Asia. Around 70% of all Swedish textile and apparel companies are located in the industry district around Borås and Sjuhäradsbygden[8].

6 Jonas Larsson, Lecturer, Swedish school of textiles, University of Borås, Interviewed on the 3d of March, 2015

[7] Rudrjajeet Pal, Lecturer in textile management, Swedish School of Textiles, University of Borås, Interviewed on the 4th of March, 2015

[8] Elin Lyhdal, General Secretary, Sveriges Textil och Modeföretag, Interviewed on the 11th of March, 2015.

The main part of the textile and apparel production within EU is concentrated to Italy, Spain, Portugal and other countries in Western Europe (Puig et al., 2008), but some production is also performed in the Baltic countries and the central parts of Europe.

Countries outside EU in the Eastern parts of Europe, including Turkey, have some established textile and apparel production[9]. Eastern Europe holds several low-cost countries, such as Romania and Bulgaria, where wages are low enough to compete with established textile-producing countries in Asia. The eastern countries including Turkey are by many companies considered attractive since they are close to the European market[10]. Turkey is predicted to be one of the fastest growing markets in the near future (Just-style, 2012).

3.4.3. Africa

Africa is a yet fairly non-established continent when it comes to textile and apparel production, but it is a continent where changes might be seen in the coming years[11] (Ganguli, 2014; Chao & Lu, 2015). Some large actors, such as H&M and Benetton, have already started establishing production in North Africa (Hartman et al., 2011), which usually is explained by the desire to shorten product life cycles. Ethiopa, Egypt and Morocco are some of the countries were production has been predicted to increase (Ganguli, 2014; Chao & Lu, 2015).

3.4.4. Division of the geographic areas

The division of areas that were used in this study are listed in the table 11 below. Some countries are treated individually while others are included in geographical regions; this division was based on literature and preliminary interviews.

Table 11: Divisions within Europe and Asia

Continent	Area	Description
Europe	**Sweden**	
	Other Nordic Countries	Norway, Denmark, Finland, Iceland
	Baltics	Estonia, Latvia, Lithuania
	Western Europe	Germany, Austria, Switzerland, Italia and other EU countries in the west
	Central Europe	Poland, Czech Republic, Slovakia, Hungary and other EU countries in the east
	Eastern Europe (outside EU)	Belarus, Ukraine, Russia and Turkey
Asia	**China**	
	India	
	Bangladesh	

[9] Elin Lyhdal, General Secretary, Sveriges Textil och Modeföretag, Interviewed on the 11th of March, 2015.
[10] Elin Lyhdal, General Secretary, Sveriges Textil och Modeföretag, Interviewed on the 11th of March, 2015.
[11] Elin Lyhdal, General Secretary, Sveriges Textil och Modeföretag, Interviewed on the 11th of March, 2015.

	Vietnam	
	South Korea	
	Taiwan	
	Pakistan	
	Other Asian Countries	Cambodia, Indonesia, Philippines etc.

3.5. Conceptual model

This section describes the conceptual model that served as a basis for the research.

3.5.1. Location decisions

Porter (1986) divided purchasing and sourcing strategies into two interconnected dimensions, *configuration* and *coordination*. Configuration is the main concern of this study and is referring to "*where in the world each activity in the value chain is performed*" (Porter, 1986, p. 17). Coordination both affects and is dependent on the configuration, which refers to "*how like activities performed in different countries are coordinated with each other*" (Porter, 1986, p. 17).

Configuration or location decisions need to be taken with consideration of coordination issues but based on location-specific factors (Meijbom & Vos, 1997). The location-specific factors are in this report defined as external factors. Since location decisions will have an effect on lead-times and quality, it is also important to consider internal factors such as company characteristics and product characteristics.

Location decisions are sometimes overlooked even though they are of strategic importance (Porter, 1986; Hartman, 2011) and the driver behind location decisions should be the strategic goals, or the desired capabilities, that the company wants to achieve.

3.5.2. Internal factors

Internal factors are in this context defined as factors that lie within the company's control. These factors are divided into product characteristics and company characteristics. The supply chain strategy should be adapted to these factors in several ways.

3.5.2.1. Company characteristics

How important it is with closeness between production facilities and other business functions and the market differs between different companies, but it will have an effect on production location. Proximity to market is considered very important for some companies but not for others (Jin & Farr, 2010).

Company size is usually mentioned as a determinant in the decision to source globally and it is likely to affect the ability to source globally (Åkesson et al., 2007; Swoboda et al., 2008).

The types of textile product a company offers will affect the needs and the capabilities of the company, and it can therefore be considered an important company characteristic. The different products have for example different market characteristics and different

technical needs. The company characteristics considered in this study can be found in table 12 below.

Table 12: Company characteristics

Company characteristic	Description
Company size	Company size can be measured in several ways, for example in number of employees, number of facilities or turnover.
Type of textile company	According to the Swedish industry association TEKO, the three main types of textile companies can be defined based on type of main product; interior textiles, technical textiles and fashion and apparel companies.
Type of Customer	The type of customer is in this case referring to whether the company is producing products for consumers, companies or government agencies.
Position in the value chain	Whether a company produces itself or not, and where its position is in the value chain.
Importance of closeness between facilities	Different companies might have different need of closeness between production and other facilities or the customer market.

3.5.2.2. Product characteristics

The supply chain strategy should be adapted to the product type (Kraljic, 1983; Fisher, 1997; Christopher et al., 2006; Hartman et al., 2011). There are many different approaches to this but they include similar dimensions. Fisher includes factors such as product life cycle, product variety and lead-time as important aspects of the demand on the product and distinguishes between functional and innovative products (Fisher, 1997). Kraljic proposes in his well-known purchasing portfolio (1983) that differentiation should be done between different products depending on the supply risk and the impact on financial results (Kraljic, 1983). These frameworks have some resemblance with the framework proposed by Christopher et al. (2006), where the product is defined either as special or standard (similar to Fisher's functional or innovative products). Special products have shorter life cycles, more unpredictable demand and are produced in smaller volumes. Standard products have the opposite characteristics; they have longer life cycles, more stable demand and are usually produced in larger volumes (Christopher et al., 2006). The focus for standard products should lie on being resource effective, or efficient, and for special products the main focus should be to be responsive (Fisher, 1997; Christopher et al., 2006).

It is crucial to consider the type of product when taking decision regarding where to produce, since it affects the required lead times, the need for communication and to what degree flexibility is needed (Hartman et al, 2011; van Weele, 2014). Special products are more suitable for local production whereas global production is more suitable for standard products, but these are only general recommendations and individual decisions should be taken for each product (van Weele, 2014).

Another important aspect of product characteristics is the competitive elements - or in other words, how value is created. Value for customers can be created in different ways and it is closely related to the broad concept of quality. Garvin's divides the quality concept into eight dimensions; namely features, performance, reliability, conformance,

durability, serviceability, aesthetics and perceived quality (Garvin, 1987). Similar dimensions were listed specifically for apparel products by Rayman et al. (2012); performance, components (similar to features), garment care, workmanship, style and fit (Rayman et al., 2012). Andersson & Segerdahl (2012) list five different competitive elements, namely high service, design, innovation, low price and strong brand (Andersson & Segerdahl, 2012).

The product characteristics considered in this study are listed in table 13 below.

Table 13: Product characteristics

Product characteristic	Description
Life cycle length	The product life cycle length describes the time from first design to the stage when it has become obsolete.
Competitive elements	The competitive elements describe how a company creates value for its customers.

3.5.3. External factors

External factors are in this report defined as factors in the external business environment that companies take into consideration when taking decisions on where to locate production. These are factors that companies cannot affect themselves, but that affects their decisions. How important each external factor is for a specific company is dependent on internal factors, such as product and company characteristics, and the desired capabilities. The importance of external factors also differs between different locations (Meyer, 2008).

The PESTEL (Political, Economic, Social, Technical, Environmental and Legal factors) framework can be used for analysis of the external environment (McKeller, 2014). The PESTEL framework is used in order to structure the different external factors, grouping them into Political, Economic, Social, Technical, Environmental and Legal factors. In this study, however, "Legal factors" are changed to "Logistical factors" in order to better fit the purpose. All external factors considered in this study are presented in figure 3.

3.5.3.1. Political factors

Political factors can have substantial effect on location decisions (Cho & Kang, 2000; Swoboda et al., 2008). The political factors can be for example trade barriers, laws or but also political stability and risk for war (McKeller, 2014).

Trade barriers can be of different nature, such as taxes, custom duties and quotas (Meyer 2008). Historically quotas and other types of market regulations, such as the Multi-Fibre Arrangement (MFA) and the Agreement on Textile and Clothing, have had big impact on the textile and apparel industry (Shelton & Wachter, 2005). The MFA, initiated in 1974, was an arrangement of quota systems with the purpose of limiting the amount of imported goods from development countries (Shelton & Wachter, 2005). The ATC, ended in 2005, was imposed by the former General Agreement on Tariffs and Trade (which was eventually replaced by the World Trade Organization, WTO) in order to phase out the quota system and it had a large impact on the global production networks since it allowed textile and apparel companies in developed countries to once again freely import from development countries (Shelton & Wachter, 2005). The out-phasing of the quota systems have allowed for development countries with low wages

to gain a large part of the global market shares (Shelton & Wachter, 2005). Even though the quota system no longer exists, tariffs, customs and trade agreements have effects on sourcing locations (McKeller, 2014). The risk of war and political instability is another external factor that affects location decisions (Swoboda et al., 2008; Meyer, 2008; McKeller, 2014).

3.5.3.2. Economic factors

Economic factors are often considered one of the main drivers behind decisions to source globally (Cook, 2007; Swoboda et al., 2008), but the direct cost benefits (such as manufacturing costs) alone are not sufficient for motivating these decisions and companies need to consider several factors when it comes to cost (Lowson, 2003; Christopher et al., 2004; Åkesson et al. 2007; Jin & Farr, 2010).

Meyer (2008) lists several economic factors that can affect site location, divided into location parameters and process parameters. Labour cost, cost of capital and cost of materials are mentioned as factors associated with the location that needs to be taken into account (Meyer, 2008; Swoboda et al., 2008). The transportation cost is another factor that is naturally associated with the distance to the location, but it is also affected by distribution cost and other associated costs (Meyer, 2008).

There are several financial risks that can affect location decisions (McKeller, 2014), but one risk that is specifically associated with offshore sourcing is the risk of currency fluctuations (Swoboda et al., 2008; Jin & Farr, 2010).

Production of textiles requires a vast amount of water and energy (Edström et al., 2013), resources that usually have a low price in many of the largest producing countries. However, China is in 2015 facing a serious water-crisis and in order to slow down the water consumption higher water prices were recently introduced in Beijing (Reuters, 2014; Spegele & Kazer, 2014). The higher water prices are predicted to have a large impact on industrial consumers (China Water Risk, 2014) and could be an important factor to consider in the future, together with prices for electricity, in other locations as well[12].

3.5.3.3. Social factors

Social factors include issues such as Corporate Social Responsibility (CSR) but also cultural differences and relationships with suppliers.

CSR is an organizational commitment that integrates environmental, social and ethical interests into business decisions (McKeller, 2014). CSR should include all stakeholders and not only clients, but also the suppliers and the local communities and employees (McKeller, 2014). One important part of the social responsibility is ensuring good working conditions in the factories (McKeller, 2014) and work safety needs to be considered (Cook, 2007; Meyer, 2008). The textile and apparel industry, especially the fashion sector, has seen many cases were the ability to control this has resulted in fatal accidents killing numerous people, which also has resulted in extensive negative publicity (d'Ambrogio, 2014).

[12] Jonas Larsson, Lecturer, Swedish School of Textiles, University of Borås, Interviewed on the 3d of March, 2015

Cultural differences are a common challenge when it comes to global sourcing, and cultural similarities therefor a commonly applied decision factor (Jin & Farr, 2010). Cultural factors include for example languages, business norms and ethical norms (Kotabe & Mudambi, 2009; McKeller, 2014). The cultural differences can complicate relationships with suppliers and affect lead times and production schedules (McKeller, 2014).

Availability of personnel with the right competence is a key decision factor for many textile and apparel companies and it is common that textile and apparel companies form close relationship with suppliers (Bruce et al. 2004). The fact that other companies in the industry, from the same country, are producing in the same area is for some companies an important decision factor[13].

3.5.3.4. Technical factors

Technical factors include factors that are related to the production process of the product. Know-how and the right equipment are important factors in this group since they have an effect on the productivity (Meyer, 2008; Swoboda et al., 2008).

3.5.3.5. Environmental factors

The textile and apparel industry has generally a large negative impact on the environment, due to water and energy consumption and the extensive use of chemicals in production (Edström, 2013). Environmental guidelines and requirements differ significantly between different countries and regions, which is important to be aware of (Meyer, 2008). It is not uncommon that Swedish textile companies locate production in countries where the regulations are less hard than in Sweden[14] (Edström et al., 2013). The reason for this is usually of economic nature, and it would simply be too costly to produce some environmentally wearing products in Sweden.

The risk of natural disasters, such as earthquakes and floods, is present in several locations and can have large impacts on the supply chain (McKeller, 2014).

3.5.3.6. Logistical factors

Infrastructure needs to be taken into consideration, especially in development countries, since it can have large effects on productivity and might cause extensive costs (Meyer, 2008; Kotabe & Mudambi, 2009). Transportation time between production and market is another factor that should be taken into consideration (Swoboda et al., 2008)

[13] Jonas Larsson, Lecturer, Swedish School of Textiles, University of Borås, Interviewed on the 3d of March, 2015

[14] Elin Lyhdal, General Secretary, Sveriges Textil och Modeföretag, Interviewed on the 11th of March 2015.

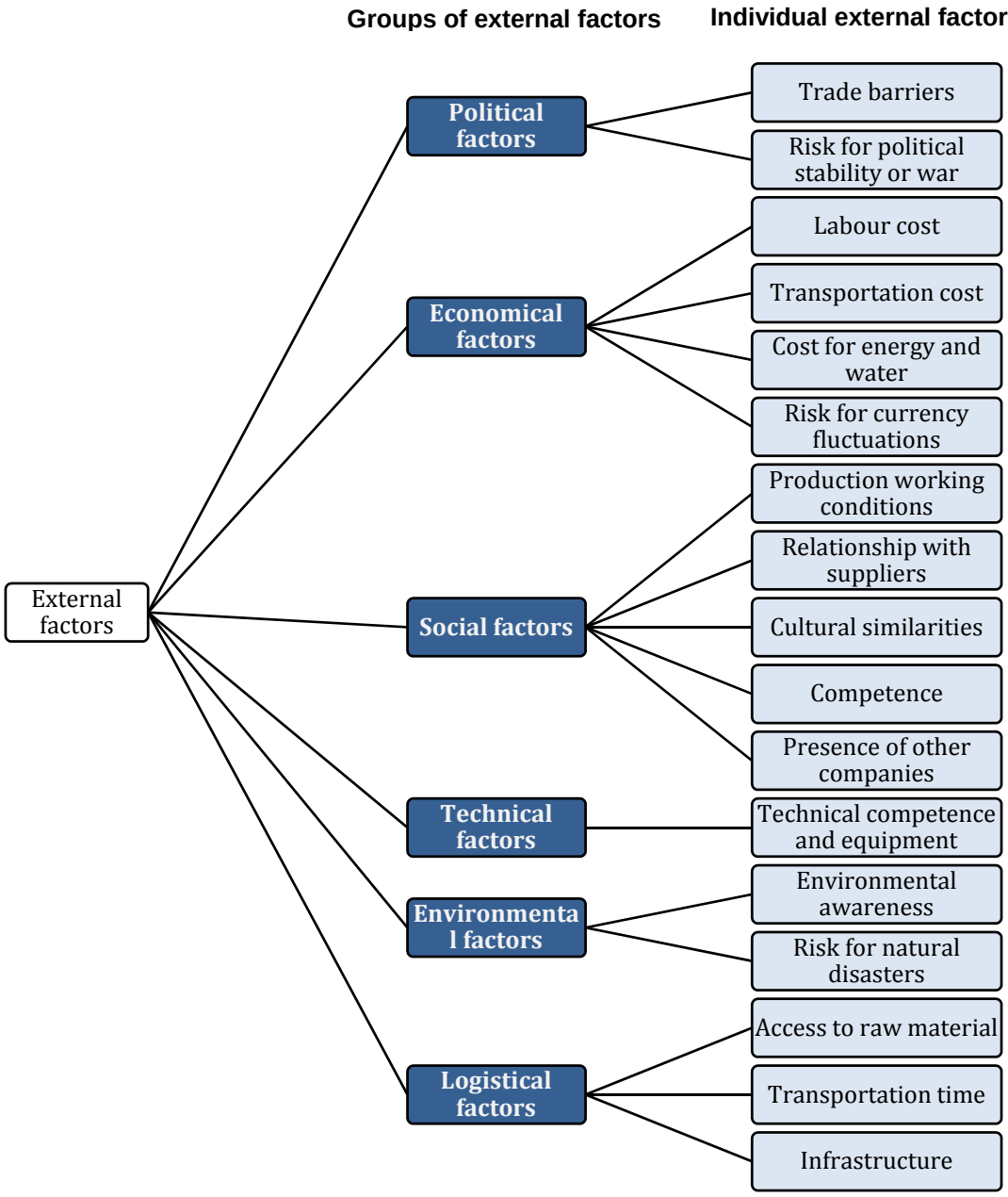

Figure 3: External factors, divided into groups of external factors and the individual external factors

3.5.4. Desired capabilities

Desired capabilities refer to the strategic goals that companies want to achieve in production and delivery of its products. Depending on the overall business goals, different desired capabilities might be sought (Åkesson et al., 2007; McKeller, 2014) that will affect the production location (Swoboda et al., 2008). For example achieving cost benefits alone does usually not suffer in order to stay competitive, but a trade-off between cost and flexibility or speed might be needed (Hartman et al., 2011). In the theoretic framework of this study, the purpose was to try to capture how the different desired capabilities could be grouped. Some of the literature describes how to measure performance and other is regarding different strategies for supply chain management.

Achieving low cost (Neely et al. 1995; Beamon 1999; Meijbom & Vos, 1997; Kim, 2013) and high quality (Kim, 2013; Neely et al.,1995; Leong et al., 1990; Meijbom &

Vos, 1997) are possible desired capabilities for supply chains and they are commonly applied performance indicators (Leong et al. 1990; Anupam, 2015).

Flexibility is another important aspect of supply chain capability or performance (Leong et al., 1990; Neely et al., 1995, Beamon, 1999; Gary Teng & Jamarillo, 2005; Kim, 2013; McKeller, 2014). Since the textile and apparel industry is characterised by uncertainty, dynamic customer requirements and tough competition - flexibility has become an important part of staying competitive (Källa.). Flexibility is also mentioned as a key dimension of manufacturing performance (Leong et al., 1990). Upton (1994) makes a distinction between internal and external flexibility and the two dimensions involve different requirements. External flexibility means adapting to external requirements, such as changes in market demands, customization or opportunities to broaden a product line (Upton, 1994). The ability to respond quickly to changes in customer demand is one important dimension of external flexibility and an important part of supply chain performance (Anupam, 2015). Internal flexibility on the other hand is not something that the market would perceive as flexibility but instead includes capabilities such as switching from one raw material to another at a production plant in order to achieve lower costs (Upton, 1994). The internal flexibility is related to individual manufacturers' capabilities, while the external flexibility is to a higher extent affected by the location characteristics.

Time has become an increasingly important part of staying competitive and speed is one possible strategic goal of supply chain management (McKeller, 2014). The time factor has many different components, for example manufacturing lead-times, time-to-market or transportation time (Neely et al, 1996; Gary Teng & Jamarillo, 2005; Christopher et al., 2006; Anupam, 2015; Hartman et al., 2011), and it affects the ability of being responsive (Beamon, 1999; Hartman et al., 2011; Anupam, 2015) and agile (McKeller, 2014). The time aspect is generally considered particularly important in the fashion industry where forecasting is diffictult due to constantly changing market demand (Christpher et al., 2004). Long lead-times can lead to manufacturing of products are obsolete by the time they reach the store.

The time aspect is closely related to delivery reliability or delivery dependability that is measured in order to derive the performance of the supply chain (Leong et al., 1990; Meijbom & Vos, 1997 Gary Teng & Jamarillo, 2005). In can be measured in for example number of on-time deliveries, stock-out probability and number of late orders (Anupam, 2015).

Based on literature, the categorisation of desired capabilities listed in table 14 below was created.

Table 14: Desired capabilities

Desired capability	Terminology / Measurements
Low cost	Low cost of the overall supply chain activities, manufacturing costs, distribution costs etc.
High quality	High quality of the delivered products according to specifications
High flexibility towards customers	Describes the external dimension of flexibility and includes the ability to respond to customer and customer responsiveness,
Short time from product idea to production start	Describes the time it takes to start production once the concept have been developed
Short time from order to market	The time from order until its available for the customer
High delivery reliability	Delivery reliability means that the right quantity, is delivered in the right quality at the right time

It is not possible to achieve all of these capabilities at the same time, but companies will need to make trade-offs between them.

3.6. Conceptual model

Based on theory framework the conceptual model shown in figure 4 was developed. Production location decisions are directly affected by external factors and desired capabilities. The desired capabilities are affected by the internal factors. The type of product and type of company form the desired capabilities in a strategic sense but also in terms of what is actually possible to achieve.

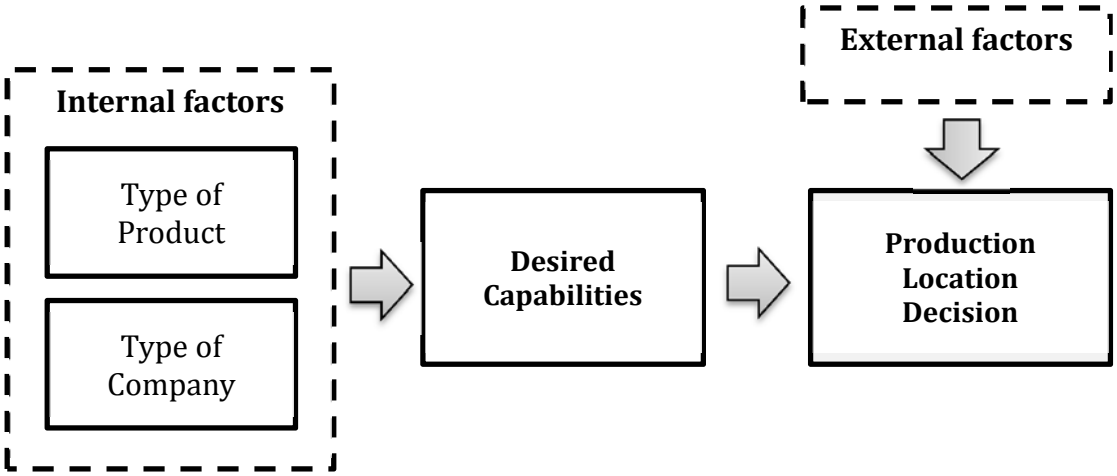

Figure 4: Conceptual Model

The conceptual model served as a basis for the research and especially for the development of the survey.

4. Results

This section contains all relevant results from the study, which includes findings from the survey responses as well as thoughts and opinions from the interviewed participants.

This section consists of three parts. The first part, Internal factors, includes a presentation of the sample, such as company and product characteristics of the respondents. The second part presents the situation in the world today, where Swedish textile and Apparel companies produce and what desired capabilities and external factors that they find important. The last part describes the predicted future, where Swedish textile and Apparel companies plan to produce in 2025 and what desired capabilities, internal as well as external factors that will increase in importance. Both part two and part three also examine how company and product characteristics, desired capabilities and external factors affect the decisions regarding production location.

When the word "presence" is used in this section it is referring to when companies have some part of the production in the specified area or country, and it includes both outsourced activities and purchased goods.

The statistical analyses that laid ground for the results can be found in the appendices D, E, F and G.

4.1. Internal factors

In order to get an understanding of the respondents' company and product characteristics and to get a general view of the whole sample, all respondent demographics were analysed in a descriptive analysis.

4.1.1. Company characteristics

The distribution between the type of companies based on the main product, Fashion & Apparel, Technical Textiles and Interior Textiles, is presented in figure 5 below. Two thirds of the companies were Fashion and Apparel companies, 20% were Technical textile companies and Interior textile companies stood for 14%.

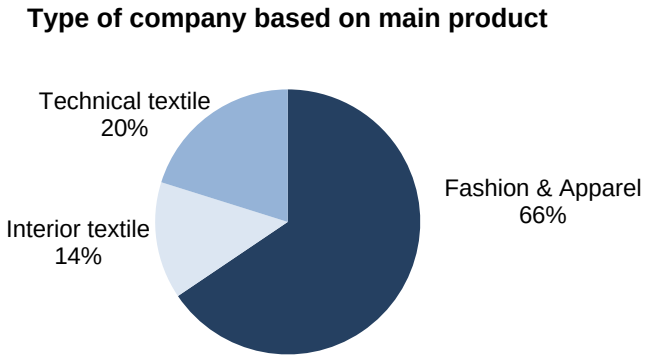

Figure 5: Distribution of company type within the sample

The size of the companies were in this study measured in turnover. In the survey the respondents were asked about their companies turnover, and they could choose between five intervals. That classification is defined as Company size A and the result is presented in figure 6. With the aim to get a clearer overview of the samples company

size, the companies were divided into small to medium sized companies or large sized companies depending on the size of their turnover. Large companies refers to companies with a annual turnover greater than 100 million SEK, while Small to Medium sized companies are those with a turnover smaller than 100 million SEK per year. The distribution between Large sized companies and Small to Medium sized companies is 53% and 47%., as shown in figure 7.

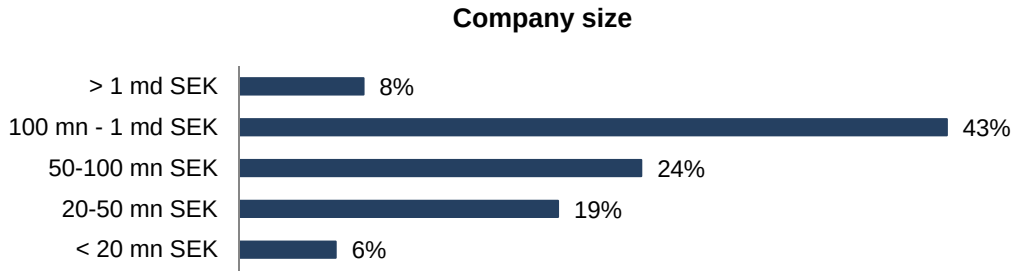

Figure 6: Distribution of company size within the sample

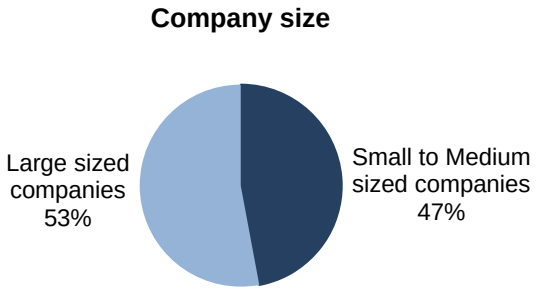

Figure 7: Distribution of company size within the sample

The distribution between these groups in the sample was 54% Large companies and 46% Small to Medium sized companies.

Figure 8 shows the distribution of the responding persons' position within the company. Half of the responding persons were CEOs and a third were Vice Presidents, Purchasing Managers or Production Managers. The share of positions named "Others", that stands for 17% of the respondents, includes buyers and managers within areas such as Supply Chain, Product Development and other relevant areas.

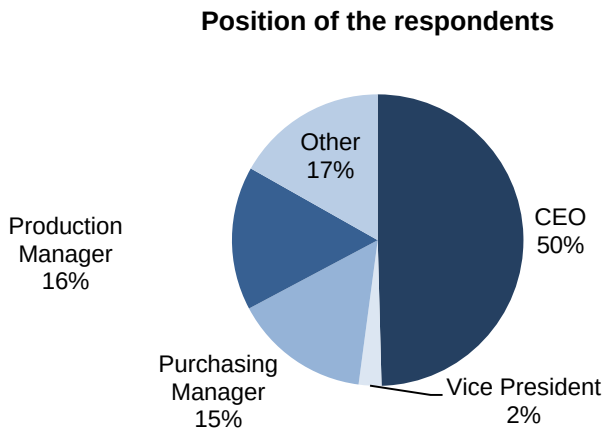

Figure 8: Distribution of respondents' positions

Main customers were in this study divided into three groups. The distribution between the groups is presented in figure 9. The biggest group of main customers were Companies, 62%, and Consumers were the second biggest group, 36%. Only 2% of the respondents had Government agencies as their main customers.

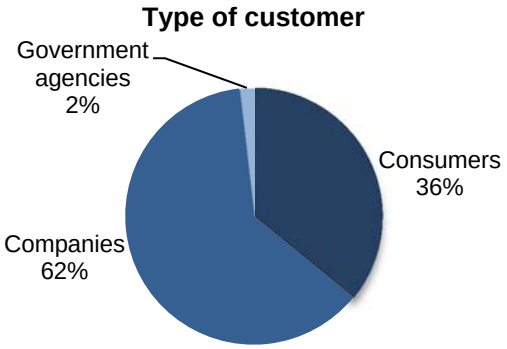

Figure 9: Distribution of the companies' main customers

The respondents were asked if they have any production in-house, manufacturing companies, or if an external actor produces their products, retail companies. The distribution between manufacturer and retailers was 53% to 47%, as shown in figure 10.

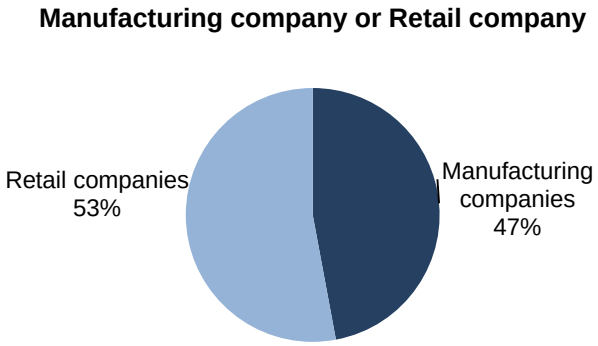

Figure 10: Distribution of manufactures and retailers

With the aim to find out whether the company takes into account the distance to the production when making decisions regarding location of production, the respondents were asked about the importance of geographical closeness between production and different units. The examined units were Market, Headquarter, Warehouse, Design & Product development and Research & Development. According to figure 11, there is no clear tendency showing that it is very important with closeness between production and any of the units. The distribution between the four rankings options, from *Not important at all* to *Very important*, was fairly even for all units. About 20-30% of the respondents had ranked the importance of closeness between the production and the different units as less important, important or very important for all units.

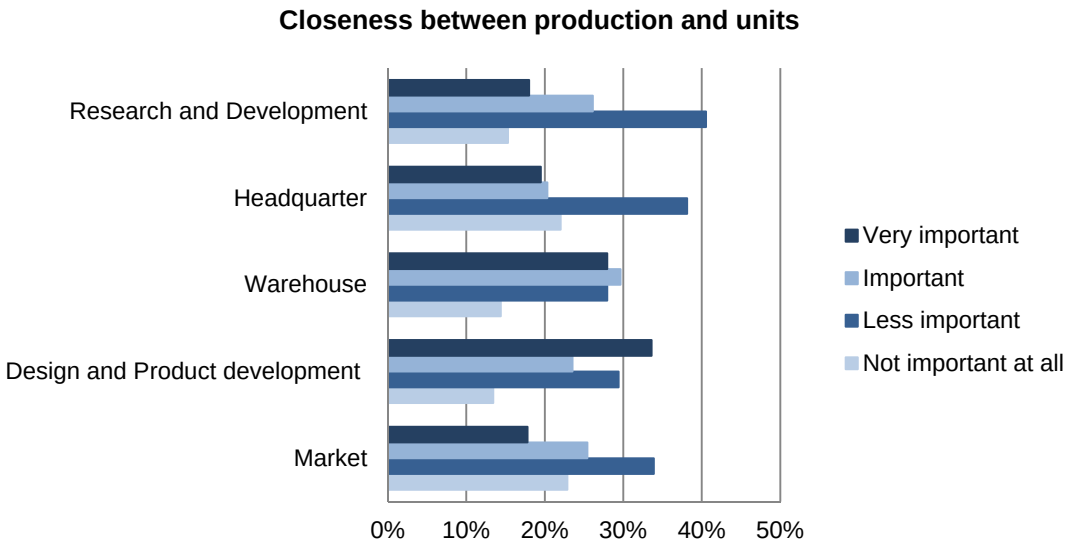

Figure 11: Closeness between production and units

Figure 12 presents the distribution of how many times the responding companies have moved parts of or all their production the last five years. About 40% of the respondents have moved their production up to five times during the recent years, and more than 20% had moved their production more than five times.

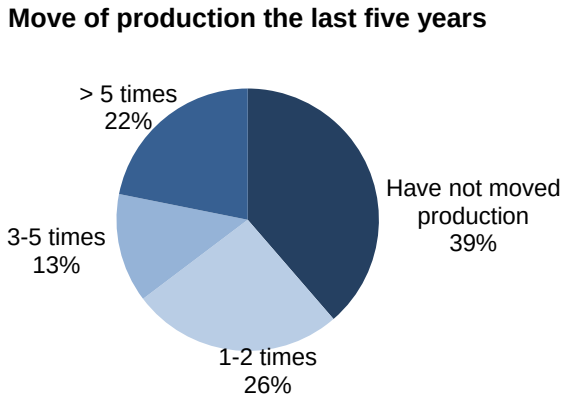

Figure 12: Number of production moves the last five years

4.1.2. Product characteristics

Figure 13 shows that most of the companies have a life cycle longer than 12 months for their main product. A bit more than 30% had a product life cycle that is one to 12 months, but only 2% of the respondents' main product has a life cycle shorter than one month.

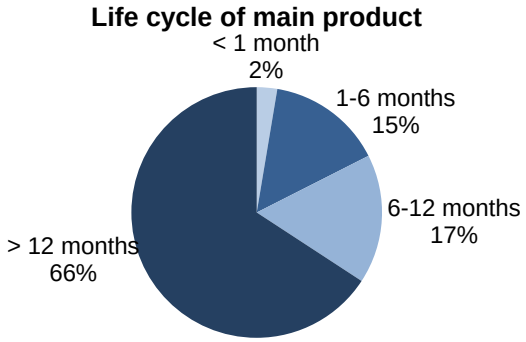

Figure 13: Distribution of the main product's life cycle within the sample

With the aim of understanding the responding companies' products and how they compete with their product on the market, the respondents were asked to choose one of five competitive elements that best describes how they create value for their customers. The two most commonly adapted competitive elements are High quality and High service. The distribution between the competitive elements is presented in figure 14 below.

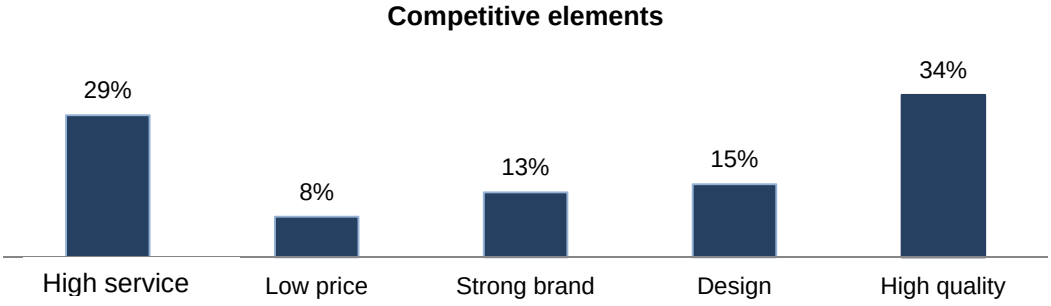

Figure 14: Competitive elements

4.2. Global production today

This section provides a description of the production in the world today. Firstly, the desired capabilities that companies want to achieve when producing and delivering the products are presented. Secondly, the external factors that are taken into account when locating production and how important the companies believe that they are described. Lastly a description of the distribution of the companies' production in the world continents and different countries today is provided.

The production share is presented in terms of Presence of companies and Average production share. The percentage of companies present is referring to the proportion of all respondents that have some part of their production located in that continent or country. The Average production share for a continent or country describes the average share of the respondents' total production that is located there.

4.2.1. Desired capabilities

With the aim to investigate what desired capabilities that companies strive to achieve in production and delivery of their products today, the respondents were asked to choose two of their most important desired capabilities. The share of companies that chose each desired capability is shown in figure 15 below.

High delivery reliability was the most commonly chosen desired capability, followed by High quality. The desired capabilities that were least frequently chosen were Short time for delivery to market and Short time from idea to production.

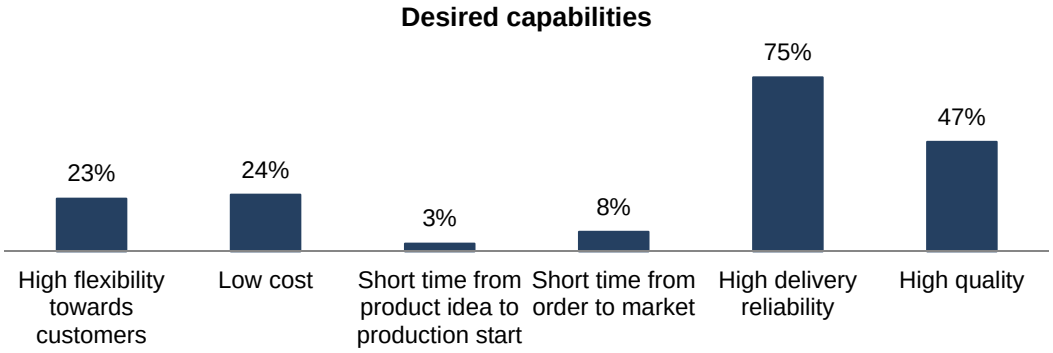

Figure 15: Desired capabilities 2015

4.2.2. Importance of external factors

To find out what external factors that companies take into consideration when choosing location for production, the importance of external factors were examined. The external factors were divided into four different groups; Economic factors, Social factors, Logistical and Technical factors and Environmental and Political factors and each group of contained a set of individual factors. After rating the importance of each individual factor, the respondents were asked to rank the importance of each group of external factors from one to four, where one was the most important and four was the least important. When the average importance for each group of external factors was calculated, the group rated as most important received four points, the second most important received two points, and so on. The average scores for each group of external factors are presented in figure 16 below.

The group of external factors that is considered most important is the Economical factors with an average score of 3,24. Social factors are the second most important external factors with an average score of 2,61 followed by Logistical and Technical factors with a corresponding value of 2,46. Environmental and Political factors are ranked as the least important group of external factors with an average of 1,61.

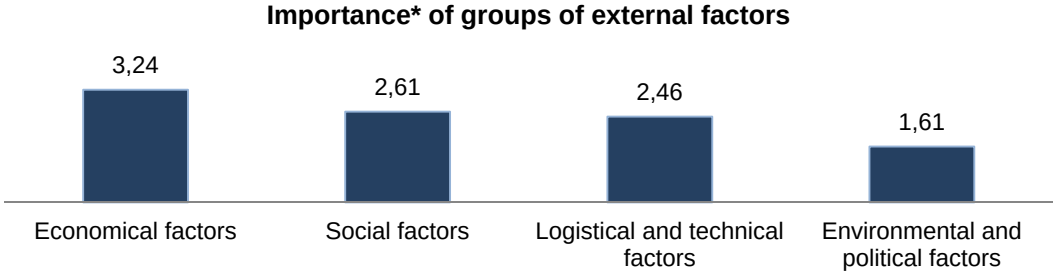

Figure 16: Importance of groups of external factors 2015
***Average importance for the sample on the scale 1-4, were 1=Low importance and 4=High importance**

The external factors within each external factor group were individually graded on a four-point scale ranging from Not important at all to Very important. All external factors and the average ranking for each of them are presented in figure 17.

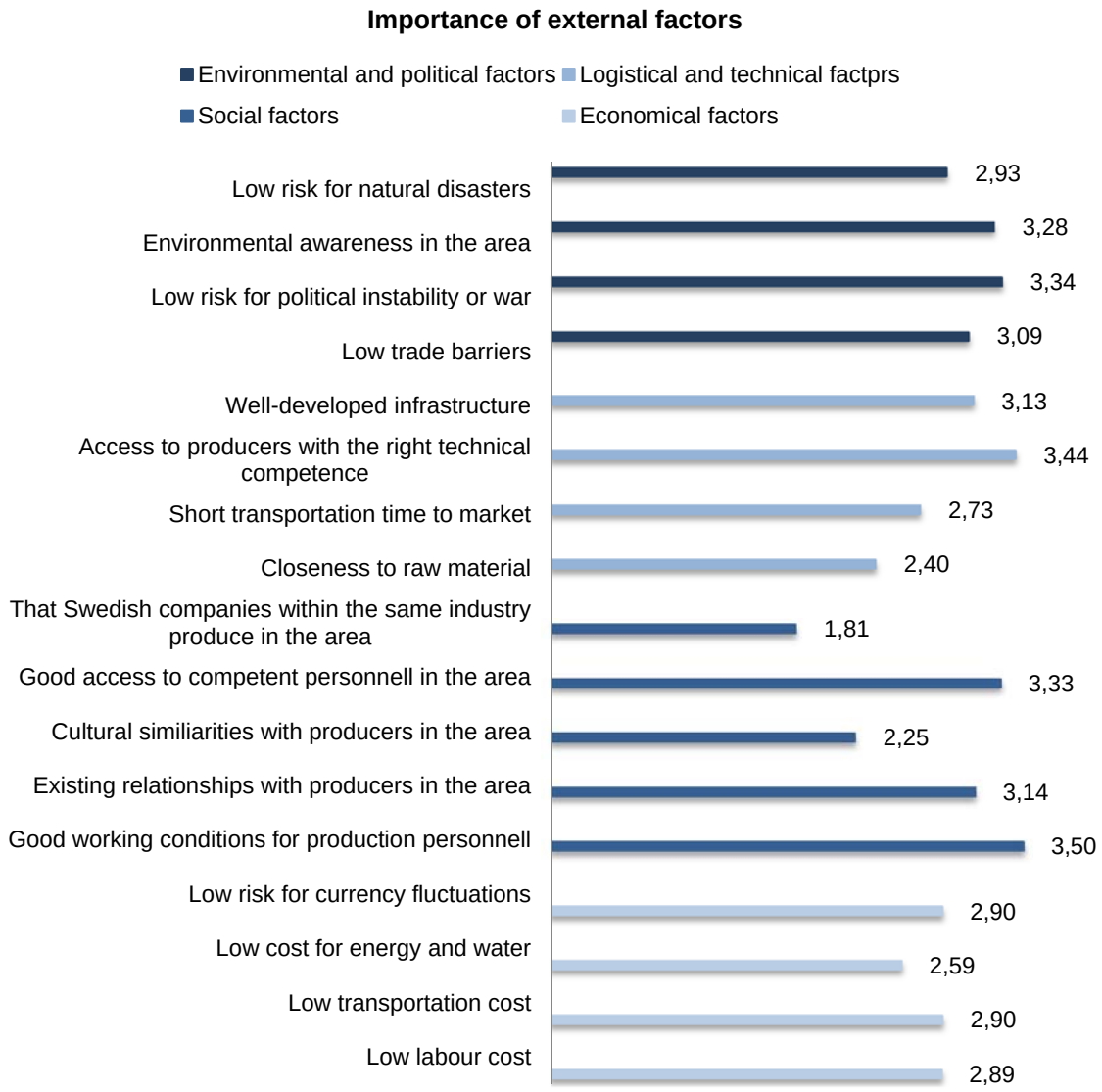

Figure 17: Importance of external factors 2015
***Average importance for the sample on the scale 1-4**

The external factor that received an average score higher than 3, and hence received an average value that corresponded to Important, were the following factors:

- Good working conditions for production personnel
- Access to producers with the right technical competence
- Low risk for political instability or war
- Good access to competence in the area
- Environmental awareness in the area
- Existing relationships with producers in the area
- Well-developed infrastructure in the area
- Low trade barriers

The external factors that received the lowest scores were That Swedish companies produce within the same area and Cultural similarities with producers in the area.

The importance of competence, good working conditions and the relationships with suppliers in the area were confirmed during all of the interviews [15][16][17][19][20]. The access to competence is often considered a crucial factor in decisions regarding production location[21][22][23][24][25]. Existing relationships with suppliers is another decisive factors, and building long-term relationships is often considered very important[26][27][28][29][30]. That the infrastructure is well developed and that trade barriers are low are usually considered as prerequisites in order to produce in an area[31][32].

4.2.2.1. Relationships between internal and external factors

The statistical analysis showed significant differences for the importance of three of the external factors between different internal factors. Firstly, there is a significant difference ($p<0,05$) for the considered importance of the external factor Good access to competence in the area between Fashion and Apparel companies and Interior textile companies. Fashion and Apparel companies consider it significant more important than Interior textile companies and mean difference between the groups were 0,4. Secondly, companies with a turnover within the span 50-100 million SEK value Cultural similarities with producers in the area more than companies with a turnover higher than one billion SEK. The statistical analysis showed mean difference of 0,7 between the groups. Another significant difference was identified for the importance of Good working conditions for the production workers between the product characteristics in terms of customers. The statistical test showed that companies that have consumers as their main customers rank Good working conditions significantly higher than companies that have other companies as their main customers. The mean difference between the groups is 0,3.

4.2.3. Production in the world continents today

Today the majority of the Swedish textile and Apparel companies' production is located in Europe and Asia. Approximately 85% of the companies have some part of their production in Europe and the average production share in Europe is 10-30%. 75% of the respondents have some part of their production in Asia and the average production share for a company within the sample on the Asian continent is 10-30%. Africa, North

[15] Production Manager, Company E, Interviewed on the 5th of June, 2015
[16] CEO, Company D, Interviewed on the 1st of June, 2015
[17] CEO, Company B, Interviewed on the 29th of May, 2015
[18] Supply Chain Director, Company A, Interviewed on the 28th of May, 2015
[19] Design and Product development director, Company C, Interviewed on the 1st of June, 2015
[20] Development and sourcing manager, Company F, Interviewed on the 10th of June, 2015
[21] Supply Chain Director, Company A, Interviewed on the 28th of May, 2015
[22] Design and Product development director, Company C, Interviewed on the 1st of June, 2015
[23] CEO, Company D, Interviewed on the 1st of June, 2015
[24] Production Manager, Company E, Interviewed on the 5th of June, 2015
[25] Development and sourcing manager, Company F, Interviewed on the 10th of June, 2015
[26] Production Manager, Company E, Interviewed on the 5th of June, 2015
[27] CEO, Company D, Interviewed on the 1st of June, 2015
[28] Design and Product development director, Company C, Interviewed on the 1st of June, 2015
[29] CEO, Company B, Interviewed on the 29th of May, 2015
[30] Supply Chain Director, Company A, Interviewed on the 28th of May, 2015
[31] Supply Chain Director, Company A, Interviewed on the 28th of May, 2015
[32] CEO, Company B, Interviewed on the 29th of May, 2015

and South America and Oceania all have low presence of the companies in the sample and the average production share in these three continents can be assumed to zero. The distribution of presence of companies in the world continents as well as the average production share within the continents can be found in figure 18.

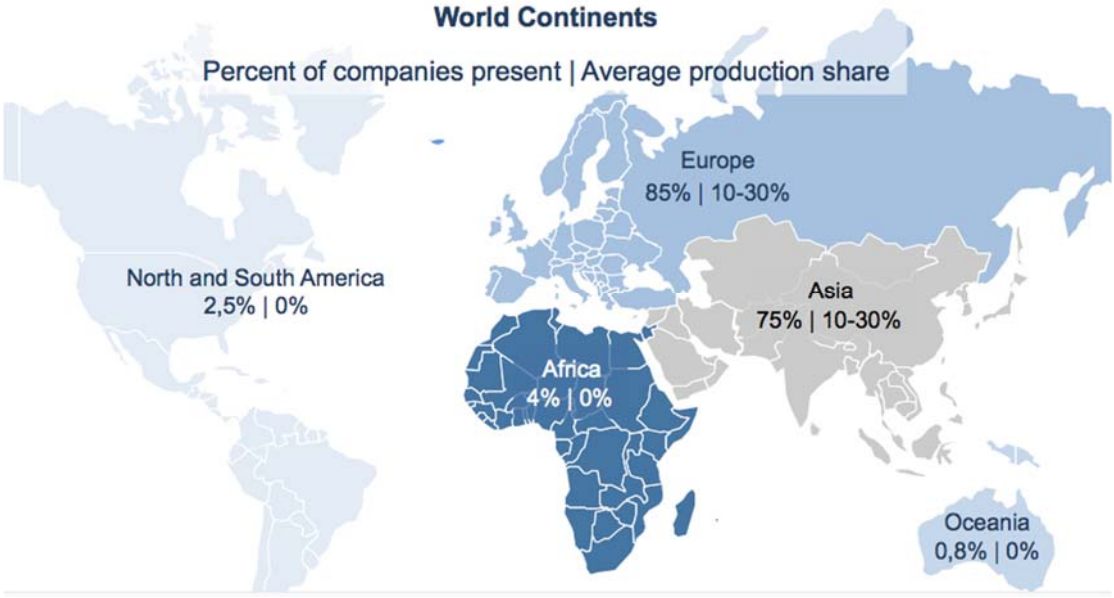

Figure 18: Production in the world continents 2015

Seen to the estimated share of the total production of Swedish textile and apparel companies, the production is evenly distributed between Europe and Asia, as shown in figure 19 below.

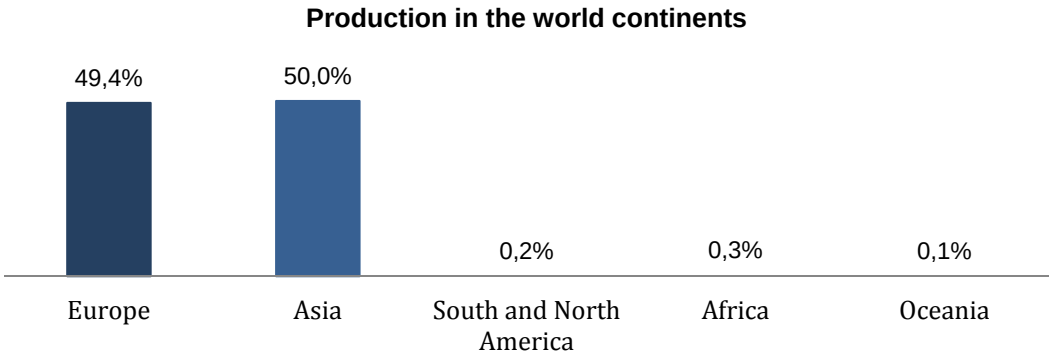

Figure 19: Production in the world continents 2015

4.2.3.1. Production in Europe today

The statistical tests showed some significant differences in where the companies produce based on their internal factors.

A significant difference was identified between the types of companies and their production share in Europe. Interior textile companies have the highest share in with a mean 30-50% of the total of production. Fashion and Apparel companies and Technical textile companies have a mean of 10-30% of production in Europe.

The statistical tests that compared the different sizes of companies showed that companies with a turnover less than 50 million SEK to a greater extent have larger

production share in Europe than larger companies. Their median share of production is more than 50%.

Lastly there is a significant difference between manufactures and retailers and the share of production in Europe. Companies that are manufacturers and own parts of their production have higher production share, in several cases more than 50%, in Europe, than companies that do not own their production.

To conclude, three factors seem to affect the share of production in the European continent:

- Type of textile product
- Size of the company
- Manufacturing or retail company

Figure 20 below shows the distribution of production between the different areas within Europe. Sweden and the Baltic countries stand for the largest share of production, but the distribution between the different areas is even, with the exception of the Nordic countries besides Sweden, which is also the smallest group in this categorisation. Almost all Interior companies and almost all Technical textile companies have production in Europe and 80% of the Fashion and Apparel companies have production in Europe.

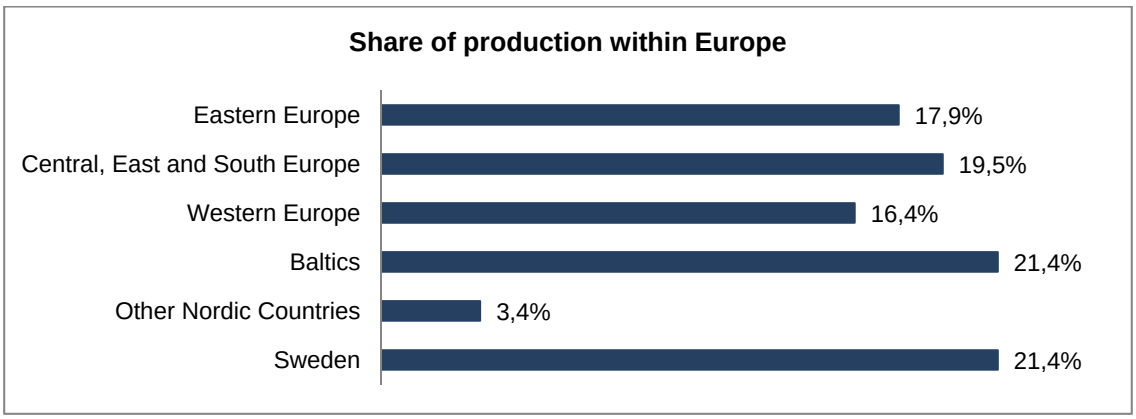

Figure 20: Share of production within Europe 2015

Seen to presence, Sweden and the Baltics are the parts of Europe were most of the respondents have production today, as shown in the map in figure 21. Approximately 30% of all companies have production in Sweden and the same number is valid for the Baltics. The average production share is between 10-30% in these areas. Eastern Europe (outside EU) & Turkey, Central Europe and Western Europe are also other areas that stand for a large proportion of the Swedish textile and apparel companies' products, and more than 20% of the respondents have production in each of these areas. The average share of production among all companies is in these areas lower that 10%, which is lower than for Sweden and the Baltics. In the Other Nordic Countries around 5% of the sample has production, but the average production share is almost non-existent.

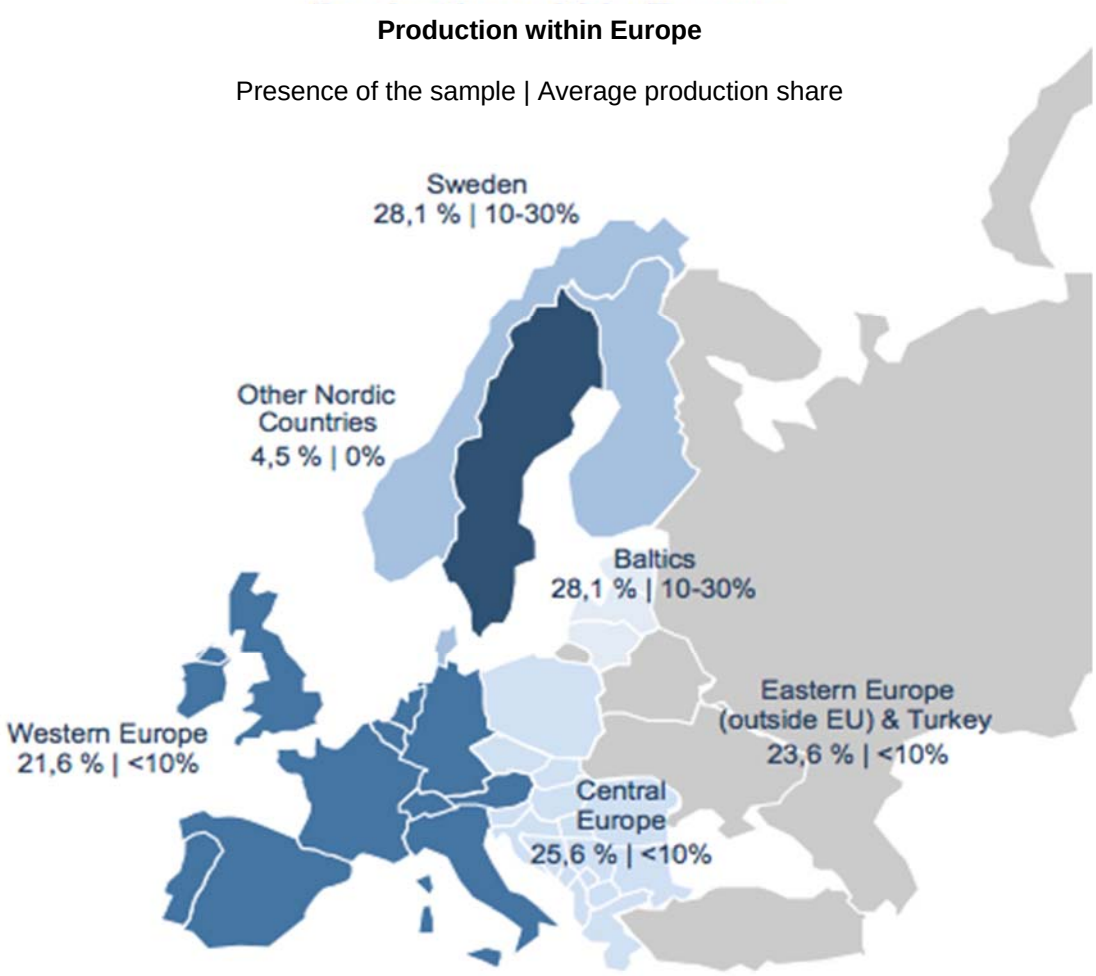

Figure 21: Production within Europe 2015

Sweden

The statistical analysis showed that Interior companies and Technical textile companies have a greater production share in Sweden than do Fashion and Apparel companies.

There was a significant difference between the companies based on turnover size and production in Sweden today. Small companies with a turnover smaller than 50 million SEK has a larger share of production in Sweden compared to the companies with a turnover larger than 50 million SEK. The median production share value for companies with a revenue less than 50 million SEK were less than 10%, while for companies with a larger turnover it was almost zero. The greatest share of production is seen among companies with a turnover smaller than 20 million SEK. The median share of production is less than 10% for companies with a turnover between 10-50 million SEK and almost zero for companies with revenue larger than 50 million SEK.

There was significant difference between the manufacturing companies and the retailers. Companies that are manufacturers have a larger production share in Sweden

than retail companies. Especially when it comes to companies with a median production share over 50%, almost all companies are manufacturers.

Regarding closeness between production and the market, the statistical analysis showed that companies that have large production share in Sweden value closeness to market more than who not produce in Sweden or only have some part of their production there.

The statistical analysis showed that innovation is the most common competitive element among companies that produce in Sweden. The median production share value for the companies that find innovation is important is 30-50%. Low price, Design and High quality got the lowest median values in the statistical test, which indicate that those are not common competitive elements among companies with production in Sweden. The internal factors listed below are those who seem to affect to what extent companies produce in Sweden.

- Type of textile product
- Size of the company
- Manufacturing or retail company
- Considered importance of geographical closeness between production and market
- The competitive element Innovation

The price tag for garments that are produced in Sweden is high and usually only finishing or printing is done in Sweden[33] one prerequisite for production in Sweden is that the customers are willing to pay the price; therefor it is mainly niche products, product samples, or "special edition" products that are fully manufactured in Sweden[34][35].

Eastern Europe (outside EU) & Turkey

It is mainly Fashion and Apparel companies that produce in the countries in Eastern Europe (outside EU) and in Turkey. Fashion and Apparel companies' production share is up to 10-30%, and the corresponding production share is smaller for Interior textile companies, up to 10%, and almost non-existent, 0%, for Technical companies

There is a significant difference between Large companies and Small to Medium sized companies regarding production share in these countries. Large companies, with a turnover larger than 100 million SEK; have to a greater extent a higher share of production in the non-EU countries in Eastern Europe and in Turkey, and companies with a revenue larger than one billion SEK has the largest production share with a median production share of 10-30%.

The statistical analysis showed a difference between manufacturing companies and retailers. It is more common among the manufacturing companies to produce in Eastern Europe and Turkey than among retail companies. Of the companies that produce in Eastern Europe and Turkey, the statistical analysis showed that a larger proportion of them find it important with geographical closeness between production and the head quarter.

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33 CEO, Company B, Interviewed on the 29th of May, 2015

34 Supply Chain Director, Company A, Interviewed on the 28th of May, 2015

35 Production Manager, Company E, Interviewed on the 5th of June, 2015

The factors that seem to be associated with production in Eastern Europe (outside EU) and Turkey are the following:

- Type of textile product
- Size of the company
- Manufacturing or retail company
- Considered importance of geographical closeness between production and the head quarter

4.2.3.2. Production in Asia today

More than 80% of the Fashion and Apparel companies, more than 50% of the Technical textile companies and 50% of the Interior textile companies have production in Asia.

Fashion and Apparel companies have the highest share of production, with a 30-50% mean share of production. Technical textile companies have the largest span of production share in Europe, but the mean production share for the group 10-30%. Regarding the size of the companies, the statistical analysis showed that large companies with a turnover higher than 100 million SEK have larger production share in Asia than Small to Medium sized companies. There is a significant difference between companies that are manufacturers or retailers and produce in Asia. Companies that are retailers and do not own their production have larger production share in Asia. Following factors that can be associated with production in Asia are:

- Type of textile product
- Size of the company
- Manufacturing or retail company

The diagram below, figure 22, illustrates the distribution of the total production in Asia today between the different Asian countries.

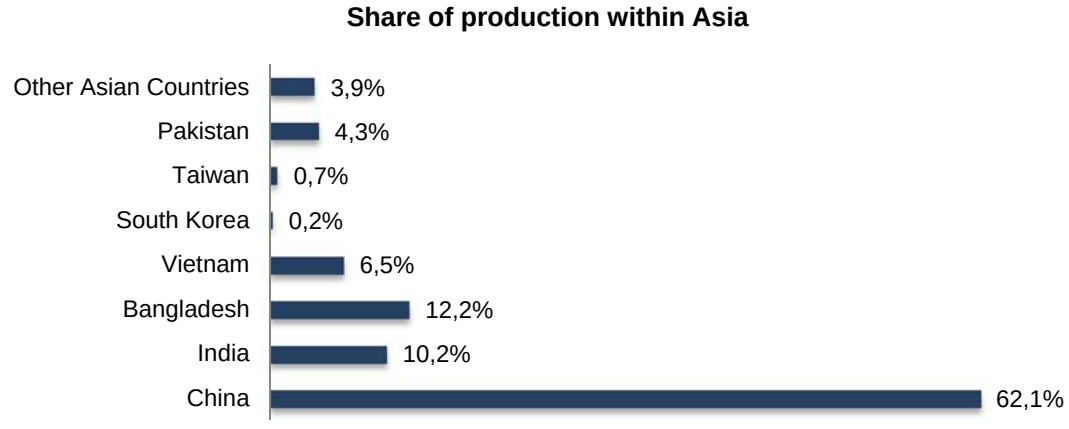

Figure 22: Share of production within Asia 2015

62,1% of the production in Asia is performed in China. The next following are Bangladesh and India, with markedly smaller shares.

China clearly stands also out when it comes to presence of production and average share of production, as shown in figure 23. More than 75% of the companies have some part of their production in China and the average share of production is 30-50%, which is the highest production share for an individual country or area. All other countries in

Asia have an average production share that is smaller than 10%. India and Bangladesh have the largest presence of Swedish textile and Apparel companies in Asia after China, both almost 40% of the sample. In *Vietnam*, *Pakistan* and *Other Asian Countries* approximately 20% of the sample has located some part some their production. In *Taiwan* and *South Korea* less than 10% of the sample are represented.

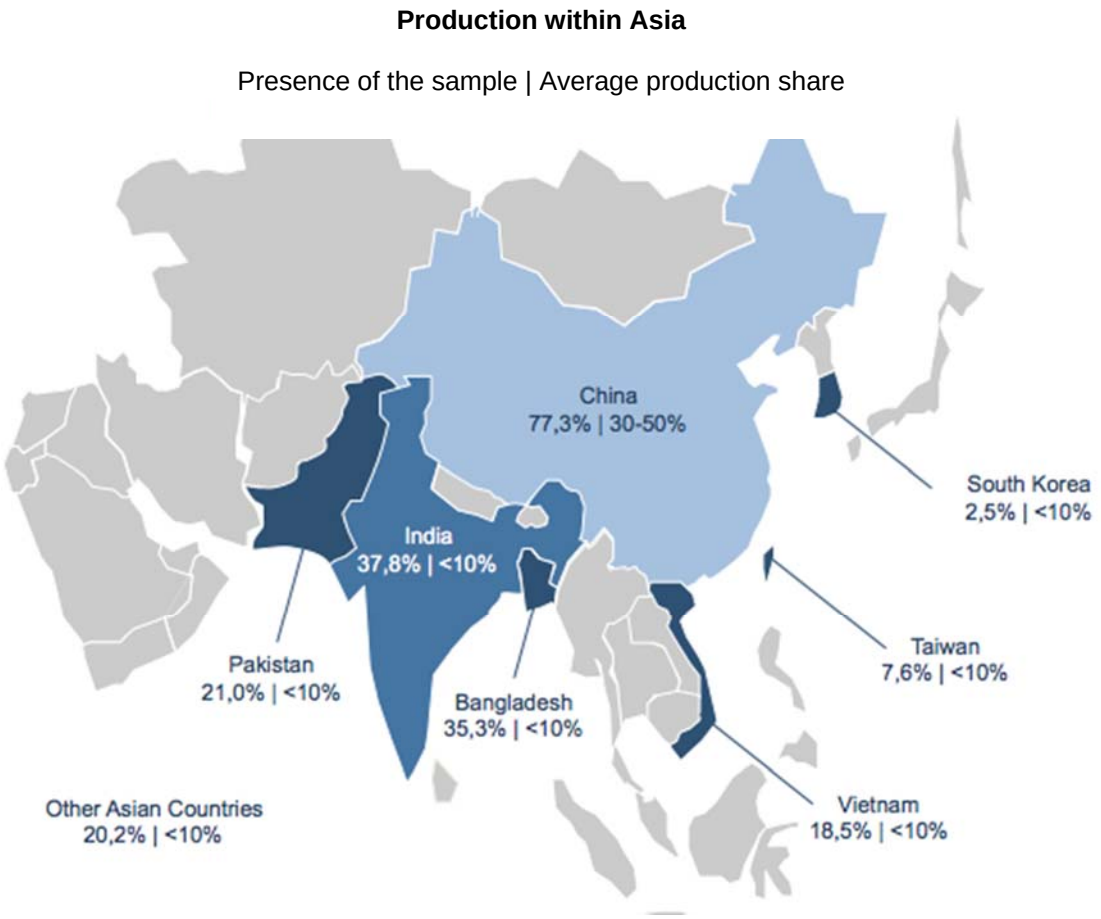

Figure 23: Production within Asia 2015

China

The presence of all company groups in China is high. Almost all Fashion and Apparel companies have production in China and approximately 50% of the Interior companies and Technical companies. The statistical analysis showed that the production share is highest for Fashion and Apparel companies, average 30-50%. The production share varies widely from low to high among the Technical textile companies with an average on 10-30%. Interior companies have a proportionally low average production share, less than 10%.

The statistical analysis showed that there is a significant difference between the companies based on turnover size and the share of production in China. Large companies are overrepresented compared to Small to Medium sized companies, and the Large companies have a larger production share. More than 40% of the Large companies have a production share over 50%, while less than 20% of the Small to medium sized companies have the same high mean production share. Companies with a turnover larger than one billion SEK stand for the largest production share with an

approximately 50% median share of production. Among smaller companies there are many that do not have any production in China at all.

There is a significant difference between manufacturing companies and retailers and production share in China. Companies that produce in China are to a larger extent retailers and the statistical analysis showed that retailers have a larger production share in China. The companies with a mean production share over 50%, more than twice as many of them are retailers instead of manufacturers.

Regarding closeness between production and the market, the statistical analysis showed that the companies that have a large proportion of their production in China to a greater extent value closeness to market, than those who have smaller share of production in China.

There is a significant difference between the companies with different competitive elements and share of production in China. Companies with Low price and Design as their competitive elements has the highest median values for share of production in China, and the median value for these groups were a share of 50% of production in China. Companies that have innovation as their main competitive element were the ones with the lowest median value.

The factors listed below seem to have an impact on the share of production in China:

- Type of textile product
- Size of the company
- Manufacturing or retail company
- Considered importance of geographical closeness between production and market
- Competitive element Low price and Design

India

There is a significant difference between companies with different customers and share of production in India. Companies that have consumers as they main customers have higher median production share in India, a less than 10%, compared to those who have companies as their main customers, their media production share is zero. Regarding the size of the companies that produce in India, the statistical analysis showed that Large sized companies are overrepresented in India. Twice as many Large companies has a mean production share around 20% compared to Small to Medium companies. The statistical analysis also showed that a greater proportion of those who produce in India are retailers.

The three factors listed below seem to affect the production share in India.

- Type of main customers
- Size of the company
- Manufacturing or retail company

Bangladesh
A significant difference was observed between the companies based on company size and production in Bangladesh. Of the companies that have production in Bangladesh it is the Large companies that stand for the largest production share. It is almost twice as many companies Large sized companies compared to Small and Medium sized companies in all production share categories, from 10% to 75% mean production share.

There is a significant difference between manufactures and retailers and production share in Bangladesh. It is almost twice as many retailers than manufacturers who produce in Bangladesh. For manufacturers the mean production values is around 20%, but for retailers it varies up to 50% production share.

The statistical analysis showed a difference between production in Bangladesh and closeness to Market, Head quarter and Design & Product development. A greater proportion of the companies that have production in Bangladesh do not think it is important with closeness to customers, than those who not produce there. Also companies that have a larger proportion of their production in Bangladesh do not find it important with closeness between production and Head quarter. Of the companies that produce in Bangladesh, a lot of them do not find it important with closeness to Design & Product development. Among the companies that do not produce in Bangladesh, more than twice as many think it is important with closeness between production and Design & Product development.

The factors below showed significant differences for production in Bangladesh:

- Size of the company
- Manufacturing or retail company
- Considered importance of geographical closeness between production and market, head quarter and design & product development.

Vietnam
The statistical analysis showed that there is a significant difference between the company size and production in Vietnam. The analysis showed that Large companies have a larger share of production than Small to Medium sized companies in Vietnam. One factor is associated with production in Vietnam:

- Size of the company

Other Asian Countries
There is a significant difference between companies that produce in Other Asian countries and considered importance of geographical closeness between production and head quarter and design & product development. Companies that have production in Other Asian countries to a larger extent do not find it important with closeness to Head quarter. The statistical analysis showed a similar result for geographical closeness to Design & Product development. A large proportion of those who produce in Other Asian countries do not value closeness to Design & Product development, while those who not produce in Other Asian countries almost twice as many of them find it important with geographical closeness between production and Design & Product development. The factors below are associated with production in Other Asian counties:

- Considered importance geographical closeness between production and head quarter and design & product development.

4.3. Change of global production until 2025

In this section the results regarding production in 2025 are presented. Firstly a description of the change of the desired capabilities is provided, followed by the change of external factors and a description of the geographical changes of production between continents and countries. The statistical analysis that laid ground for this section can be found in the appendices E, F and G.

4.3.1. Desired capabilities 2025

Figure 24 below shows the results regarding desired capabilities today and in 2025. The capabilities that are predicted to have the highest proportional increase in importance in the future are the two aspects of speed, namely Short time from product idea to production start and Short time from order to market. Flexibility and quality will also increase for the disadvantage of *High delivery reliability* and *Low cost*. However, delivery reliability will still have a high importance and is found as second behind high quality.

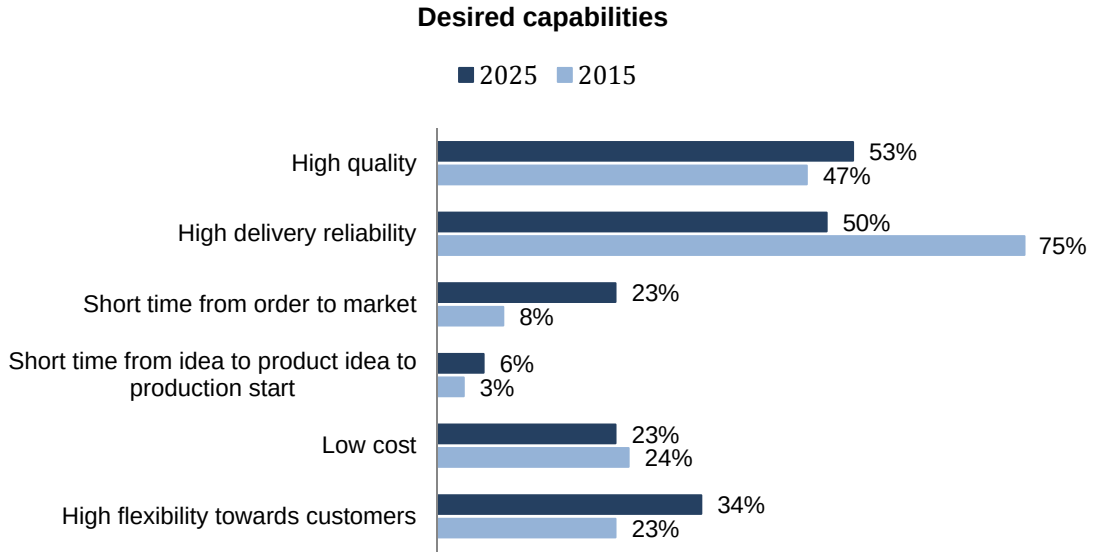

Figure 24: Change of desired capabilities until 2025

4.3.2. Increased importance of external factors until 2025

Almost no respondents believe in a decreased importance of any of the external factors, hence only the increase is shown in figure 25 below. Social factors and Environmental and political factors were believed to increase in importance by a majority of the companies, and over 60% of the companies believe that these external factor groups will become more important until 2025. That environmental and social factors, such as CSR questions and ISO standards, will be more important in the future was confirmed during interviews[36][37][38][39][40][41].

[36] Production manager, Company E, Interviewed on the 5th of June, 2015
[37] CEO, Company D, Interviewed on the 1st of June, 2015
[38] CEO, Company B, Interviewed on the 29th of May, 2015
[39] Design and Product development director, Company C, Interviewed on the 1st of June, 2015
[40] Elin Lyhdal, General Secretary, Sveriges Textil och Modeföretag, Interviewed on the 11th of March, 2015.
[41] Development and sourcing manager, Company F, Interviewed on the 10th of June, 2015

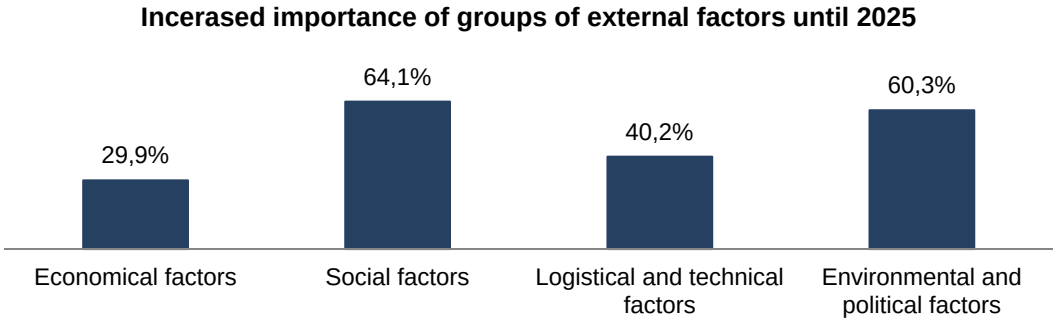

Figure 25: Increased importance of groups of external factors

Significant differences were found for the future importance of environmental and political factors between the different sizes of companies and the different company types. Among companies with a turnover between 100 million SEK to 1 billion SEK, 70% believe that the political and environmental factors will have increased importance. The same number for companies between 50-100 million SEK is 59,3% and for companies between 20-50 million SEK the share is 56,5%. There is also a significant difference between the types of companies, and 67,5% of the fashion and apparel companies believe that the importance of environmental and political factors will increase, the corresponding number for interior textiles is 37,5% and for technical textiles the number is 52,2%.

Regarding the change of social factors there is a connection between in what continents the companies are present today. Among companies that do not have any production in Europe today 89% believe that social factors will be more important in 2025. This is significantly different from the companies that have some part of their production today, where the corresponding share is 60%.

No other significant differences were observed between the other company and product characteristics.

4.3.3. Change of global production in world continents

The map below, figure 26, gives an overview of the changes in the world continents. All the continents have a net increase of production seen to the amount of companies that will change their production. Europe will have the largest increase, 57,1% of the companies said that they will increase in Europe. 21,8% of the companies predict that they will increase in Africa. The largest decrease of production is observed in Asia and as many as 23,5% of the companies will decrease their production here.

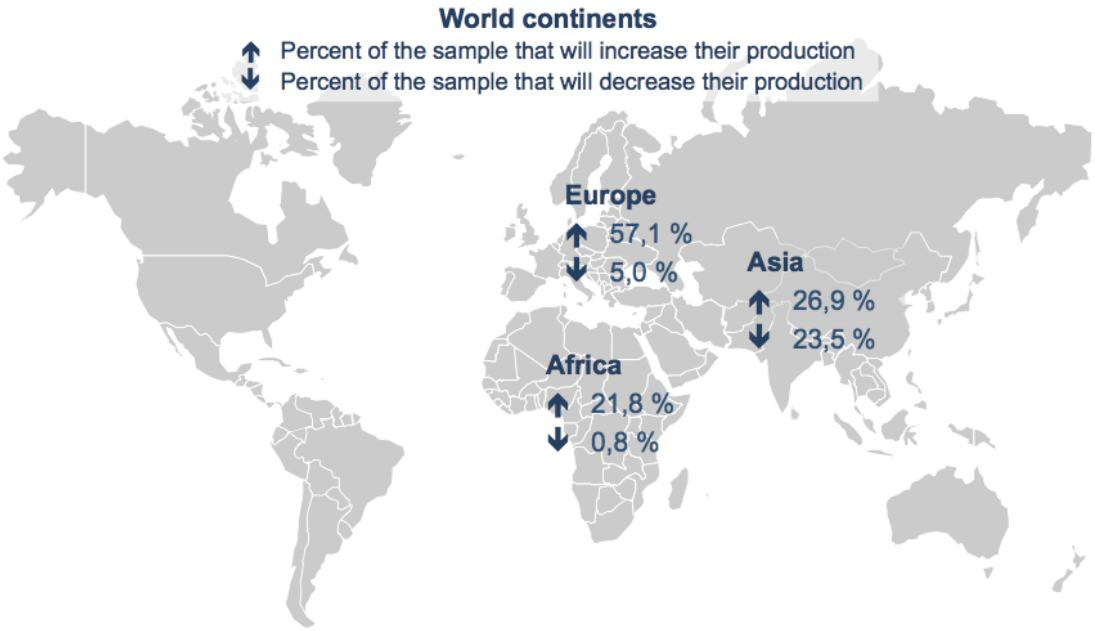

Figure 26: Change of production in the world continents until 2025

The companies that will decrease in Asia will move their production to Europe and Africa according to the map in figure 27. The majority, 82%, of the companies that will decrease in Asia will increase in Europe, and 18% will increase in Africa.

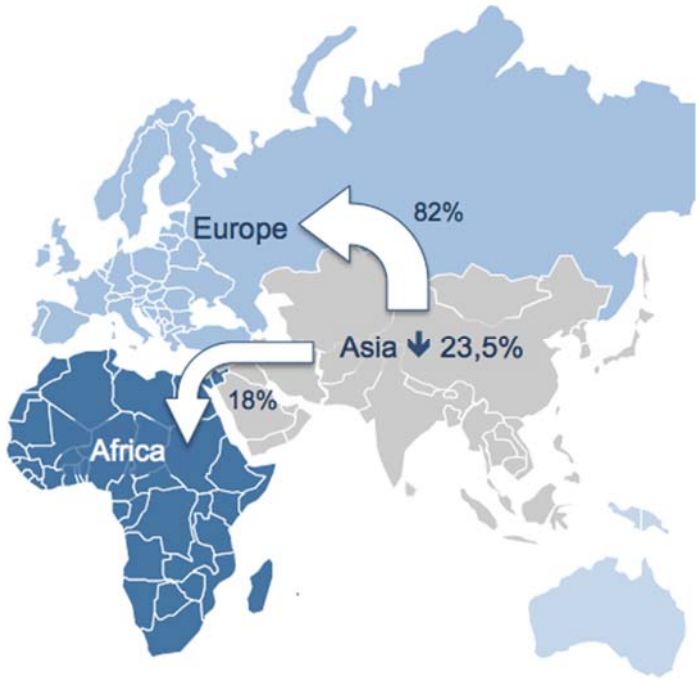

Figure 27: Move of production from Asia

4.3.3.1. Change of production in Europe

Figure 28 below shows the change of production for different areas within Europe. The countries were most companies plan to increase are the countries outside EU including Turkey, the Baltics and Central Europe. These regions are associated with lower costs

than the other parts of Europe but compared to Asian countries they are closer to the European market[424344].

One reason for the increase of production Europe seems to be the increased importance of being fast to the market that was identified, especially among fashion and apparel companies[454647]. Some relationships that were found in the statistical analysis showed that the largest share of those that believe in an increase of production in Europe are found among those who regard closeness to market and warehouse as *Important* or *Very important*, which could mean that the main driver behind increasing production in Europa is the fact that it is geographically closer to the market and to warehouses, which in turn means shorter time to customer. The relationship between considered importance of geographical closeness and other business functions was also identified at country level, described further below. Another relationship that was identified was that 82,4% of companies that rate Social factors as the most important group plan an increase in Europe, compared to those who rated it as the least important factor.

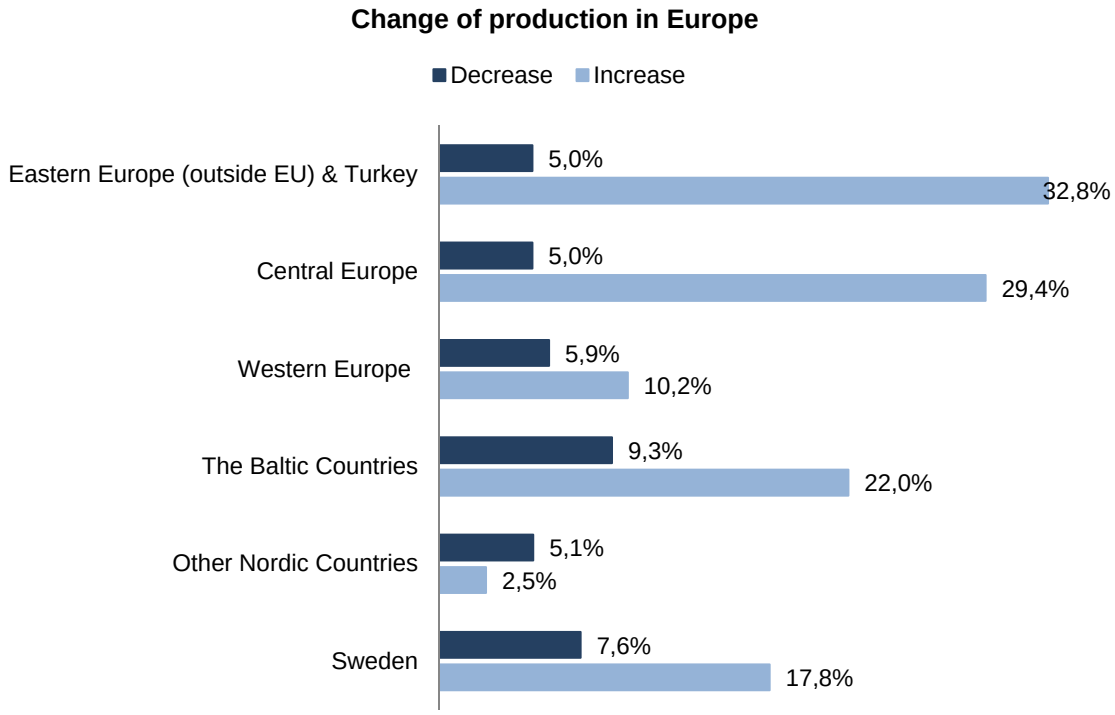

Figure 28: Change of production in Europe until 2025

Sweden

The largest share of companies that plan to increase production in Sweden is found among those who consider closeness to market Very Important and 35,3% in this group plan to increase in Sweden. For companies that rate market closeness as *Not important*, *Less important* and *Important* the same shares are 13%, 17,6% and 22,2% respectively. There is also a connection between importance of closeness between production and warehouse, and among those that rate it as Important or *Very Important*, 27,6% plan to

[42] Design and Product development director, Company C, Interviewed on the 1st of June; 2015
[43] CEO, Company D, Interviewed on the 1st of June, 2015
[44] Production Manager, Company E, Interviewed on the 5th of June, 2015
[45] Design and Product development director, Company C, Interviewed on the 1st of June, 2015
[46] Production Manager, Company E, Interviewed on the 5th of June, 2015
[47] CEO, Company D, Interviewed on the 1st of June, 2015

increase, and among those who rate it as *Not important at all* or *Less important* the corresponding number is 11,9%. How many times the companies have moved within the last five years also seem to be connected to the decision to increase production in Sweden. Out of the frequent movers, who have moved more than three times within the last five years, only 5,3% will increase in Sweden compared to those who have moved less frequent where the corresponding share is 30,6%. The share among manufacturing companies that plan to increase in Sweden is larger than among the retail companies, with 34,8% compared to 9%. To conclude, factors that seem to be associated with a plan to increase production in Sweden are:

- Considered importance of closeness between production and market and between production and warehouse
- Number of moves within the last five years
- Manufacturing or retail company

The high production cost might be considered an obstacle for some companies for increased production in Sweden, and a crucial factor is whether the customers are willing to pay the higher price tag[48][49].

The Baltic countries

The statistical tests showed one relationship between the plan to increase production in the Baltics, namely the considered importance of Social factors. Among those who rated the Social factors as the most important group of external factors, 64,3% plans to increase in the Baltics. There seems to be one factors that corresponds to the decision to increase production in the Baltic countries:

- Considered importance of Social factors

The Baltic countries also have the advantage of being close to Sweden and the European market which can be valuable in the future because of the desired capability of having a short time to market[50][51].

Eastern Europe (outside EU) and Turkey

The type of company that stands for the largest increase of production in Eastern Europe and Turkey are Fashion & Apparel companies, where as many as 48,5% will increase production. One other relationship was found between increase in this area and it was the connection to quality as a desired capability. Out of the companies who consider high quality as one of the most important desired capabilities today, 52,3% plan to increase in Eastern Europe, compared to the rest where only 29,1% plan to increase. There are thus two different factors that seem to be associated with the increase of production in Eastern Europe:

- Type of textile product
- High quality as a desired capability

[48] Supply Chain Director, Company A, Interviewed on the 28th of May, 2015

[49] CEO, Company X, Interviewed on the 3rd of March, 2015

[50] Rudrjajeet Pal, Lecturer in Textile management, Swedish School of Textiles, University of Borås, Interviewed on the 4th of March, 2015

[51] Elin Lyhdal, General Secretary, Sveriges Textil och Modeföretag, Interviewed on the 11th of March, 2015.

Eastern Europe and Turkey are close to the market, which can be considered advantageous for Fashion and apparel companies[52].

Central Europe

A significant difference was found between frequent movers and less frequent movers and the plan to increase in Central Europe. Among the frequent movers, who have moved more than three times within the last five years, 52,8% plan to increase in Central Europe, compared to 26,3% in the other group.

- Number of previous moves

One advantage of many countries in Central Europe, like Bulgaria and Romania, is that they are a part of EU, which make collaboration easier since the trade barriers are lower, but the price structure is favourable compared to other parts of Europe[53]. Another advantage is that the countries are closer to Sweden and to the European market[54].

4.3.3.2. Change of production in Asia

The statistical analysis for the Asian continent showed that there is a significant difference between retail companies and manufacturing companies regarding production change in Asia, where 38,3% of the manufacturing companies will decrease production compared to 22,6% of the retail companies. A smaller share of companies that value geographical closeness between production and Head office believe in an increase of production in Asia than among those who rate it as less important. 46,2% of those who rate it as *Not important at all* believe in an increase and this number decreases as the rated importance increases, ending at 18,2% of the companies among those who rate it as *Very important*.

Figure 29 below shows the increase and decrease in the Asian countries. The countries that will have a net decrease of production are Taiwan, South Korea and China. As much as 38,1% of the companies plan a decrease of production in China and only 12,7% plan to increase. A large share of the companies plans to increase in Bangladesh, Vietnam and the Other Asian countries.

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[52] Rudrjajeet Pal, Lecturer in Textile management, Swedish School of Textiles, University of Borås, Interviewed on the 4th of March, 2015

[53] Production Manager, Company E, Interviewed on 5th of June, 2015

[54] Design and Product development director, Company C, Interviewed on the 1st of June, 2015

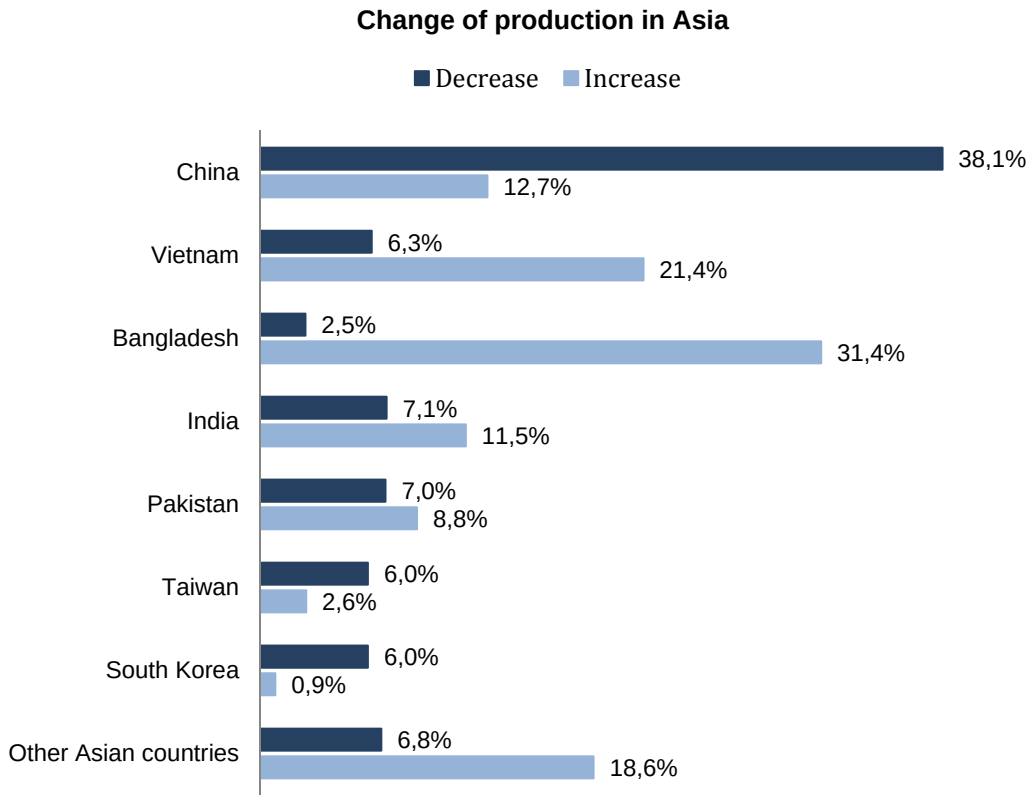

Figure 29: Change of production in Asia until 2025

The statistical tests for changes on country level showed differences between different company characteristics and increase or increase of production in China, Bangladesh, Other Asian countries and Vietnam. These results are presented below.

China

47,3% of the fashion and apparel companies plans to decrease in China until 2025. The statistical tests show that there is a significant difference between companies that regard closeness to head office and warehouse as very important and those who think it is less important. 51,5% of the group of companies that rank geographical closeness between head office and production as *Important* or *Very important* plan a decrease in China compared to 24,4% of those who rate it as *Less important* or *Not important at all*. Factors that seem to have an effect on the decision to *decrease* production in China are:

- Type of textile product
- Considered importance of closeness between production and head office and between production and warehouse.

The main reason for the decrease of production in China seem to be the increase of production cost, mainly in terms of higher salaries[55][56][57][58][59], which was also implied

[55] CEO, Company B, Interviewed on the 29th of May, 2015

[56] Design and Product development director, Company C, Interviewed on the 1st of June, 2015

[57] Jonas Larsson, Lecturer, Swedish school of textiles, University of Borås

[58] Elin Lyhdal, General Secretary, Sveriges Textil och Modeföretag, Interviewed on the 11th of March, 2015.

[59] Development and sourcing manager, Company F, Interviewed on the 10th of June, 2015

during preliminary interviews[60]. Another reason could be the fact that the social structures of China are changing, and that it is becoming more difficult to attract people to work in textile production[61].

Bangladesh

A large share, 31,4%, of all companies plans to increase production in Bangladesh, and many of these companies are found among those who produce in China today. Several relationships between a planned increase in Bangladesh and company characteristics were identified in the statistical analysis. Among large companies, with a turnover larger than 100 million SEK, 52,8% believes in an increase of production in Bangladesh. The corresponding number for small and medium sized companies is only 24,3%. Larger companies seem therefor more likely to increase production in Bangladesh. Among the companies who regard closeness between production and design as *Important* or *Very Important* 23,7% plan to increase production in Bangladesh, compared to those who value it as *Less Important* or *Not important at all*. Among frequent movers, companies that have moved production more than 3 times within the last years, 57,1% plan to increase in Bangladesh, compared to 30,9% of those who have moved 3 times or less. 63,6% of the retail companies plan to increase compared to 26,2% of the manufacturing companies. 63,6 % of the companies who said that Low cost will be one of the most important desired capabilities in 2025 will increase in Bangladesh, compared to 33,8% among those who did not choose this. Lastly, a connection was also found between the considered importance of Working conditions, and only 18,2% of the companies who consider it *Very important* plan to increase, compared to 65,5% among those who consider it as *Less important*. To conclude, the statistical analysis showed that factors that seem to have an impact on the decision to *increase* production in Bangladesh are:

- Company size
- Number of previous moves
- Considered importance closeness between design and production
- Manufacturing or retail company
- Low cost as a desired capability in 2025
- Considered importance of Working conditions

Other Asian countries

35,5 % of the large companies plans to increase production in Vietnam, compared to 11,8% among the small companies. The share of companies that plan to increase is larger among all companies that consider closeness to customers, design and head office as *Important* or *Very important* compared to those who consider it *Less Important* or *Not important at all.* Among the frequent movers, who have moved more than three times the last five years, 45,5% plan to increase in the Other Asian countries, compared to 13,5% among those who have moved less. The decision to increase in Other Asian countries seems to depend on the following factors:

- Company size
- Considered importance of closeness between production and customers, design and head office
- Number of previous moves

[60] Rudrjajeet Pal, Lecturer in Textile management, Swedish School of Textiles, University of Borås, Interviewed on the 4th of March, 2015

[61] Supply Chain Director, Company A, Interviewed on the 28th of May, 2015.

Vietnam

Among the frequent movers, 45,7% plans to increase in Vietnam, compared to 16,3% of those who have moved a smaller number of times. 42,0% of the retail companies plans to increase production in Vietnam, compared to 16,3% of the manufacturing companies. In other words, there are two factors that seem to affect the decision to increase production in Vietnam:

- Number of previous moves
- Manufacturing or retail company

Production in Vietnam might increase in the future due to new trade agreements between EU and Vietnam[62]. Vietnam is predicted to have a favourable pricing structure but they also have competence within technical textiles, shoe and accessory production[6364].

4.3.3.3. Change of production in Africa

A large share of companies plan an increase in Africa, but it became clear during the interviews that there are still some barriers that need to be overcome before movements can be realised[6566676869]. During the interviews, several participants mentioned that they are waiting for larger actors to "make way", which will create better conditions regarding infrastructure and competence. However, Africa has a large supply of raw material and it is close to the European market[7071].

[62] Supply Chain Director, Company A, Interviewed on the 28th of May, 2015

[63] CEO, Company D, Interviewed on the 1st of June, 2015

[64] Development and sourcing manager, Company F, Interviewed on the 10th of June, 2015

[65] Design and Product development director, Company C, Interviewed on the 1st of June, 2015

[66] Production Manager, Company E, Interviewed on the 5th of June, 2015

[67] Supply Chain Director, Company A, Interviewed on the 28th of May, 2015

[68] CEO, Company B, Interviewed on the 29th of May, 2015

[69] Development and sourcing manager, Company F, Interviewed on the 10th of June, 2015

[70] Production Manager, Company E, Interviewed on the 5th of June, 2015

[71] Elin Lyhdal, General Secretary, Sveriges Textil och Modeföretag, Interviewed on the 11th of March, 2015

5. Discussion

The research questions in the study were answered mainly by the use of an extensive survey, but the results were also discussed with actors in the industry. Each of the research questions are discussed below based on the results presented in the previous chapter.

> *RQ1: Where are Swedish textile and apparel companies locating their production today?*

This question was answered by letting the respondents in the survey answer the question regarding where their companies produce today. The respondents got to estimate the share of production in the world continents and in different regions on an ordinal scale. The results have, due to the nature of the questions, a degree of uncertainty that needs to be considered. However, the results provide a general view that gives an insight into how different production locations stand in relations to each other in terms of production share.

The results from the survey show that Swedish textile and apparel companies produce on a global basis, and the production for the industry as a whole is evenly distributed between Asia and Europe. A majority of the companies have production on both of these continents. Almost no production is performed in Oceania, America and Africa.

The largest share of the industry's production is located in China. The subsequent production locations are Sweden and the Baltic countries, followed by different European regions. Among the Asian countries Bangladesh and India are the countries with the second and third largest share of production after China. The results differ to some extent from the global textile and apparel industry and the information that could be found in literature, where the Asian countries hold a larger share of production.

> *RQ2: How will the Swedish textile and apparel companies change the location of their production until 2025 and why?*

By asking the survey respondents how they plan to change their production in different locations within the next ten years, until 2025, indications regarding the change of production in different areas were generated. The results from the survey showed some interesting tendencies within the industry, especially regarding the change of production on continent level.

Looking at the changes on continent level, as many as every fifth company plan to increase production in Africa and half of the companies plan to increase in Europe. The results also showed a stagnation of production in Asia, where the number of companies that plan to increase is almost the same as the number that plan to increase. The companies that plan to decrease production in Asia were investigated further in order find out where they plan to move their production instead and the results indicated that the largest stream will go from Asia to Europe, but also to some extent to Africa. There are in other words, three clear tendencies regarding change of production location on a continent level: Increase of production in Europe, increase of production in Africa and stagnation of production in Asia.

On a country, or regional level, some additional tendencies were identified. The most important is the drastic decrease of production in China, where as many as 38,1% of all companies plan to decrease production, which means that more than half of the companies that produce in China today will decrease their production there. Since China is the country that has the highest presence of Swedish companies, but also stands for the largest share of the total production, this result is remarkable. However, it was to some part expected based on what was found during the literature review (Jacob, 2013; Chao & Lu, 2015) but also in discussions during preliminary interviews[72][73]. In the other Asian countries, the largest increase was identified in Bangladesh, but increases were also seen in Vietnam and in the countries referred to as Other Asian countries, including Cambodia, Indonesia etc. Bangladesh is already a large producer of apparel from a global perspective but according to this study, still not a major production location for Swedish companies.
The cases included in this study were chosen based on their planned changes of production locations, and the purpose was to investigate the tendencies presented above.

Based on the survey data, all planned changes of production were tested statistically against company and product characteristics. No significant differences were found between the companies that plan to increase production in Africa and the companies that do not. However, the case interviews contributed with valuable insights from companies that plan to increase production in Africa. The north countries of Africa, such as Ethiopia and Egypt, were described as countries with the benefit of lying close to the market[74]. These countries could be possible future destinations for low-cost production when prices are rising in current popular countries such as China, findings that are consistent with Chao & Lu (2015). However, several cases highlighted that they are waiting for large actors, such as H&M, to make way since the production infrastructure still is more or less non-existing[75][76][77].

During preliminary interviews opinions were differing regarding the existence of a possible trend where production is moved from Asia to Europe and Sweden. The result from this study cannot confirm that there is an actual trend, but it indicated that there is at least a desire among many companies to move production from offshore locations in Asia back to Europe and Sweden. Two of the cases plan to decrease their production in Asia for the advantage of Eastern and Central Europe, which in both cases were motivated by a desire to decrease lead times[78][79].

The survey showed that mainly large companies produce in Asia, and one of the cases that does not plan to decrease production in Asia claimed that the larger their company

[72] Jonas Larsson, Lecturer, Swedish school of textiles, University of Borås, Interviewed on the 3rd of March, 2015
[73] Elin Lyhdal, General Secretary, Sveriges Textil och Modeföretag, Interviewed on the 11th of March, 2015
[74] Production Manager, Company E, Interviewed on the 5th of June, 2015
[75] Supply Chain Director, Company A, Interviewed on the 28th of May, 2015
[76] Design and Product development director, Company C, Interviewed on the 1st of June, 2015
[77] Development and sourcing manager, Company F, Interviewed on the 10th of June, 2015
[78] CEO, Company B, Interviewed on the 29th of May, 2015
[79] Design and Product development director, Company C, Interviewed on the 1st of June, 2015

gets - the larger share of the production is performed in Asia[80]. The case planned a decrease of production from China for the advantage of other countries in Asia, mainly because the rising production costs in China. The other Asian countries are still cheap and there is a lot of knowledge regarding production of textile and apparel production[8182]. The statistical analysis indicated that there might also be a desire of having production close to head office and warehouse that lies behind the decrease in China.

The results from the survey showed that the share of companies that plan to increase production in Europe is larger among those who value having production close to the market and warehouse, factors that help decrease time-to-customer. During discussions with companies that plan to decrease production in Asia but increase production in Europe, it was clear that the main driver behind this was the wish to decrease lead times, which has gained increased importance as a means to stay competitive[838485], but factors such as less transport from an environmental perspective were also mentioned[86]. One case planned an increase of production in Sweden, which was also motivated by the wish to decrease lead times.

To conclude, four general tendencies, three on continent level and one on country level, can be seen among Swedish textile and apparel companies when it comes to changes in location of production:

- A stagnation of production in Asia. The net change of production in Asia seen to the amount of companies that plan to increase compared to the amount that plan to decrease, is almost zero. The explanation behind these changes seems to be a desired to decrease the long lead-times that are associated with production in Asia.
- A decrease of production in China, mainly to the advantage of Bangladesh and Vietnam. The explanation seems to be higher production cost but also a desire to having production close to head office and warehouse.
- An increase of production in Europe, especially in the Eastern countries outside EU including Turkey, but also in Central and Western Europe, The Baltic countries and in Sweden. A majority of the companies that plan to decrease production in Asia plan to increase in Africa, which seem to depend on a desire of having production closer to the customer in order to decrease lead-times.
- An increase of production in Africa. As many as every fifth company plan an increase of production in Africa and the explanation seems to be a desire to decrease lead times, even though this connection could not be shown statistically. However, this tendency seems to be depending on large actors to make way and establish the infrastructure that is needed to establish production in the African countries.

RQ3: What factors do textile and apparel companies take into consideration

[80] Supply Chain Director, Company A, Interviewed on the 28th of May, 2015

[81] Supply Chain Director, Company A, Interviewed on the 28th of May, 2015

[82] CEO, Company D, Interviewed on the 1st of June, 2015

[83] CEO, Company B, Interviewed on the 29th of May, 2015

[84] Design and Product development director, Company C, Interviewed on the 1st of June, 2015

[85] CEO, Company D, Interviewed on the 1st of June, 2015

[86] Design and Product development director, Company C, Interviewed on the 1st of June, 2015

when locating production?

The survey respondents got to rate the importance of several location-specific external factors and they then got to rank the different groups of external factors.

The results showed that companies consider several external factors when selecting location for production. Economic factors are considered the most important group of factors, even though companies do not rate the individual cost factors as more important than other factors. This might mean that the cost factors are not considered important seen individually, but that he total cost perspective is most important, a result that corresponds to previous literature on location decisions (Lowson, 2003; Christopher et al., 2004; Åkesson et al. 2007; Jin & Farr, 2010). The group of external factors that has the second highest rank is the group of social factors, followed by logistical and technical factors and lastly environmental and political factors.

Looking at individual external factors the most important factor was good working conditions. Working conditions in production is an important factor to consider, especially for a global industry such as the textile and apparel industry that has production in several development countries were working conditions usually are poorer than in developed countries. Other external factors that received high scores are good access to competence in the area and access to producers with the right technical competence, low risk for political instability and environmental awareness in the area. During the case companies within the Swedish Textile and Apparel industry the results regarding external factors were confirmed. Access to the right competence and the building of long-term relationships are factors that all of the cases consider as very important factors when selecting production location, even though the cost factors are crucial decisive factors in every decision.

The considered importance of the factors will change until 2025, and the second largest increase is seen for the external factor group that received the lowest score today, environmental and political factors and a majority of the companies believe that it will increase. The group that is believed to have the largest increase of importance is the group of social factors, which already is considered important. A conclusion that can be drawn from these results is that factors that are usually included in companies' CSR commitments are believed to increase in importance during the next ten years.

RQ4: How are decisions regarding production location affected by external and internal factors?

All survey respondents were asked questions regarding their company and product characteristics, the internal factors, and their desired capabilities in production and delivery of products and lastly the external factors. All of these factors affect company decisions regarding location and in order to investigate how, their relationships with location decisions was tested statistically but also discussed during interviews.

Starting with the company characteristics, company size, type of company, number of previous moves and whether the companies are retailers or manufacturers all seem to affect location decisions.

The number of previous moves seems to affect the ability, or the desire, to move production in the future. Turnover size seems to affect how far off the production is located, small and medium sized companies keep to a larger degree production within Europe, while large companies to a greater extent produce offshore in Asian countries. Retail companies also produce in Asia to a larger extent than manufacturing companies, which could depend on the fact that it is harder to manage self-owned factories offshore.

What type of textile product a company offers affects where the company produce. Fashion companies produce to a higher extent their products in Asia than interior and technical textile companies do. No explanation to this could be found statistically, but during one case interview it was discussed that since technical textiles require more competence, there are fewer locations where the right competence is available, compared to fashion products. One explanation could be that fashion and apparel companies, to a higher extent can utilise mass production in the low-cost Asian countries[87].

Two of the external factors that were considered most important were concerning competence, and based on interviews with companies it is clear that competence can be a decisive factor in decisions on where to produce and many companies tend to go where the competence is.

Being fast to the customers is a frequently discussed and desired capability and it was frequently mentioned during interviews as an important capability and that it highly influence decisions regarding production location. The capability was by many considered a desired capability that will have increased importance in 2025, even though it could not be found to have any statistical relationship with any plans regarding increase or decrease in specific locations, the fact that it is considered to be important in 2025 is consistent with the tendency within the industry to move production closer to Europe. In what way the other desired capabilities affect decisions on where to produce was not as evident, however high quality and high delivery reliability were to factors that are by many companies considered important on important desired capability.

Considered importance of geographical closeness between production and other functions and the market highly affects decisions regarding production location. This result might not be surprising, but it shows that location of production affects operations and that this fact needs to be considered.

The results from the survey could not give any clear indications on how the external factors affect the decisions regarding where to produce. Some very specific relationships were identified through statistical testing but no general conclusions could be drawn. This might be because of that the external factors not only vary between countries or areas, but also between different producers.

6. Conclusions

This study aimed at investigating where Swedish textile and apparel companies produce today and how the production locations will change until 2025, and what

[87] Development and sourcing manager, Company F, Interviewed on the 10th of June, 2015

factors that lie behind these decisions. This section presents the main conclusions, the main contributions and limitations of the study and recommendations for future research.

6.1. Conclusions

The study showed that Swedish textile and apparel companies produce on a global basis, and the production for the industry as a whole is evenly distributed between Asia and Europe. Almost no production is performed in Oceania, America and Africa. On a country level, the study also showed that the largest share of the industry's production is located in China. The subsequent production locations are Sweden and the Baltic countries, followed by different European regions. Among the Asian countries Bangladesh and India are the ones with the second and third largest share of production after China.

The results from the study indicate a future stagnation of production in Asia, while many companies plan to increase in Europe and Africa. The countries in Eastern Europe outside the European Union together with Turkey are where the largest share of the companies will increase their production, but an increase is seen in all parts of Europe, for example in the Baltic countries and in Central Europe. Production in Sweden will also increase. On country level the largest decrease of production is observed in China, where almost half of the companies will decrease their production. The Asian country where most companies plan to increase production is Bangladesh, and largest increase is seen among large companies, retail companies, companies that produce in China today and companies that will prioritise low cost in 2025. Other Asian countries where companies will increase production are Vietnam and India.

The study also showed that larger companies are more likely to move their production and that there is a positive relationship between previous moves and change of production within the next ten years.

Several factors are considered important when locating production, but the group of external factors that are considered most important are the economic factors. However, when individual factors are considered, good working conditions, access to technical competence and political stability are the factors that are considered most important. Other factors that are considered are availability of competent personnel, environmental awareness and existing relationships, together with well-developed infrastructure and low trade barriers. Location decisions are also affected by internal factors, such as product characteristics and company characteristics.

6.2. Main contributions

This study mapped where companies within the Swedish textile and apparel industry produce by using results generated from a carefully designed survey that was responded by 119 different companies. The study also included interviews with large actors within the industry in order to increase the reliability of the survey results. The main contributions from this research projects are

- A mapping of Swedish textile and apparel companies' current production locations
- A forecast on future changes in production location
- A description of the most important factors that affects decisions on where to locate production, and how the importance of these factors will change in the future

- How desired capabilities, external and internal factors affect decisions on where to locate production.

No similar study has recently been done for companies within the Swedish textile and apparel industry. The results from the study give a unique insight into the location decisions within the textile and apparel industry. The textile and apparel industry is one of the world's most global industries and therefor these insights can be useful for actors within other, less globalised industries that want to move production offshore, but also for actors that already are working on a global basis - that want to gain insights in changes of manufacturing changes within the next ten years. A major part of the participating companies were large actors in the industry, which might make it more interesting and useful for other industries.

6.3. Limitations and future research

Even though the choice of research approach and methods for this study enabled collection of an extensive amount of data, some limitations come as a natural cause of the survey approach.

Future research could aim at further investigating the applicability of these results on other industries, but the fact that the results connect different production locations with different desired capabilities, external and internal factors - means that it provides concrete knowledge from the Swedish textile and apparel industry. It is a global industry with experience from global production and sourcing and other industries can use this knowledge that is concretized in this study as guidance in strategic decisions regarding location of production.

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Appendix A: Statistical tests

The following parameters were used for grouping of the companies.

Parameter	Data type	Values
TEKO group	Nominal	Fashion and apparel
		Interior textiles
		Technical textiles
‘Company size (A)	Ordinal	<20 million SEK
		20-50 million SEK
		50-100 million SEK
		100 million - 1 billion SEK
		> 1 billion SEK
Company size (B)	Ordinal	Small and medium companies (Less than 100 million SEK)
		Large companies (More than 100 million SEK)
Customers	Nominal	Consumers
		Companies
		Government agencies
Own production or not	Nominal	Yes
		No
Importance of closeness between production and different operations	Nominal	Market
		Design and product development
		Warehouse
		Head quarter
		Research and development

The differences between the groups were analysed and four types of statistical test were performed depending on data types, ANOVA, t-test, chi-2 and non-parametric. The test types are specified in the table below.

Question no:	Parameter	Data type	Test
11	Importance of closeness between production and different operations	Scale	t-est and ANOVA
12	Production in different world continents	Ordinal	Non-parametric
13	Number of moves (A)	Ordinal	Non-parametric
13	Number of moves (B)	Ordinal	Non-parametric
14	Change of production in different world continents	Ordinal	Chi-2
15	Desired capabilities	Nominal	Chi-2

16	Production in different Asian countries	Ordinal	Non-parametric
17	Change of production in Asian countries	Ordinal	Chi-2
18	Production in different European countries	Ordinal	Non-parametric
19	Change of production in European countries	Ordinal	Chi-2
20-24	External factors	Scale	t-test and ANOVA
25	External factor groups	Scale	t-test and ANOVA

Appendix B: Survey Questions

Page 1: "About your company and its products"

1. What is your role in your company?
   a. CEO
   b. Vice President
   c. Purchasing manager
   d. Production manager
   e. Other, please specify:
2. How large is your company's annual turnover?
   a. Less than 20 million SEK
   b. 20-50 million SEK
   c. 50-100 million SEK
   d. 100 million - 1 billion SEK
   e. More than 1 billion SEK
3. Who are your company's main customers?
   a. Consumers
   b. Companies
   c. Government agencies
4. Which of the following activities are included in your company's operations?
   a. Raw material production
   b. Production of yarn and/or synthetic fibre
   c. Textile production and or textile finishing
   d. Production of non-textile accessories (i.e. buttons or zippers)
   e. Sewing
   f. Design and/or Product development
   g. Retail
5. How big share of your turnover does the largest product group generate?
   a. Less than 30%
   b. 30-50%
   c. 50-70%
   d. 70-100%
6. Which of the following groups does the largest product group belong to?
   a. Fashion & Apparel
   b. Interior textiles
   c. Technical textiles
   d. Other, please specify
7. How long is the life cycle for a typical product within the largest product group?
   a. Less than 1 month
   b. 1 to 6 months

c. 6 to 12 months
d. More than 12 months

8. Which of the following capabilities are most important for your company to achieve in production and delivery of products within the largest product group? (Choose maximum 2 alternatives)
   a. High flexibility towards customers
   b. Low cost
   c. Short time from product idea to production start
   d. Short time from order to market
   e. High delivery reliability (right quantity, right quality and right time)
   f. High quality
9. What alternative describes best how your company creates value for its customers?
   a. High service
   b. Low price
   c. Strong brand
   d. Innovation
   e. Design
   f. High quality
10. Does your company own any production?
   a. Yes
   b. No

Page 2: "Localisation of production (part 1)"

11. How important is it for your company with geographical closeness between production and the following?
   Ranging from *Not at all important, Less important, Important* and *Very important* or *Not applicable*
   a. Market
   b. Design and product development
   c. Warehouse
   d. Head quarter
   e. Research and development
12. Where does your company produce today? Specify the percentage distribution between the world continents.
   No production, <15%, 15-50%, >50%, All production
   a. Europe
   b. Asia
   c. South and North America
   d. Africa
   e. Oceania
13. How many times has your company moved its production (within or over country borders) within the last five years?
   a. 1-2 times

b. 3-5 times
c. More than 5 times
d. We have not moved our productions within the last five years

14. How will your company's production change in the world until 2025?
Decrease, *unchanged* or *increase*
a. Europe
b. Asia
c. South and North America
d. Africa
e. Oceania

15. Which of the following capabilities are expected to be most important for your company to achieve in production and delivery of products within the largest product group in *2025*? (Choose maximum 2 alternatives)
a. High flexibility towards customers
b. Low cost
c. Little time
d. Short time from product idea to production start
e. Short time from order to market
f. High delivery reliability (right quantity, right quality and right time)

Page 3: "Localisation of production (part 2)"

16. How much of your production is performed in the following Asian countries today?
No production, <10%, 10-30%, 30-50%, >50%, All production
a. China
b. India
c. Bangladesh
d. Vietnam
e. South Korea
f. Taiwan
g. Pakistan
h. Other Asian Countries

17. How is the amount of production in the following Asian countries expected to change until 2025?
Decrease, *unchanged* or *increase*
a. China
b. India
c. Bangladesh
d. Vietnam
e. South Korea
f. Taiwan
g. Pakistan
h. Other Asian Countries

18. How much of your production is performed in the following European countries today?
    No production, <10%, 10-30%, 30-50%, >50%, All production
    a. Sweden
    b. Other Nordic Countries (Norway, Denmark, Finland, Iceland)
    c. Baltics (Estonia, Latvia, Lithuania)
    d. Western Europe (Germany, Austria, Switzerland, Italia and other EU countries in the west)
    e. Central, East and South Europe (Poland, Czech Republic, Slovakia, Hungary and other EU countries in the east)
    f. Eastern Europe outside EU (Belarus, Ukraine, Russia) + Turkey
19. How much of your production is performed in the following European How is the amount of production in the following Asian countries expected to change until 2025?
    Decrease, *unchanged* or *increase*
    a. Sweden
    b. Other Nordic Countries (Norway, Denmark, Finland, Iceland)
    c. Baltics (Estonia, Latvia, Lithuania)
    d. Western Europe (Germany, Austria, Switzerland, Italia and other EU countries in the west)
    e. Central, East and South Europe (Poland, Czech Republic, Slovakia, Hungary and other EU countries in the east)
    f. Eastern Europe outside EU (Belarus, Ukraine, Russia) + Turkey

Page 4: "Decision factors"

20. How important are the following *economic factors* in decisions regarding production location?
    Not important at all, Less important, Important, Very Important
    a. Low labour cost (wages, insurances etc.)
    b. Low transportation cost
    c. Low cost for energy and water
    d. Low risk for currency fluctuations
21. How important are the following *social factors* in decisions regarding production location?
    Not important at all, Less important, Important, Very Important
    a. Good working conditions for production personnel
    b. Existing relationships with producers in the area
    c. Cultural similarities with producers in the area
    d. Good access to competent personnel in the area
    e. That Swedish companies within the same industry produce in the area
22. How important are the following *logistical and technical factors* in decisions regarding production location?
    Not important at all, Less important, Important, Very Important
    a. Closeness to raw material
    b. Short transportation time to market

c. Access to producers with the right technical competence (experience, machines etc.)
d. Well-developed infrastructure (road networks, internet access etc.)

23. How important are the following *political and environmental factors* in decisions regarding production location?
Not important at all, Less important, Important, Very Important
a. Low trade barriers
b. Low risk for political instability or war
c. Environmental awareness in the area (laws controlling pollution etc.)
d. Low risk for natural disasters

24. How important are the previously mentioned categories in decisions regarding production location?
Rank the decisions from 1 to 4, where 1 in most important
a. Economic factors
b. Social factors
c. Logistical and Technical factors
d. Environmental and Political factors

25. How do you think that the importance of the categories will change until 2025?
Decreased importance, unchanged importance, increased importance
a. Economic factors
b. Social factors
c. Logistical and technical factors
d. Political and environmental factors

26 Do you have any other thoughts regarding location decisions, or something from the survey that you would like to clarify? Please write your comment below.

Appendix C: Interview Questions

1. Tell us about Company X - what are your main products?
2. What is your role at Company X and what are your responsibilities?
3. How big is your influence on production location?
4. Where does your company produce today (2015)?
    I. Follow-up questions such as “In what countries on the continent?”
5. How often have you moved your production or changed supplier within the past five years?
    I. Follow-up questions such as “If yes - why have you moved?”
6. In what world continents or countries will you produce in in the year of 2025?
    I. Follow-up questions such as “How come?” or “Is there any specific reason behind that?”
7. What factors are important for company when it comes to decisions regarding production location? (for example Social, Economical etc.)
    I. Follow-up questions such as “What type of factors is most important for your Company?”
8. How do you think that the importance of these factors will change until 2025?
9. Is there anything that you would like do add?

Appendix D: Tables with statistical tests

The mean difference is between the top row and lower row. All samples are independent. Note that some of the tests are shown in other appendices.

P	Data type	Grouping based on	Test type	Groups	Parameter	Mean difference	Sig.
Production in the world continents	Ordinal	TEKO	Non-parametric	I	Europe	1,291	0,001
				F&A			
				I	Asia	-1,384	0,000
				F&A			
		Company size (A)	Non-parametric	All groups	Europe		0,032
				All groups	Asia		0,032
		Company size (B)	Non-parametric	Small & Medium	Asia		0,026
				Large			
		Own production	Non-parametric	Yes	Asia		0,002
				No			
				Yes	Europe		0,001
				No			
		Customers	Non-parametric	No significant differences			
Change of production in the world continents and the different countries	Ordinal	TEKO	Chi-2	See Appendix F			
		Company size (A)	Chi-2	See Appendix F			
		Company size (B)	Chi-2	See Appendix F			
		Own production	Chi-2	See Appendix F			
		Customers	Chi-2	See Appendix F			

Change of production in the world continents	Ordinal	**TEKO**	**Chi-2**	**See separate tables**			
		Company size (A)	**Chi-2**	**See separate tables**			
		Company size (B)	**Chi-2**	**See separate tables**			
		Own production	**Chi-2**	**See separate tables**			
		Customers	**Chi-2**	**See separate tables**			
Production in Asian Countries 2015	Ordinal	**TEKO**	**Non-parametric**	**All groups**	**China**		**0,000**
				All groups	**Bangladesh**		**0,015**
				All groups	**Other Asian Countries**		**0,017**
		Company size (A)	**Non-parametric**	**All groups**	**China**		**0,006**
				All groups	**Bangladesh**		**0,017**
				All groups	**Other Asian Countries**		**0,003**
		Company size (B)	**Non-parametric**	**Small & Medium**	**China**		**0,005**
				Large			
				Small & Medium	**India**		**0,048**
				Large			
				Small & Medium	**Bangladesh**		**0,035**
				Large			
				Small & Medium	**Vietnam**		**0,043**
				Large			
		Own production	**Non-parametric**	**Yes**	**China**		**0,000**
				No			
				Yes	**India**		**0,020**
				No			
				Yes	**Bangladesh**		**0,007**
				No			
		Customers	**Non-parametric**	**Consumers**	**India**		0,003
				Companies			
				Consumers	**Other Asian Countries**		0,002
				Companies			
				Consumers	**Central, East and South Europe**		0,031
				Companies			

Production in European Countries 2015		**TEKO**	**Non-parametric**	**All groups**	**Sweden**		**0,006**
				All groups	**Eastern Europe**		**0,017**
		Company size (A)	**Non-parametric**	**All groups**	**Sweden**		**0,028**
				All groups	**Eastern Europe**		**0,032**
				All groups	**Other Nordic Countries**		**0,048**
		Company size (B)	**Non-parametric**	**Small & Medium**	**Eastern Europe**		**0,022**
				Large			
		Own production	**Non-parametric**	**Yes**	**Sweden**		**0,004**
				No			
				Yes	**Eastern Europe**		**0,012**
				No			
External factors (single factors)	Ordinal	**TEKO**	**ANOVA**	**F&A**	**Competent personnel**	**0,403**	**0,013**
				I			
		Company Size (A)	**ANOVA**	**50-100 million SEK**	**Cultural Similarities**	**0,798**	**0,027**
				> 1 billion SEK			
		Company Size (B)	**t-test**	**No significant differences found**			
		Own production	**t-test**	**No significant differences found**			
		Customers	**ANOVA**	**Consumers**	**Good working conditions**	**0,302**	**0,024**
				Companies			
Change of external factors (single factors)	Ordinal	**TEKO**		**See Appendix G**			
		Company Size (A)		**See Appendix G**			
		Company Size (B)		**See Appendix G**			
		Own production		**See Appendix G**			
		Customers		**See Appendix G**			

Appendix E: Change of production VS. External factors

This Appendix includes a presentation of the results from the analysis where the mean differences between the groups that plan to increase, decrease or not change their production in different areas are compared with the considered importance of external factors.

Africa

The factors that lie behind the decisions regarding production change in Africa were analysed by statistical testing of the mean difference between the groups. Nobody plans to decrease their production in Africa, which gave two different groups for the analysis and an independent samples t-test was used to check the mean difference between these two groups.

External factors

External factor	1. Companies that will increase	2. Companies that will not change	Sig.
Competent personnel	3,500 (2)*	3,236 (1)*	0,031
Environmental awareness	3,115 (2)*	3,407 (1)*	0,026
Low risk for natural disasters	2,680 (2)*	3,000 (1)*	0,054

Asia

The factors that lie behind the decisions regarding production change in Asia were analysed by statistical testing of the mean difference between the groups. The mean difference between three different groups - companies that plan an increase, no change and decrease in Asia - was analysed with one-way ANOVA.

External factors

External factor	1. Companies that will increase	2. Companies that will not change	3. Companies that will decrease	Sig.
Low risk for currency fluctuations	3,094 (2)*	2,714 (1)*	3,000	0,032
Low risk for natural disasters	2,677 (2)*	3,061 (1)*	3,000	0,036

China

External factors

External factor	1. Companies that will increase	2. Companies that will not change	3. Companies that will decrease	Sig.
Low risk for political instability	3,00 (2)*	3,472 (1)*	3,341	0,015
Low risk for natural disasters	2,533 (2)*	3,039 (1)*	2,954	0,033

External factor groups

External factor	1. Companies that will increase	2. Companies that will not change	3. Companies that will decrease	Sig.
Logistical and technical factors	1,933 (3)**	2,340 (3)*	2,889 (1)** (2)*	0,004 (1, 3) 0,017 (2, 3)

1 is the highest value, 4 is the lowest

Bangladesh

External factor group	1. Companies that will increase	2. Companies that will not change	3. Companies that will decrease	Sig.
Economical factors	1,960 (2)*	1,405 (1)*	1,333	0,038

1 is the highest value, 4 is the lowest

External factor	1. Companies that will increase	2. Companies that will not change	3. Companies that will decrease	Sig.
Good working conditions	3,649 (3)**	3,469 (3)**	2,333 (1)** (2)**	0,002 (2,3) 0,000 (1,3)
Existing relation	3,243 (3)*	3,143 (3)*	2,000 (1)* (2)*	0,021 (2,3) 0,012 (1,3)
Short transportation time	2,400 (2)**	2,860 (1)**	3,333	0,010
Economical factors	1,960 (2)*	1,405 (1)*	1,333	0,038

Vietnam

External factor group	1. Companies that will increase	2. Companies that will not change	3. Companies that will decrease	Sig.
Political and environmental	3,000 (3)*	3,414	4,000 (1)*	0,043

1 is the highest value, 4 is the lowest

External factor	1. Companies that will increase	2. Companies that will not change	3. Companies that will decrease	Sig.
Good working conditions	3,571 (2)** (3)**	3,544 (1)**	2,857 (1)**	0,011 (1,2) 0,012 (1,3)
Existing relation	3,250 (2)** (3)**	3,228 (1)**	2,286 (1)**	0,003 (1,2) 0,004 (1,3)

Pakistan

No significant differences

Taiwan

Independent t-test. No significant differences and only 3 companies will increase.

Other Asian Countries

External factor	1. Companies that will increase	2. Companies that will not change	3. Companies that will decrease	Sig.
Good Working conditions	3,773 (3)**	3,481	3,000 (1)**	0,004
Existing relation	2,750 (3)*	3,111	3,500 (1)*	0,027
Low risk for natural disasters	2,952	2,982 (3)*	2,375 (2)*	0,049

India

External factor	1. Companies that will increase	2. Companies that will not change	3. Companies that will decrease	Sig.
Low risk for currency fluctuations	2,875	2,879 (3)*	3,500 (2)*	0,033
Presence of other Swedish companies	1,688 (3)* (2)*	1,687 (1)*	2,500 (1)*	0,011 (1,2) 0,034 (1,3)

Europe

The factors that lie behind the decisions regarding production change in Europe were analysed by statistical testing of the mean difference between the groups. The mean difference between three different groups - companies that plan an increase, no change and decrease in Europe - was analysed with one-way ANOVA. No significant differences were found four the continent as a whole.

Sweden

External factor	1. Companies that will increase	2. Companies that will not change	3. Companies that will decrease	Sig.
Short transportation time	3,048 (2)*	2,609 (1)* (3)*	2,333 (2)*	0,018 (1,2) 0,021 (2,3)

Among companies that will increase their production in Sweden, the

Baltic countries

External factor group	1. Companies that will increase	2. Companies that will not change	3. Companies that will decrease	Sig.
Social factors	2,154 (3)*	2,357	3,000 (1)*	0,022

1 is the highest value, 4 is the lowest

External factor	Companies that will increase	Companies that will not change	Companies that will decrease	Sig.
Good working conditions	3,640 (3)*	3,518	3,091 (1)*	0,024

Eastern Europe

External factor	Companies that will increase	Companies that will not change	Companies that will decrease	Sig.
Low cost for energy and water	2,560	2,463 (3)*	3,167 (2)*	0,029
Low risk for currency fluctuations	2,921 (3)*	2,811 (3)**	3,667 (2)** (1)*	0,005 (2,3) 0,020 (1,3)
Short transportation time	2,595 (3)*	2,704	3,333 (1)*	0,046
Infrastructure	3,081 (3)*	3,093 (3)*	3,667 (2)* (1)*	0,028 (2,3) 0,029 (1,3)

External factor group	Companies that will increase	Companies that will not change	Companies that will decrease	Sig.
Change of Social factors	0,737 (2)* (3)*	0,574 (1)*	0,000 (1)*	0,027 (1,2) 0,004 (1,3)

Western Europe

No significant differences were found.

Appendix F: Change of production VS. internal and external factors

In this appendix the findings from the analysis of internal and external characteristics is compared to the decisions to increase or decrease production in different geographical areas. The statistical analysis consisted of Chi square tests and only results with significant differences are shown. Some cells in the tables are left empty, which means the number of companies within that group are too few in order to draw any conclusions based on the statistical analysis.

Asia

Importance of closeness between production and head office
Pearson Chi-Square, Significance: **0,028**

Name	Description	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Not important at all	46,2	
2	Less important	28,2	
3	Important	19	
4	Very important	18,2	

Importance of closeness between production and warehouse
Pearson Chi-Square, Significance: **0,001**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Not important at all / Less important	35,4	29,2
2	Important / Very important	19	21,4

Manufacturing companies and Retail companies
Pearson Chi-Square, Significance: **0,048**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Manufacturing companies	38,3	14,9
0	Retail companies	22,6	33,9

Type of customers
Pearson Chi-Square, Significance: **0,011**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
	Consumers	15,4%	35,9%
	Companies	37,5%	17,9%
	Government Agencies		

China

TEKO-group

Pearson Chi-Square, Significance: **0,036**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
F&A	Fashion and apparel	-	**47,3**
I	Interior*	-	-
T	Technical*	-	-

*The majority of the companies within these groups did not believe in any change.

Importance of closeness between production and warehouse: **0,018**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Not important at all		23,3
2	Less important		32,4
3	Important		54,8
4	Very important		52,9

Importance of closeness between production and head office

Classification 1: Pearson Chi-Square, Significance: **0,001**

Classification 2: Pearson Chi-Square, Significance: **0,002**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Classification 1			
1	Not important at all		52
2	Less important		51,2
3	Important		31,8
4	Very important		16,7
Classification 2			
1	Not important at all / Less important	15,2	51,5
2	Important / Very important	8,9	24,4

Individual external factors

Pearson Chi-Square, Significance: **0,050**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Infrastructure			
3	Important	17,7	39,2
4	Very important	4,3	26,1

Bangladesh

Company size

Company size (B) Pearson Chi-Square, Significance: **0,020**

Company size (A) Pearson Chi-Square, Significance: **0,037**

Name	Description: [Turnover SEK]	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Company size (B)			
Small and medium sized	<100 M	24,3	
Large	>100 M	52,8	
Company size (A)			
1	<20 M	0	
2	20-50 M	18,8	
3	50-100 M	41,2	
4	100 M-1 BN	51,2	
5	>1 BN	66,7	

Importance of closeness between production and design

Classification 1: Pearson Chi-Square, Significance: **0,045**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Classification 1			
1	Not important at all	76,9	
2	Less important		
3	Important		
4	Very important	21,1	
Classification 2			

Number of moves within the past five years
Classification 1: Pearson Chi-Square, Significance: **0,030**
Classification 2: Pearson Chi-Square, Significance: **0,028**

Name	Description: [Number of moves]	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Classification 1			
	0	17,6	
	1-2	52,4	
	3-5	50	
	>5	60	
Classification 2			
1	0-2	30,9%	
2	>3	57,1%	

Manufacturing companies and retail companies
Pearson Chi-Square, Significance: **0,026**

Name	Description	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Manufacturing companies	26,2	4,8
0	Retail companies	54,2	2

Desired capabilities 2015
Pearson Chi-Square, Significance: **0,039**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Low cost			
0	Did not choose this	33,8	4,4
1	Did choose this	63,6	0

Individual external factors
Good working conditions: Pearson Chi-Square, Significance: **0,000**
Short transportation time: Pearson Chi-Square, Significance: **0,001**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Good working conditions			
3	Important	33,3	5,1
4	Very important	50	0
Short transport time			
2	Less important	65,6	3,1
3	Important	26,2	0
4	Very important	18,2	18,2

Other Asian countries

Company size

Company size (B) Pearson Chi-Square, Significance: **0,043**

Company size (A) Pearson Chi-Square, Significance: **0,004**

Name	Description: [Turnover SEK]	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Company size (B)			
Small and medium sized	<100 M	11,8	
Large	>100 M	35,3	
Company size (A)			
	<20 M	0	
	20-50 M	7,1	
	50-100 M	20	
	100 M-1 BN	26,2	
	>1 BN	87,5	

TEKO-group

Pearson Chi-Square, Significance: **0,006**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
	Fashion and apparel	36,4	
	Interior*	0	
	Technical*	11,1	

*The majority of the companies within these groups did not believe in any change.

Importance of closeness between production and market

Pearson Chi-Square, Significance: **0,030**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Not important at all / Less important	31,8	14,9
2	Important / Very important	18,4	2,6

Importance of closeness between production and design
Pearson Chi-Square, Significance: **0,031**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Not important at all / Less important	33,3	16,7
2	Important / Very important	20,4	4,1

Importance of closeness between production and head office
Pearson Chi-Square, Significance: **0,015**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Not important at all / Less important	34	14
2	Important / Very important	14,7	2,9

Number of moves within the past five years
Classification 1: Pearson Chi-Square, Significance: **0,002**
Classification 2: Pearson Chi-Square, Significance: **0,002**

Name	Description: [Number of moves]	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Classification 1			
	0	3,3	
	1-2	27,3	
	3-5	50	
	>5	43,3	
Classification 2			
1	**0-2**	**13,5**	7,7
2	**>3**	**45,5**	12,1

Individual external factors
Pearson Chi-Square, Significance: **0,010**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Good working conditions			
3	Important	13,9	13,9
4	Very important	37	4,3

Type of customers
Pearson Chi-Square, Significance: **0,002**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
	Consumers	46,7%	
	Companies	11,8%	
	Government Agencies		

Vietnam
Number of moves within the past five years
Pearson Chi-Square, Significance: **0,039**

Name	Description: [Number of moves]	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Classification 2			
1	**0-2**	**20,7**	8,6
2	**>3**	**45,7**	5,7

Owns part of production or not
Pearson Chi-Square, Significance: **0,021**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Manufacturing companies	16,3	7
0	Retail companies	42	8

Pakistan
Number of moves within the past five years
Pearson Chi-Square, Significance: **0,002**

Name	Description: [Number of moves]	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Classification 2			
1	0-2	3,9	13,7
2	>3	30,3	3

Europe
Importance of closeness between production and warehouse
Pearson Chi-Square, Significance: **0,007**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Not important at all	40	
2	Less important	57,6	
3	Important	60,6	
4	Very important	73,3	

Importance of closeness between production and market
Pearson Chi-Square, Significance: **0,033**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Not important at all / Less important	53,2	9,7
2	Important / Very important	71,4	0

External factors groups
Pearson Chi-Square, Significance: **0,024**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Social factors			
1	Very important	82,4	5,9
2	Important	45,7	6,5
3	Less important	76,3	5,3
4	Not important at all	40	0

Eastern Europe (outside EU) and Turkey
TEKO-group
Pearson Chi-Square, Significance: **0,001**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
	Fashion and apparel	48,5	0
	Interior		
	Technical	35,3	

Desired capabilities 2015
Pearson Chi-Square, Significance: **0,012**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
High quality			
0	Did not choose this	29,1	10,9
1	Did choose this	52,3	0

Individual external factors
Pearson Chi-Square, Significance: **0,035**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Short transport time			
2	Less important	35,3	2,9
3	Important	44,9	4,1
4	Very important	9,1	27,3

Type of customers
Pearson Chi-Square, Significance: **0,011**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
	Consumers	47,1%	
	Companies	37,1%	
	Government Agencies		

Central Europe
Customer value
Pearson Chi-Square, Significance: **0,020**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
High service			
0	Did not choose this	42,6	
1	Did choose this	20	

Number of moves within the past five years
Pearson Chi-Square, Significance: **0,030**

Name	Description: [Number of moves]	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Classification 2			
1	0-2	26,2	6,6
2	>3	52,8	5,6

Desired capabilities 2015
Pearson Chi-Square, Significance: **0,020**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
High flexibility (towards customers)			
0	Did not choose this	40,5	2,7
1	Did choose this	20,8	16,7

Sweden

Importance of closeness between production and market

Pearson Chi-Square, Significance: **0,029**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Classification 1			
1	Not important at all	13	
2	Less important	17,6	
3	Important	22,2	
4	Very important	35,3	

,

Importance of closeness between production and warehouse

Pearson Chi-Square, Significance: **0,022**

Name	Description	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Not important at all / Less important	11,9	16,7
2	Important / Very important	27,6	3,4

Number of moves within the past five years

Pearson Chi-Square, Significance: **0,010**

Name	Description: [Number of moves]	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Classification 2			
1	0-2	30,6	8,1
2	>3	5,3	10,5

Manufacturing and retail companies

Pearson Chi-Square, Significance: **0,006**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
1	Manufacturing companies	34,8	6,5
0	Retail companies	9	10

The Baltics countries

Individual external factors

Pearson Chi-Square, Significance: **0,035**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Good working conditions			
3	Important	22	
4	Very important	32	

External factors groups
Pearson Chi-Square, Significance: **0,002**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Social factors			
1	Very important	64,3	7,1
2	Important	19,4	0
3	Less important	21.2	24,2
4	Not important at all	33.3	22,2

Africa

External factor groups
Pearson Chi-Square, Significance: **0,016**

Name	Description:	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Political and environmental factors			
1	Very important	16,7	0
2	Important	20	20
3	Less important	20	0
4	Not important at all	38,2	0

Appendix G: Internal factors VS. change of external factors

The predicted change of importance of the external factors until 2025 were analysed against the internal factors. The only significant differences were observed for the change of political and external factors and are shown in the table below.

Change of political and environmental factors

Name	Description: [Turnover SEK]	Increase, share of companies within group [%]	Decrease, share of companies within group [%]
Company size (A) Pearson Chi-Square, Significance: **0,001**			
	<20 M	28,6%	
	20-50 M	56,5%	
	50-100 M	59,3%	
	100 M-1 BN	70,0%	
	>1 BN	44,4%	
Company type Pearson Chi-Square, Significance: **0,017**			
F&A	Fashion and apparel	67,5%	
I	Interior*	37,5%	
T	Technical*	52,2%	

Appendix H: Change of production in different countries

The current production locations for the companies were compared to where the companies plan to increase production until 2025. The results are presented according to where the companies plan to increase, and only results with significant differences are presented.

Bangladesh

The largest share of companies that believe in an increase of production can be found among the companies that produce in Asia today. A large share of companies producing in China today, plan to increase production in Bangladesh. 35,3% of all companies produce in Bangladesh today, and out of those only 2,4% believe in a decrease of production.

Production location 2015	Share of total production	Total number of companies	Increase in Bangladesh, share of companies within group [%]
Bangladesh	No production	48	14,6
	<10%	22	**59,1**
	10-30%	11	**90,9**
	30-50%	5	**80**
China	No production	20	0
	<10%	12	8,3
	10-30%	14	42,9
	30-50%	13	**69,2**
	>50%	29	**69**
India	No production	53	14
	<10%	25	**68**
	10-30%	11	**54,5**
Sweden	No production	46	**54,3**
	<10%	27	37
	10-30%	4	50
	>50%	5	0
	All production	8	0
Europe	No production	12	**66,7**
	<15%	19	**73,7**
	15-50%	23	**56,5**
	>50%	18	11,1
	All production	18	0
Asia	No production	20	0
	<15%	9	0
	15-50%	16	18,8
	>50%	33	**78,8**
	All production	12	**66,7**

7.1. Vietnam

Production location 2015	Share of total production	Total number of companies	Increase in Vietnam, share of companies within group [%]
Vietnam	No production	17	23,9
	<10%	10	30
	10-30%	8	**75**
China	No production	21	4,8
	<10%	12	8,3
	10-30%	18	27,8
	30-50%	11	**54,5**
	>50%	29	**48,3**
Europe	No production	10	**60**
	<10%	20	**50**
	10-50%	24	33,3
	>50%	20	15
	All production	19	5,3
Asia	No production	21	4,8
	<10%	9	0
	10-50%	19	31,6
	>50%	34	44,1
	All production	10	**60**

7.1.1. Other Asian Countries

Production location 2015	Share of total production	Total number of companies	Increase in Other Asian Countries, share of companies within group [%]
Other Asian Countries	No production	63	19
	<10%	15	40
	10-30%	5	40
China	No production	19	5,3
	<10%	13	7,7
	10-30%	15	20
	30-50%	10	**50**
	>50%	27	44,4
India	No production	51	19,6
	<10%	23	39,1
	10-30%	8	25
	30-50%	2	**50**
Europe	No production	8	25
	<10%	17	41,2
	10-50%	24	41,7
	>50%	19	10,5
	All production	17	5,9
Asia	No production	18	5,6
	<10%	9	0
	10-50%	19	21,1
	>50%	31	48,4
	All production	8	25

7.1.2. India

Production location 2015	Share of total production	Total number of companies	Increase in India, share of companies within group [%]
India	No production	47	10,6
	<10%	28	17,9
	10-30%	11	45,5

7.1.3. China

77,3% of all companies produce in China today, and out of those **47,8%** plan to decrease their production in China.

Production location 2015	Share of total production	Total number of companies	Increase in China, share of companies within group [%]
Vietnam	No production	91	15,4
	<10%	10	10
	10-30%	8	6,7
Europe	No production	17	5,9
	<15%	22	4,5
	15-50%	31	9,7
	>50%	23	21,7
	All production	20	25
Asia	No production	24	20,8
	<15%	10	30
	15-50%	24	12,5
	>50%	40	7,5
	All production	15	6,7

7.1.4. Taiwan

Production location 2015	Share of total production	Total number of companies	Increase in Taiwan, share of companies within group [%]
Taiwan	No production	71	0
	<10%	9	33,3
Vietnam			

7.1.5. Pakistan

Production location 2015	Share of total production	Total number of companies	Increase in Pakistan, share of companies within group [%]
South Korea	No production	81	10
Pakistan			

7.1.6. Western Europe

Production location 2015	Share of total production	Total number of companies	Increase in Western Europe, share of companies within group [%]
Western Europe	No production	51	2
	<10%	23	17,4
	10-30%	8	37,5
South Korea	No production	85	9,4
	<10%	8	50

7.1.7. Eastern Europe (outside EU) + Turkey

Production location 2015	Share of total production	Total number of companies	Increase in Eastern Europe, share of companies within group [%]
Eastern Europe	No production	53	30,2
	<10%	20	55
	10-30%	15	73,3
	30-50%	7	0
Pakistan			
Other Asian Countries	No production	77	39
	<10%	16	56,3

7.1.8. Africa

Production location 2015	Share of total production	Total number of companies	Increase in Africa, share of companies within group [%]
Other Asian Countries	No production	65	24,6
	<10%	14	71,4
Sweden	No production	42	28,6
	<10%	45	44
	>50%	5	0
	All production	6	33,3

7.1.9. Sweden

Production location 2015	Share of total production	Total number of companies	Increase in Sweden, share of companies within group [%]
Sweden	No production	46	4,3
	<10%	32	21,9
	10-30%	5	20
	>50%	7	42,9
	All production	10	80
Europe	No production	9	0
	<15%	20	30
	15-50%	29	10,3
	>50%	21	9,5
	All production	22	45,5

Appendix G: Participating companies in the additional interviews

This section contains a presentation of the interview cases, the companies that participated in the additional interviews. A short presentation about their current situation regarding location of production in the world today as well as their change of production plans until 2025 are available below. All companies are chosen based on the identified tendencies from the analysis of the survey, were a company has to represent at least one of the following tendencies:

- Increase of production in Africa
- Increase of production in Europe
- Increase/Decrease of production in Asia
- Decrease of production in China

Company A
The company A's main products are protective apparel products. Today they are mainly producing in Asia but also have some parts of their production in Europe. In the future they plan to decrease their production in Europe and increase their production in Asia. However, the vision is to decrease production share in China but instead increase production in Bangladesh, Vietnam and in other parts of Asia.
Tendencies: Increase of production in Asia, Decrease of production in China

Company B
Company B is a work wear company that today have the main part of their production in China in Asia. They also produce in the Baltic countries in Europe, but plan to increase their production in Europe until 2025. Their production share in Asia will probably remain almost unchanged in the future, though they plan to move production from China to other countries in Asia.
Tendencies: Increase of production in Europe, Decrease of production in China

Company C
Company C is an apparel company with underwear as their main product. Today their production is located in Europe and Asia. In Europe they produce in Sweden and Eastern Europe (outside EU) & Turkey and they plan to increase their production share in the eastern, central and Baltic parts of Europe in the future. Regarding Asia, they are today producing in China, but they plan to decrease production there and instead start to produce in other countries within Asia until 2025.
Tendencies: Decrease of production in China, Increase of production in Europe

Company D
Company D is a shoe company. Today they only produce in Asia, mainly in Vietnam but also in China. Until 2025, they plan to decrease their production in Vietnam and instead increase in Europe with focus on the central parts of Europe.
Tendencies: Decrease of production in Asia, Increase of production in Europe

Company E
Company E produce apparel and today they have all of their production located in different parts of Europe. Their prediction for the future is an increase of production in Central Europe, but they also have plans to start to produce in Africa.

Tendencies: Increase of production in Europe, Increase of production in Africa

Company F

Company F's main products are outdoor apparel. Today they have their largest production share in Asia, China and Vietnam, but they also produce in Europe, Western Europe and the Baltic countries. Until 2025, they plan to increase production in Africa and as they plan to decrease production in China, they will increase in other countries such as Bangladesh and Vietnam. In Europe they predict an increased production share in Central Europe and Eastern Europe (outside EU) & Turkey.

Tendencies: Decrease of production in China, Increase of production in Europe, Increase of production in Africa