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# **Outsourcing and Reshoring, a comparison between Far-East and new technologies**

The case of Trademark Textiles A/S

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*To my family,  
who always supports me.*

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## ***INTRODUCTION***

In the last decades technological advances had a strong impact on the mechanisms that used to drive the society and companies' structures. In fact, at the beginning of the new Millennium, the industry faced the third wave of globalization powered by the spread of internet connecting people all over the world and disrupting a lot of barriers between different countries, allowing a global integration of value chains: a company was able to have different activities in different countries.

During this period many companies started to outsource the manufacturing especially in low-cost countries such as Far-East countries, in order to exploit the competitive advantage of this strategy aiming to create a new knowledge that could not be replicated by competitors.

More recently, industrial technological advances led to the fourth industrial revolution that saw the digitalization of the processes and the introduction of intelligent products. This phenomenon forced companies to re-think about their role in the industry and Western countries started developing advanced manufacturing techniques able to face this new wave of changing with less labor-intensive process; thus, they started to reshore the production process to the home country where they could exploit the tools provided by the new era of automation.

The aim of this thesis is to analyze the dynamics behind outsourcing and reshoring considering their drivers, strengths and weaknesses, with particular attention to the apparel industry, in order to give a general overview and to identify possible strategic plans to follow in the future that will enable companies to exploit even more the automation they have at their disposal. With these tools at hand, I am going to analyze a Danish SME Trademark Textiles A/S specialized in the apparel industry, that has outsourced all its

production processes to China, in order to understand if and how a reshoring strategy is possible to be adopted.

The thesis starts giving an overview of the fourth industrial revolution underling its impact on globalization, as it is changing the production process concept: economies of scale are being replaced by smart factories that produce smart products and smart services embedded in an Internet of Things (IoT): companies are becoming digital conglomerates. The first chapter is divided into the analysis of the two phenomenon of outsourcing and reshoring underlying reasons and risks of both of them as well as the approaches adopted to location decisions during the former strategy, showing that there are many reasons that companies take into consideration when they decide to outsource related also to the host country, even though the very first key driver to outsource manufacturing remains cost advantages.

Furthermore, the analysis of reshoring shows that even though there are many advantages when companies adopt this strategy, they do not consider risks related to it. Also, workers are afraid to be replaced by machines and at the same time there are not enough highly specialized workers who are able to use the new technologies in the most profitable way. There are also other risks related to the reshoring such as the risk of not being able to provide new knowledge and to exploit the international know-how, as well as, losing access to foreign markets and distribution channels.

The second chapter regards the automation adopted in the apparel industry. Through an analysis of the actual scenario, it is going to be underlined which are the main key factors that drive the reshoring in this industry, such as shorter lead time, automation of the production process, organizational flexibility and so on; on the other hand, obviously, there are also some challenges that need to be faced. Furthermore, the impact of automation in the apparel industry has a fundamental role, even though the shift is slower than in other industries, meaning that there is still margin of implementation especially in the sewing and intralogistics step of the entire process. Once the process will be entirely automated, labor time will be drastically reduced. Finally, in the future, companies should move fast toward the adoption of this new model of sourcing and at the same time being able to have

capable people to deal with the complexity of this new approach and to create a network of partnerships.

The third chapter focuses on the sector analysis that I have decided to take into consideration: the hosiery sector, which involves a complex supply chain and its main players are Europe, Middle East and Far East. The analysis shows that the choice of most companies of this industry to outsource the production process is the Far-East countries, especially China which has a strong power in the market; and according to the analysis, the most attractive country instead to reshore the manufacturing production is Europe, more specific Italy that is the third biggest exporter at worldwide level in the hosiery sector. After a description of the hosiery production process, the chapter focuses on the phases that socks manufacturers are more inclined to outsource. The chapter then continues with the analysis of the two countries mentioned above, China and Italy, where it is possible to find in both of them a hosiery industrial cluster: Datang district in China and Castel Goffredo's district in Italy, both specialized in the production of socks and tights. The comparison aims to focus on the similarities and differences of the two clusters in order to understand the competitive advantage they have in the market.

The fourth chapter regards the case study about Trademark Textiles A/S, a Danish private label specialized in the production of socks and underwear. Between its customers there is also the company Alfa A/S which is a Danish family-owned fashion firm with a strong presence in the international scenario. With a range of more than 20 individual fashion brands, it provides fashion clothing and accessories for women, men, teenagers and children, even though the study is going to take into consideration one brand that I am going to call Beta. Between its suppliers, the analysis focuses on Trademark Textiles A/S, which provides mostly socks and tights to Alfa A/S and so to its brand Beta. Its business model is based on the outsourcing of all the production processes related to socks and tights to China, in Datang district. After a description of the factory selection and the requirements needed in order to be considered suitable by Trademark Textiles A/S, the study will focus on the production process outsourced to the Chinese factories, taking into consideration its strengths and weaknesses, the order processes, the MOQ, prices, capacity, lead time which are the key driver in the choice of a factory.



After that, the study continues with an analysis of a possible reshoring to Italy, in Castel Goffredo's district. Through interviews I have made to employees of Trademark Textiles and to Italian factories in the district, collecting data concerning the actual Chinese socks suppliers and the potential Italian ones, the thesis aims to understand if the reshoring strategy can be effective to be adopted by Trademark Textiles A/S: the study takes into considerations some Italian factories and through the analysis of key drivers and strength and weaknesses, it will be possible to establish the success or unsuccess of reshoring applied to the hosiery sector. The most critical aspect is going to be the price difference between the two countries as Alfa A/S strategy is mostly based on price saving, but Italian factories have some key points that might be successful factors for Alfa A/S to gain competitive advantage in the market and might be a valid reason to reshore the production process. In fact, price is not the only driver in the decision-making, also other aspects have to be taken into consideration, such as lead time, the flexibility of the organization, the machines adopted, the relationship that might be established.

## ***Chapter 1: LITERATURE REVIEW***

### **1. AN OVERVIEW OF THE FOURTH INDUSTRIAL REVOLUTION SCENARIO**

Technological advances have driven dramatic increases in industrial productivity since the rise of the Industrial Revolution: the steam engine powered factories in the nineteenth century leading to the spread of multinational companies; electricity brought to mass production in the early part of the twentieth century and industry became automated in the 1970s. Around 2000s, the industry faced the third wave of globalization which was powered by the spread of internet connecting people all over the world in a more direct way. Besides, it allowed a further global integration of value chains: a company, for the first time, could have R&D in one country, sourcing in others, production in yet one another and distribution all over the world; in fact, in the 2000s, global exports reached a milestone as they rose to about a quarter of global GDP.

More recently, industrial technological advancements led to the fourth industrial revolution that saw the development of innovations such as IT, mobile communications, e-commerce and the digitalization of processes.

In this paragraph I am going to make a brief overview regarding the industry 4.0 phenomenon, its impact on globalization and I am going to study the consequences that this new condition has on manufacturing process in order to be able to understand the shift from outsourcing to reshoring that many firms are experiencing nowadays.

#### **1.1 The Fourth Industrial Revolution phenomenon**

Industry 4.0 is defined as the fourth wave of technological advancement that is driven by nine technological advances that are able to increase manufacturing productivity and the

competitiveness in manufacturing industries. According to the Boston Consulting Group (BCG), in this transformation, sensors, machines, workpieces and IT systems will be connected along the value chain beyond a single enterprise. These systems can interact with one another in order to predict failures, configure themselves and adapt to changes. According to Rüßmann et al. (2015), Industry 4.0 will make possible to gather and analyse data across machines, enabling faster, more flexible and more efficient processes to produce higher-quality good at reduced costs.

According to Brettel et al. (2014), Industry 4.0 focuses on the establishment of intelligent products and production processes, so in the future factories have to cope with the need of rapid product development, flexible production and complex environments. Manufacturing systems are updated to an intelligent level, they take advantage of advanced information and manufacturing technologies to achieve flexible, smart and reconfigurable processes in order to address a dynamic and global market (Zhong et al., 2017).

The Industry 4.0 is characterized by many advances in technology that combined together, they transform the production: isolated, optimized cells will come together as a fully integrated, automated and optimized production flow, leading to greater efficiencies and changing traditional production relationships among suppliers, producers and customers, as well as between human being and machines (Rüßmann et al., 2015).

The first innovation regards big data and analytics which are used to optimizes production quality, saves energy and improve equipment service; in the future they may become standard to support daily real-time decision making. Autonomous robots are the second big innovation of industry 4.0: they were already used in the past, but nowadays they are becoming more flexible and autonomous, in the long-run they may work side by side with humans and learn from them. The advantage is that they will cost less and have a greater range of capabilities than those used in manufacturing today.

Furthermore, 3-D simulations of products and production processes are changing the traditional manufacturing view; in fact, it allows operators to test and optimize both the machine settings and products features in the virtual world before than in the real one.

Horizontal and vertical system integration let companies, suppliers and customers to be closely linked and universal data-integration networks evolve and enable truly automated

value chains. In fact, with the fourth industrial revolution there is also the introduction of the *Industrial Internet of things* which means that more devices are enriched with embedded computing and connected using standard technologies, allowing field devices to communicate and interact with one another and with more centralized controllers. Additionally, as the need to protect critical industrial systems from cybersecurity threats have increased dramatically, reliable communications and sophisticated identity and access management of machines have become essential.

## **1.2 Industry 4.0 impact on globalization**

Nowadays, the fourth industrial revolution is changing the way that individuals relate to one another and to the world at large; in this era, economies, businesses, communities and politics are being fundamentally transformed. If in the decades after 1945, the world's economies underwent an ambitious process of integration lowering barriers in any way, now the engine of globalization seems to be slowing down. According to Schwab (2019), the real issue is that the production and exchange of physical goods matters less and less each year, due to the fact that, in the global economy, competitive advantage will find its strength not on low-cost production anymore, but on the ability to innovate, robotize and digitalize.

In this world, globalization did not disappear, but it has deepened: if in the past global integration grew as trade barriers came down, now it relies on the connectivity of national digital and virtual systems and the related flow of ideas and services. This is the core of Globalization 4.0. For instance, in less than 25 years, Amazon grew from a startup e-commerce store to the world's second-largest trade company, revolutionizing retail, cloud computing and other web services.

In this new era of globalization, economies of scale have been replaced by limitless network effects and tech companies are becoming digital conglomerates disrupting traditional business. At the same time, as economies of scale are disappearing and robots are replacing humans, companies do not need hundreds of employees to run their operations anymore; today, the personnel that is employed is highly skilled or very low skilled and the result is

that the middle class, once the connecting tissue of society, is getting thinner and social cohesion is suffering.

### **1.3 How industry 4.0 is changing manufacturing**

As mentioned above, industry 4.0 has changed the traditional concept of manufacturing process establishing smart factories, smart products and smart services embedded in an Internet of Things (IoT) and services called also industrial internet (Stock and Seliger, 2016). Smart manufacturing enables all physical processes and information flows to be available when and where they are needed across supply chains, multiple industries, SMEs and large companies. For these reasons, industry 4.0 has a huge impact on manufacturing at different levels (Qin et al., 2016).

At factory level, there is going to be a new integrative system where all manufacturing resources are connected and information are exchanged automatically; on the other hand, the factory will become conscious and smart enough to control the production and to predict and maintain machines.

At business level, industry 4.0 implies a complete communication network between companies, factories, suppliers, logistics, resources, customers, etc.

At products level, there will be a new type of products embedded with sensors and processors which carry information and knowledge and transmit the feedback to the manufacturing system.

At customer level, there are many advantages such as a new purchasing method which enables mass customization and it is based on ordering whatever function of products, with any number as well as change their orders at the last minute with no charges.

Obviously, as any other phenomenon, also industry 4.0 has its own dark side. According to the World Economic Forum (2016), the disappearance of frontiers between the virtual and real world brings new fragilities and so far society has not caught the scenarios that such innovations allow, it cannot yet realize what the world is facing and it is underestimating the risks of a connected world, while unaware of the nature and diversity of threats.

To be able to succeed in this digital revolution people need to learn how to deal with asymmetric nature of conflict and business; this implies a need of broader skills and

capabilities to monitor, analyze and react to threats in real time. Preparing for this unprecedented situation requires mobilization of minds and resources, not only at managerial level, but also at every employee and citizen level: they need to be well-trained in order to deal with new technologies and innovations.

Furthermore, with industry 4.0, also the perception of workforce has been affected. In the era of digitalization, disruption is not referred only to technology, products and services, but also to workforce: it requires manufacturers to make huge efforts to invest in talents who own cognitive abilities, high-trained skills and technical aptitudes in order to be able to leverage the new technologies and adapt to their implications.

According to the World Economic Forum (2017), many people have the fear that with the fourth industrial revolution, the change may be so fast and its impact so uneven and disruptive that it may threaten not only individual livelihoods but also the stability of society itself. The workforce feels threatened by the use of automation, fearing the loss of its job because of a robot or a machine, as many companies had to lay off hundreds of people because they do not need their skills and competences anymore. On the other hand, for companies is hard to find high-skilled human capital availability because of the lack of right training. In this sense, companies, governments and universities have to make an effort in order to solve this problem providing programs able to train and prepare students to the new era of technological innovation developing high-skilled competences; as well as, continuous uptraining should be organized for employees in order to acquire the new skills needed in the digital world. Eventually, the adoption of these new workforce management technologies, supported by workers' unique characteristics able to fully exploit the new conditions, will certainly provide a business competitive advantage to companies.

#### **1.4 The shift from outsourcing to reshoring**

According to Johnston (2012), more than a decade after many manufacturing companies started moving their production operations to lower-cost countries, such as China, the industry is again shifting to another global phenomenon called reshoring, and many of the outsourcing cost advantages that once used to be captivating for companies, are starting

to erode. He pointed out that many manufacturers underestimated the outsourcing impacts in the long run and some hidden costs such as necessary costs to support the long-distance supply chain and to maintain service levels, far outweigh any labor cost advantage. Furthermore, according to The Economist (2013), the shift from outsourcing to reshoring is also due to the fact that, the wages in low-cost countries have increased; in fact, the International Labor Organization has pointed out that real wages in Asia between 2000 to 2008 rose by 7,1-7,8% a year. One solution could be to outsource the production to other low-cost countries in the Far-East, but the skills and productivity of the workforce there does not nearly match China`s and they are already asking for better rights and higher wages. For these reasons, the decision to outsource the production in the Far-East countries thus, is becoming more and more tricky.

On the other hand, with the advent of the fourth industrial revolution, Western countries are developing advanced manufacturing techniques able to alter the economics of production, making it a far less labor-intensive process. Cheaper, more user-friendly and more dexterous robots have been spreading into factories around the world and the cost is the same for both Far-East and Western countries. This is giving to companies the opportunity of a different solution: reshoring the production process to the home country where they can exploit the tools provided by the new digitalization era and at the same time, they can avoid the issues mentioned above related to outsourcing the production to low-cost countries.

Obviously, there are many tricky matters related to both outsourcing and reshoring that need to be analyzed deeper such as the reasons and the risks of these strategies that companies should take into consideration when they decide to outsource or to re-shore the production process.

Furthermore, it is important to consider that a company can experience reshoring only once it has outsourced an activity; but, on the other hand, it may also experience both outsourcing and reshoring at the same time, depending on the circumstances, time, outsourcing and reshoring country, costs and many other variables that the company must be aware of, once it decides to outsource or to re-shore.

So far, I gave an overview of the environment we are living in today considering the changes that the fourth industrial revolution implies; it does not mean that this new reality has no risks and disadvantages as well as that the previous era dominated by outsourcing is completely vanished nor it has still advantages for companies. For these reasons, in the next paragraphs, I am going to analyze both the phenomenon of outsourcing and reshoring, in order to come up with a more shaped awareness of the dynamics that are leading the international framework nowadays.

## 2. THE OUTSOURCING PHENOMENON

Outsourcing is a phenomenon that has originated in the 1950s, but it became widely adopted just in the 1980s. Since then outsourcing has become a trend in many industries, especially in logistics and supply chain management; its scope is continuing to grow, as companies focus on their core competencies and choosing a third party or an outside supplier to perform a task, function, or process perceived as noncore (Sanders et al., 2007). Outsourcing is defined as the practice of transferring activities traditionally done within a firm to third party suppliers within the country or off-shore. However, there are some different ways to outsource even if the literature does not always discern them: outsourcing, offshore outsourcing, off-shoring and subcontracting.

We speak of *offshore outsourcing* when the vendor is located in a country different from that of the buyer; the work is typically done at a much cheaper cost. Outside of costs, offshore outsourcing may be used to complete tasks that the company may not be equipped to handle in-house.

When a company is fully relocated to a country other than his home country, we speak of *off-shoring*. For example, when a car manufacturer in the U.S. opens a factory in Thailand to make certain parts they are offshoring, as everything is still happening within the same company.

*Subcontracting* instead, refers to transfer part of the work to another company that has special skills or resources that allow it to perform tasks clearly specified; so, a subcontractor works for the buyer in specific limits, while a seller cooperates with a buyer.



Furthermore, over the years many organizations have more and more relied on an outside vendor to maximize operational efficiency by focusing on their *core competences*. First introduced by Prahalad and Hamel (1990), the term refers to unique abilities that a company acquires from its founders or develops, and that cannot be easily imitated. Core competences give to a company one or more competitive advantages in creating and delivering value to its customers in its chosen field. These authors argue that this is the reason why companies should focus only on these competences and outsource all the other activities considered noncore.

## **2.1 The evolution of outsourcing concept**

In 1776 Adam Smith argued that a company operates more efficiently if production tasks are distributed among individuals, who specialize in manufacturing certain parts of the production process. During the years many other researchers elaborated theories that are still applied to approach the phenomenon that nowadays we know as outsourcing, in order to understand it deeper (Vaxevanou et al., 2014). The two most influent perspectives are:

- Transaction Costs Economics
- Resource-based View

### *2.1.1 Transaction Costs Economics (TCE)*

The first to discuss about transaction costs was Coase in 1937, who suggested that transactions should be organized within a firm when the cost of doing an activity is lower than the cost of using the market. In 1975, Williamson followed Coase's theory pointing out that if using the markets had lower transaction costs than performing an activity internally, the latter should be bought in the market. Stating this, Williamson gave the basis for the doctrine regarding outsourcing.

The TCE specifies the conditions under which an organization should manage an economic exchange internally within its boundaries, and the suitable conditions for managing it externally, referring to outsource the activity. The theory argues that firms should consider the level of transaction-specific investment in the economic exchange as the main driver in

the “make-or-buy” decision (McIvor, 2009). According to Williamson, transactions are characterized by asset specificity, uncertainty and infrequency; the former regards the level of customization associated with the transaction. In this view, when asset specificity and uncertainty are low and transactions are quite frequent, transactions will be governed by markets; on the other side, high levels of asset specificity, uncertainty and infrequency lead to hierarchical governance.

This view, thus, supports the cost factors of outsourcing strategies in the organization; the services or production will be outsourced if the strategy brings cost benefits for the firm (Iqbal et al., 2013).

The TCE has traditionally been the most widely-used outsourcing theory. It provides the best decision-making tools in order to assist organizations in deciding which of their operations should be outsourced. However, the transaction costs theory has lost some relevance because it takes into consideration costs as the only decision-making criterion, so by itself, it is no longer able to fully explain the evolution of outsourcing.

### *2.1.2 Resource-based View (RBV)*

The main assumption of the resource-based view is that resources and capabilities can differ significantly among organizations and when they are mixed and used in an appropriate way, they may create a competitive advantage for the enterprise. The RBV is important to study outsourcing as superior performance achieved in organizational activities relative to competitors, would explain why such activities are internalized within the firm (McIvor, 2009). This theory applies to identify the operations that must be outsourced and the vendor with the most appropriate resources. So, the organization will retain in-house the operations for which it has a higher capability, with the result of efficient production, while it will outsource the operations in which they have less capabilities (Espino-Rodriguez et al., 2006). A resource with the potential to create competitive advantage must meet a number of criteria such as value, rarity, imitability and organization.

Furthermore, a concern of RBV is how a firm’s capabilities develop and affect its competitive position and performance; Langlois and Robertson (1995) have pointed out

that firm boundaries can be determined by comparing internal capabilities with competitors' ones. The outsourcing decision, thus, is influenced by the ability of an organization to develop a capability and perform it better than the competitor.

Therefore, the resource-based theory may be seen as a theoretical framework that helps in the decision-making about which activities to outsource and which one to perform in-house. Following this idea, the core competences approach is one of the most powerful tools to explain why companies turn to outsourcing: according to Prahalad and Hamel (1990), a firm should invest in those activities constituting core competences and outsource the rest.

The RBV enriches the study of the outsourcing strategy taking into consideration another fundamental aspect of the process.

Analyzing both the theories, it has emerged that the two approaches may be seen as complementary as they can explain two different aspects of outsourcing and by integrating them, the two perspectives give a more shaped understanding of the phenomenon.

### *2.1.3 The outsourcing phases*

Hätönen and Eriksson (2009) describes outsourcing as a phenomenon that is far from new and looking back to the developments that occurred in this strategy they identified three broad, yet distinct phases: the era of the Big Bang, the era of the Bandwagon and the era of Barrierless Organizations.

The first wave of outsourcing can be referred to as *the Big Bang era* that started in the 1980s when the term was officially introduced. During this phase, companies were outsourcing non-core business processes just to cut operational costs; it was a way to maximize profits and it occurred domestically where relationships were relying on contracts.

It was in the early 1990s when outsourcing started to gain popularity and prompted more and more companies to adopt this strategy: this is the beginning of *the Bandwagon era*. During this period, the article "The core competences of the corporation" by Prahalad and Hamel (1990) introduced a new management approach leading the companies to outsource functions that were not in the area of their expertise. Cost efficiency was not the

only reason to outsource anymore, but companies started to seek external skills, competences and knowledge to provide value to more complex and strategically important organizational processes: a strategic outsourcing was emerging and firms started to build closer relationships with their vendors.

By the turn of the millennium, the popularity of outsourcing had become a norm rather than an exception: global access to vendors, falling interaction costs and improved information technologies and communication links allowed more and more companies to develop their business through outsourcing. This is the beginning of *the Barrierless Organizations era* which has seen the emergence of “transformational outsourcing” aiming to change the paradigm, targeting a new adaptive enterprise. In fact, it has become a tool for transforming firms towards flexible organizational forms, in which tightly integrated hierarchy has been replaced by loosely coupled networks of organizational actors. Cooperation, collaboration and co-development have become key issues in managing outsourcing relations and nowadays increasingly critical and knowledge intensive business components are outsourced. The new competitive advantage for firms lays on creating a flexible organization, in which a company focuses on selected key value creating competences and let globally dispersed outside experts provide the rest of the value.

## **2.2 Approaches to location decisions**

Today, economic cross-border transfers do not merely include final goods and services, but increasingly encompass the exchange of knowledge, people and various intermediate activities in the value chain. These exchanges are outcomes of disaggregation, relocation and reintegration of activities and business processes across borders (Jensen et al., 2011). In recent years, several contributions have highlighted new opportunities for firms to move business activities offshore, finding that firms were likely to move business processes across borders on a far greater scale than in the past, especially to low-cost destinations (Gereffi, 2006).

Kogut (2002) pointed out the importance of location stating that “the globalization of markets and rapid changes in economic and political systems have forced a re-thinking of the meaning of location, of competitive advantage and of transmission of knowledge among countries” (Kogut, 2002).

Nowadays, the offshoring debate is becoming more and more complex and so the location of manufacturing. With the third industrial revolution, the manufacturing activities aim to create new knowledge that cannot be copied by other companies and to exploit it in order to gain a competitive advantage in the market. So, the activities along the global value chain, such as R&D, marketing, innovation, design, branding cannot be performed without being related to each other and so to manufacturing, especially in this new environment of rapid change, complexity and uncertainty.

Defining which business activities have to be outsourced to which destinations is related to the fit between the nature of the activity and the advantages offered by the particular local context (Jensen et al., 2011). Therefore, outsourcing is the result of a complex set of interactions among several determinants: firm characteristics, the nature of the specific business, local context-specific factors, capabilities, costs, technology and supply market conditions.

In the next paragraph I am going to analyze which locations are more attractive for firms to outsource the manufacturing, but also the reasons and the risks that this strategy implies to organizations.

### *2.2.1 Attractiveness of outsourcing countries*

In order to understand which are the factors that influence the manufacturing location decisions, it is useful to distinguish between two types of determinants: *environmental* and *organizational*.

Environmental factors are exogenous to the organization and the firm needs to adapt to these contingencies. They may further be divided into location-specific, industry specific and market-specific. On the other hand, organizational factors are organization-specific and subject to both strategic and technological considerations, meaning that management decisions can influence the organizational factors and their effects.

Many researchers such as Howells (1990) and Helpman (2006) have pointed out that the latter are more important than the environmental factors in the manufacturing decision-making process.

During the years, many researches have developed models in order to explain the outsourcing location decisions such as Dunning and Narula (1996), who have introduced their *Investment Development Path* (IDP) model outlining five stages of a country's economic development from the first stage, where the economy is based on natural resources, to stages four and five, where country's economy is developed into a knowledge-based economy with increasing knowledge and service intensity. Regarding the outsourcing phenomenon, firms will mainly look for destination countries that are in later stages of economic development when they outsource advanced, high-end activities, and for countries in earlier stages when they outsource relatively simple and standardized activities.

In more recent years, Jensen et al., (2011) highlighted that the key point is a range of factors within the host country and their importance can influence the location decision, such as cost levels, human capital, business environment and the interaction between onshore and offshore locations. Jensen et al. took into consideration these location attributes and based their study on four destinations where to outsource: Western Europe, Central and Eastern Europe and Asian countries. They highlighted some differences between these locations, but also provided some attributes characterizing them (figure 1). They used then, these information to make some hypothesis on the abilities of different locations to attract outsourced business activities.

Figure 1: Location attributes of offshore destinations

Location attributes	Western Europe (baseline)	Central and Eastern Europe (CEE)	North America	Asia (emerging markets)
1. Cost levels				
1.1 Wages	High	Low/medium	High	Low
1.2 Infrastructure costs	High	Medium	High	Medium/high
1.3 Tax and regulatory costs	High	Medium	High	Medium
2. Human capital				
2.1 Education	2.1 Good	2.1 Medium	2.1 Good	2.1 Medium
2.2 Availability	2.2 Medium/low	2.2 Medium/low	2.2 Medium/low	2.2 High
3. Business environment				
3.1 Infrastructures	3.1 Good	3.1 Medium	3.1 Good	3.1 Medium/low
3.2 Regulation	3.2 Good	3.2 Medium	3.2 Good	3.2 Poor
3.3 Industrial context	3.3 Good	3.3 Medium	3.2 Good	3.3 Medium
3.4 Country risk	3.4 Low	3.4 Low	3.3 Low	3.4 Medium/high
4. Interaction distance				
4.1 Geographic	4.1 Low	4.1 Low	4.1 High	4.1 High
4.2 Language	4.2 Medium	4.2 High	4.2 Low	4.2 High
4.3 Cultural	4.3 Medium	4.3 High	4.3 Low	4.3 High

Source: *The economic geography of outsourcing*, Jensen P. and Pedersen T., 2011

The hypothesis of the study is that the degree of fit between the attributes of specific business activities and the attributes of various locations will determine the business activity that is offshored to a specific location; thus, they were able to explain why some business activities are offshored to a specific country rather than another location.

About the manufacturing process, Jensen et al., highlighted that some authors such as Buckley and Pearce (1979) showed that labour-intensive manufacturing processes were outsourced to low-cost production zone in developing countries. More recent models pointed out that there are other important strategic reasons, other than cost advantages, to outsource the manufacturing, such as an ease access to human resources, new markets and skilled workers and these attributes are very distinctive in Asian countries and Central-Eastern Europe. Also, the business environment is very attractive in Asia rather than Europe or America, since regulations are at a lower level and firms can exploit them to easily run their business in these countries. As Mann (2012) pointed out, the role of government in trade facilitation reform is gaining more and more importance, since they try to make their regions more attractive locations for manufacturing. Furthermore, according to Mudambi (2008) “under the current location pattern, high value-added activities are largely

performed in advanced market economies, with low value-added activities performed in emerging market economies”;

So, in this view, considering Jensen’s analysis and the fact that cost advantages are often a prominent reason when offshoring manufacturing and they still remain the first driver, we can conclude that companies are still keen on to outsource the manufacturing to low-cost destinations; while, a higher value-added activity such as R&D, is outsourced to destinations with a substantial knowledge base like North America according with the table above.

### **2.3 Reasons to outsource the manufacturing process**

There are many reasons why firms decide to outsource the manufacturing process. Cost reduction has been the predominant motive which implies choosing a vendor that performs the outsourced function more efficiently than buyer could. To achieve reduced cost while maintaining standards requires that the supplier has access to superior cost drivers such as economies of scale, learning and low-cost locations.

However, as firms learnt about other potential resources in the foreign location over years, their reasons change. The focus on diminishing wage or other operational costs remains significant, but reasons related to acquisition of knowledge become more and more important (Maskell et al., 2007). Outsourcing may thus be seen as a learning process where firms discover new possibilities abroad and new organizational ways of using them. In the same way, the organization can focus on their core competences, improving their competitive advantage, paying more attention to the market and being more reactive to its changes.

According to Dunning (1998), the most influential drivers in the decision to outsource the manufacturing are:

- *Resource seeking advantage*: which concerns not only the availability of raw materials and infrastructure, but also the importance of vendor as a resource.



- *Marketing seeking advantage*: which concerns the availability and cost of local talent and suppliers, access to domestic markets and government economic policies.
- *Efficiency seeking advantage*: which combines both production cost-related factors, specialized industry clusters and government removal of trade barriers.
- *Strategic asset seeking advantage*: which considers knowledge-related assets and synergies to gain tacit knowledge, understanding of market and consumer patterns and tangible and intangible synergies in general.

More recently, research on manufacturing location showed that firms are moving from resource seeking advantage toward strategic asset seeking one, or more complementarity activities such as knowledge creation and value creation (Gereffi & Lee, 2012); on the other hand, Mudambi (2008) pointed out that firms aim to both control costs and leverage capabilities.

Other researchers, Bulajic et al. (2012), identified many reasons to outsource that can be divided into three groups:

- *Economy-driven* reasons focus on cost savings related to production expenses, low wages, which are many times less than the one in the Western countries, as well as increasing profit.
- *Resource-driven* reasons focus on access to know-how, technology, expertise and raw materials or other resources.
- *Strategy-driven* reasons focus on the access to new emerging markets such as Brazil, India, Kenya or China where the cost of production is very low as well as wages.

Furthermore, outsourcing is also motivated by seek global talents around the world such as brilliant students form universities in the Far East, in order to maintain or gain a competitive advantage, since it constitutes a global workforce made by different cultures and nationalities able to create a pool of knowledge difficult to reply by competitors.

According to Jennings (2002), outsourcing gives to organizations the opportunity to avoid the constraints of their own productive capacity in meeting changes in the volumes of sales and the flexibility to change the product range in response to the market conditions. Within the apparel industry, for instance, Richardson (1996) describes how rapid information

exchange, rather than ownership of the various steps of production, enables companies to respond to the industry's short life cycles and abrupt changes in fashion.

Some authors such as Quinn et al. (1990), emphasize the benefits of outsourcing in providing increased focus upon a set of core activities enabling the development of a more focused organization capable of being more reactive to market changes. The complementary use of outside resources can also provide opportunities to leverage the organization's core resources.

The use of outsourcing may also facilitate the development of economies of scope through product diversification; this can be achieved by reducing functional complexity and with a greater focus on core activities which enables the development of product/market complexity.

## **2.4 Risks of outsourcing**

Obviously, as any decision, outsourcing has its benefits but also its risks and limitations to take into consideration.

Two of the most important risks are connected to losing skills key to competing for the future; and the risk of making the outsourcing move at the least suitable time in an industry's evolution (Leavy, 2004).

Concerning the former, firms are attracted to outsource manufacturing as a mean to relieve intensifying competitive advantage, however if they fail to consider the long-term implications, they may waste their future opportunities for short-term advantage. Hasty outsourcing, thus, could be translated into the loss or unintended transfer of critical learning opportunities.

The latter, instead, refers to the need to know when in an industry evolution and where along its value chain, the outsourcing is favourable for an organization. In order to catch the right moment in the market evolution to outsource, managers should understand that competitiveness is far more about doing what customers value than what they think they are good at; knowing the difference is very important in taking an outsource decision. A firm should always focus on what creates value for customers and when the situation changes and further improvements have a negligible impact on the customer, that is the moment to outsource that activity.

Furthermore, we need to consider also other risks such as the fact that the process may be not as cost-efficient and problem-free as expected, so firms can incur into problems with higher costs or the service could be not as good as it was supposed to be; in this case, also the flexibility of adding new features or enhancing or changing service is reduced.

According to Belcourt (2006), when a firm outsource, it has to consider that there could be the risk that the vendor may enter the market and become a competitor by creating a leakage of critical knowledge concerning processes and customers; in order to avoid this, the firm should erect some strategic blocks that can limit the replication of certain competitive advantages or spread the outsourcing among many suppliers. Related to this issue, there may be other unintended consequences to outsource the firm's knowledge and skills, in fact the supplier may even sell the acquired know-how and company secrets to a competitor.

Organizations may find also internal limitations concerning employees, in fact their skills, instead of being a resource, may limit the firm's ability to learn and exploit changes. Besides, outsourcing may have an impact on employee morale and performance due to the disruption of their secure environment. In the outsourcing process, employees may be transferred internally or outplaced, and this may create a feeling of resentful among them. Outsourcing, thus, can bring to the disintegration of an organization's culture: instead of empowering and valuing employees, it may de-skill them, facing a backlash. In this case, the outsourcing, may have served as a developmental site for managers, but useless if the organization cannot make some arrangements to settle the new situation.

### **3. THE RESHORING PHENOMENON**

In recent years, the topic of manufacturing reshoring has gained more and more importance among researchers and organizations. Even though a few researchers have documented reshoring activities since 1980s, the growing trend since 2010 gained more attention to the activity.

In times of global crisis, Western countries have seen reshoring as a partial solution of rising unemployment and higher wages to low-cost countries and as a mean to support re-industrialization leading some governments to encourage and subsidize repatriations. The literature has identified a wide range of motivations for re-shoring and also different views have been proposed interpreting the phenomenon either as an adjustment to changed location advantages, or as a correction of an erroneous location choice.

In the next paragraphs I am going to analyze deeper this phenomenon focusing on the reasons why firms choose to re-shore the manufacturing process to developed countries where there are higher-skilled workforce, but also higher costs comparing to developing countries; since costs is the first driver of outsourcing, it is interesting to dig into which factors may be even more important than this; on the other hand, of course, there are also some limits to take into consideration.

### **3.1 Definition of reshoring**

Re-shoring or back-shoring is defined in broad terms as the company's decision to bring the production back to its home country; it is fundamentally concerned with *where* manufacturing activities are performed.

The first definition of re-shoring was proposed by Holz (2009): "the geographic relocation of a functional, value creating operation from a location abroad back to the domestic country of the company".

In the same year, Kinkel and Maloca gave a quite different definition, considering the repatriation of entire production activities, not only part of them and, thus, defining reshoring as the: "re-concentration of parts of production from own foreign locations as well as from foreign suppliers to the domestic production site of the company".

Gray et al., (2013) have identified re-shoring as a location decision comparing insourcing with outsourcing. Accordingly, they pointed out four possible types of re-shoring:

1. *In-house reshoring* in which a firm fulfils demand in its local market by relocating manufacturing activities being performed in wholly owned offshore facilities back to wholly owned home country-based facilities;

2. *Reshoring for outsourcing* in which a firm fulfils demand in its local market by relocating manufacturing activities being performed in wholly owned offshore facilities back to wholly owned home country-based suppliers;
3. *Reshoring for insourcing* in which a firm fulfils demand in its local market by relocating manufacturing activities being performed by offshore suppliers back to wholly owned home country-based facilities;
4. *Outsourced reshoring* in which a firm fulfils demand in its local market by relocating manufacturing activities being performed by offshore suppliers back to home country-based suppliers (Table 2).

Figure 2: Reshoring options

		<i>To: Onshore</i>	
		In-House	Outsourced
<i>From: Offshore</i>	In-House	In-House Reshoring	Reshoring for Outsourcing
	Outsourced	Reshoring for Insourcing	Outsourced Reshoring

Source: Gray et al., *The reshoring phenomenon: what supply chain academics ought to know and should do*, *Journal of supply chain management*, 2013

### 3.2 Reasons behind reshoring

In the last decade both practitioners and scholars have identified motivations for reshoring, even if studies lack a clear theory-grounded interpretation of the motivations. In fact, a strategic relocation of industrial manufacturing from low-cost to high-cost environments has not been recognized immediately, that is why reshoring is still an emerging and under-researched phenomenon. Nevertheless, the literature has focused on what drives firms to make a reshoring decision despite the locational advantage of having low labour costs at the offshoring location.

Wiessmann et al. (2016) have identified these drivers splitting them into four broad categories.

### *3.2.1 Global competitive dynamics*

These are broad set of variables that apply to any set of locations and are compared during manufacturing location decisions. They are not mutually exclusive, but instead strongly related, for this reason these factors can be very unpredictable and submitted to continuous change. When a firm has to take a location decision, it cannot rely exclusively on these parameters, even if it has definitely to take them into consideration, being aware that local differences are dynamic and the factors influencing a region's attractiveness for business constantly change.

In this category, the drivers of reshoring that have been identified are the following:

- Changes in the global economy;
- Political risks can unexpectedly interfere with trade flows and so changing the previous dynamics and balances;
- Instability in exchange rates which is of major importance to global trade flows and unfavourable developments can quickly outweigh factors that were previously perceived to benefit a certain location;
- Increased competition on resource assets pushes production sites away from low-cost manufacturing. When the conditions for manufacturing in a low-cost country change due to the increasing presence of firms competing for the same limited resources such as human labour, the costs of them increase and companies prefer to take back the outsourced activity.

### *3.2.2 Host country*

In this category, the factors are specific of the host country and they appear to be a positive influence in the reshoring decision.

- Diminishing growth opportunities have led companies to try to centralize their operations in order to reduce transaction costs;
- Inadequate quality is a very important decisional factor on reshoring as in the long-term it can become a waste of time and resources for firms;
- Theft of intellectual property and patent enforcement is the result of weak patent enforcement in the developing countries; in fact, non-compliance with agreements

is more troublesome for companies in countries with poor public regulatory systems;

- High employee turnover continues to be a problem in many offshore locations as it is hard to get and keep an educated workforce for skilled labour.
- Risk of public relation disaster due to supplier malfeasance increases as the supply chain grows global.

### *3.2.3 Home country*

These factors are underlined once a firm moves manufacturing operations and realizes that some market aspects are more appealing in the home country. Even if the specifics of the home country should be taken into consideration before reshoring, it is also true that market demand conditions change over time and some of them relevant to manufacturing may be altered.

The drivers encompassed in this category are the following:

- Political incentives are a common driver as they improve domestic production;
- Access to qualified personnel may be a driver for reshoring since firms can get access to skilled workers and know-how; but it is a very volatile factor as it may be either a driver or a barrier in both host and home country;
- Increased degree of automation reduces the importance of labour cost and makes the production process in a high-cost environment more affordable. In fact, as in the last decade, with the fourth industrial revolution, automation became more available among firms, the productivity in developed markets improved;
- Increased awareness of environmental impact and focus on sustainability are similar factors that show there is a better understanding of how production affects the environment and the importance that sustainability has gained in the last years;
- Last but not least, strengthen brand through made in “XX” has become a differentiating factor that has gained more and more importance in many markets during the years, so reshoring the production may be a strategic move to attract new customers through the made in awareness.

### *3.2.4 Supply chain*

At the supply chain level, outsourcing may become difficult due to longer distances in the exchange of information and goods; in fact, the communication and the control of processes become more difficult and also synchronizing business functions between emerging countries where the production process takes place and developed countries may be troublesome.

In this category, many reshoring drivers have been found and also researchers focused on these factors more than others in other categories:

- Innovation, research and development suffer due to the distance to manufacturing. In fact, researchers pointed out that it is hard to innovate and be innovative if the manufacturing is located far away from the rest of the process;
- High coordination costs occur when working with global supply chains, offsetting potential cost savings from cheap labour. When a function is located in another country, the coordination between it and all the other activities involved in the process is hard to achieve and this is why it implies higher efforts and costs in order to make them work together properly;
- Risk of disruption increases with longer distances;
- Difficulties to match production (supply) and consumption (demand) volumes may occur in many different ways; for instance, the need to place orders that are too big compared with the forecast has an impact on financial metrics and increases the risk of obsolete inventory. Outsourcing part of the production process may make the company not flexible enough to face these changes as fast as possible. On the other hand, reshoring will help the company to be more reactive to the demand changing avoiding the loss of money and resources that would occur when an activity is located in another country;
- Inability to provide services related to the product is a result of blurring boundaries between products and services. Recently, value-adding services are becoming more and more part of the product as they are a strategy to gain a competitive advantage in the market. Since services are hard to produce in an offshore location, many firms decide to re-shore just the final production;



- Increased demands on customization goes together with services; even if it regards the physical part of the product, reshoring makes easier for a company to satisfy customers being more reactive to these changes.

### **3.3 Limits of reshoring**

Several companies, once re-shored the manufacturing process, encountered problems regarding complexity and realizations of unexpected risks. According to Ellram et al. (2013), firms considering reshoring, need to evaluate the risky factors in order to take the right decision. Reshoring limits have not been studied in detail by literature (Valkonen, 2016) and it is why many risks are related to all manufacturing relocation decisions. Furthermore, it is important to be aware that reshoring disadvantages are expected to have less impact than offshoring since companies can have more control over the production that takes place in the home country.

Ellram et al. (2013) have pointed out some important risks to take into consideration before making a reshoring decision; first of all, when a company decides to reshoring the production, there is the risk that it is not able to compete in manufacturing price: in fact, the firm must consider which will be the impact on the manufacturing cost in the long-term and if it will be able to sustain those costs being, at the same time, still competitive on the market.

A firm should also consider the risk of not being able to provide new knowledge nor innovation anymore due to the fact that it lacks of qualified staff or it does not have the right competences; in fact the firm may not be able to exploit the international know-how once it has re-shored the manufacturing as it was used to do in the offshored country.

Wiessmann at al. (2016) identified the risk of losing access to market and foreign distribution channels as well as the access to raw-materials and components that are only available in the host country or it may even occur into stricter environmental legislation that can make it harder to produce in the home country.

Furthermore, once a company re-shores the manufacturing, it has to consider that it might be too late to go back, as with time away the initial cost for returning home increases; on

the other hand, also an immature reshoring process can lead to over-hasty decisions, continuing a spiral of adverse effects. As mentioned above, also Wiessmann et al. (2016) pointed out that the lack of capacity, resources and internal competencies may make it hard to re-establish the production in the home country; as well as the lack of proper decision support/data, which is a lesson learnt from unsuccessful offshoring and makes firms reluctant to move back home. Moreover, the lack of information and communication about reshoring within the business makes firms reluctant to adopt this strategy, especially if they have encountered difficulties in this area in earlier decision-making processes.

## ***Chapter 2: RESHORING IN THE APPAREL INDUSTRY***

### **1. AN ERA OF CHANGES**

The apparel industry is facing a period of changes in which faster fashion and in-season flexibility are important elements in order to be successful in the challenging market environment, which is becoming more and more volatile. In fact, the industry has seen a shift to bottom-up trend setting, where trends are more likely to pop up from individuals who have become the trendsetters and the tastemakers. Furthermore, sales volatility in the fashion market is increased by the continuous shift to online platforms and the emergence of new business models. Thus, many mass-market apparel brands are struggling to adapt to the new reality and continue to produce high volumes of stocks in bulk production based on planned strategies.

In this new scenario, in order to respond quickly to the market needs, companies should move to a demand-led model in order to pull levers in all phases of the fashion cycle, bringing production back closer to consumers; in this way companies can offer the opportunity to eliminate chunks of lead time.

Over the past decades, apparel companies in US and Europe have offshored the bulk production to China and other low-cost countries in order to take advantage of the low labor cost. However, the offshoring model does not fit into the new need of speed that the apparel market requires. Indeed, for instance, shipping a delivery from Asia by sea to Western countries takes usually 30 days, which is a way too long lead time that do not provide any flexibility nor differentiation.

Furthermore, the offshoring sourcing strategy is under pressure also for other reasons, such as Asia's rising demand for apparel. Whereas in the past, the strongest demand for clothing came from the West's developed markets, nowadays demand growth mostly

comes from other parts of the world, particularly by the Far East and the Southern Hemisphere. Consumers in Asia are buying more clothes than ever before: according to J. Andersson et al. (2018), apparel sales in Asia are projected to grow by 6 percent each year, accounting for about 40 percent of global sales by 2025. This increment of local demand is creating competition for Asian apparel manufacturing capacity and changing the export balance. Though there are not yet substantial capacity issues, many Chinese manufacturers are switching their focus and producing for the local market since the demand is so high.

### **1.1 Reshoring drivers in the apparel industry**

Production in the Far East is no longer as cost efficient as it used to be and wages of factory workers across Asia have risen. For instance, labor costs in China in 2005 were one-tenth of those in the US; while today, they are about one-third. In some reshoring markets, the gap to offshore labor costs has even disappeared, while a lack of capability and capacity continues to prevent any quick shift in production process.

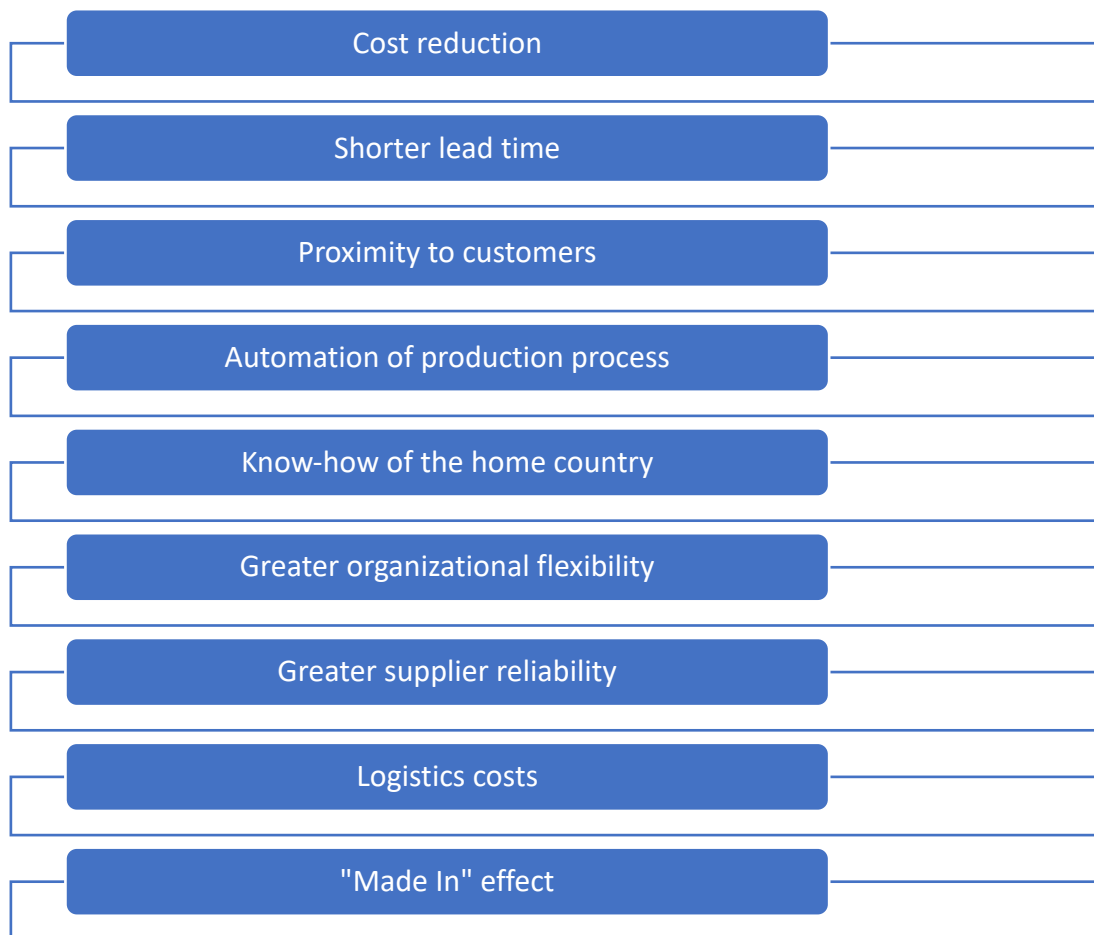
Thus, decisions about the future apparel production placement should be based on two main criteria: the cost reduction from reshoring and the commercial value of reducing lead times. In fact, shorter lead times will have high commercial value for fashion items. As a company gets items into stores faster, it will be able to test and scale more styles. Besides, it can also reduce inventory levels and boost sell-through rates and sales volumes.

Furthermore, even from a landed cost price perspective, reshoring or nearshoring might be economically convenient in certain cases, mostly due to savings in freight and duties. Obviously, it is more convenient for an European or American company to ship goods from a closer country rather than China in terms of costs and also in terms of timing: in fact by sea the delivery takes almost 30 days. Even from an environmental point of view there are advantages, as shipping by air or by sea from China is less eco-friendly.

Obviously, there are also more general drivers that make companies want to reshore the manufacturing process. According to Eurofound research report (2019), among the most important reasons there are the proximity to customers which is very important in the apparel industry since trends are changing so fast; a higher level of service and reliability

of the supplier; automation of the production process, referring to investments in robotics that can reduce labor usage and in return decrease cost differences between the offshore and the reshoring countries. It enables also the implementation of strategies based on product and process innovations. Furthermore, reshoring from China means also looking for a better know-how of the products and the production processes and a greater organizational flexibility; last, but not least, some companies also reshore to foster the perception of the “Made in” effect.

*Figure 3: Reshoring reasons in the apparel industry*



*Source: Eurofound research report (2019)*

## 1.2 Reshoring challenges

Obviously, there are not only advantages referred to reshoring, but it is going to generate also a number of trade-offs and challenges in terms of productivity, operating model industry structure, sustainability, and supply.

The apparel manufacturing industry in reshoring countries in Europe, Americas or Turkey, has a distinctly different profile from the Asian manufacturing factories. The current import volume from the five biggest nearshoring markets to the US, for example, does not even account for half of the US imports from China. The garment manufacturing landscape in Central and Eastern Europe is fragmented and follows the outward processing trade model. Quality and labor productivity in some reshoring countries are more volatile. Additionally, these countries come with their own environmental and social compliance risks, although much of the industry players' current focus is on the large Asian sourcing markets.

One of the biggest challenges nowadays is the sourcing of raw materials, fabrics, and ingredients. In fact, only a co-located value chain can offer the full speed and flexibility in the supply chain; without it, longer lead times are just shifted further up in the value chain. However, the current bulk of production and consumption with the main fiber types, for example, is regionally focused on Asia. Meaning that China plays still a key role as a supplier for yarns and fabrics, also for neighboring low-cost sourcing countries. On the other hand, in nearshore countries for US and European apparel markets, the existing capacity is limited, and local yarn and fabric supply varies greatly; furthermore, the well-developed European fabric and yarn industry is focused on premium and luxury customers. Building new yarn-spinning and fabric mills takes time and requires high capital expenditure: to attract manufacturers in order to invest in building the capacity, requires apparel brands and retailers to act as true partners and commit to order volumes. The discussion of regional supply chains is gaining additional traction in light of innovations in sustainability and closed-loop recycling.

Overall, according to J. Andersson et al. (2018), it is likely that fabric production will move toward reshoring to support regional supply chains by 2025. Regarding the possibility of own investment by apparel brands and retailers in fabric or garment factories, the research

shows that 49 percent of people have a positive leaning and 48 percent are skeptical. In the meanwhile, apparel companies will have to focus on increasing the speed and flexibility in the garment production and finishing stage by expanding fabric libraries and integrating them into their virtual design software for at least part of their assortment, and by importing greige fabric and generic yarns from Asia.

Furthermore, to make the right sourcing decisions today, it is crucial to focus on full profitability of the product rather than just on landed cost price. The old sourcing model focused on unit cost price only is no longer efficient; on the other hand, the fast-cycle approach or dual sourcing models with quick supply are only suitable for selected parts of the assortment, so a mixed sourcing approach is needed. Successful sourcing departments will pursue a more comprehensive perspective on product profitability if they are going to support the demand-led model which successful mass-market apparel brands and retailers are moving toward. In fact, apparel companies are starting to build the capabilities and implement the tools needed to support this intelligent-sourcing approach.

Reshoring will make even more economic sense as technology develops because automation will increase labor productivity, and this will balance higher labor cost levels of nearshore and onshore production. From the perspective of mass-market apparel brands and retailer buyers, making decisions regarding reshoring of certain products will not be focused just on the commercial importance of a short lead and the cost improvements discussed previously; they will need to consider the promise of automation as a factor in reshoring feasibility, as we are going to discuss in the next paragraphs. This also means that bringing production closer to consumers through reshoring will require local governments and garment industries to build the skills and capabilities needed for advanced manufacturing among the workforce in these countries.

Mass-market apparel brands and retailers, however, should not wait for further advances to occur in automation technology before they get started; instead they should take advantage of the situation and already start exploring the prospect of reshoring while becoming familiar with new potential sourcing regions.

### **1.3 Examples of reshoring**

Roy Lowe & Sons is a family-owned company established in 1996 in UK. The firm produced socks the home country until 2006 when it decided to offshore and outsource production activities to China, Turkey and India to reduce production costs. When, in 2013, the company launched a new brand (SockMine) for its line of technical, sport, leisure and workwear socks, it decided to leverage the “Made in the UK” label. Thus, it reshored some production activities and insourced them to its old plant in Sutton-in-Ashfield. Between 2013 and 2017, the company reshored around 10% of its entire production. Other reshoring motivations declared by the company included: delivery time, product quality, protection of innovation and co-location of R&D and production activities.

Another examples of manufacturing reshoring regards Diadora, which is an Italian company, mainly producing shoes, T-shirts and other sportive products. In 2017, the CEO Moretti Polegato announced company plans to reshore to Italy 10% of its high-end production activities over the next three years while the rest of its products will be produced in Vietnam, China and Thailand. The decision was taken to support the innovation process and to bring the production and R&D departments closer to home. In addition, the company was able to leverage the ‘Made in Italy’ label and to reduce the environmental impact of its production process.

## **2. THE PROSPECT OF AUTOMATION IN THE APPAREL INDUSTRY**

As the mass-market apparel sector is moving to a demand-focused supply model and labor costs increase, automation is going to play an important role in increasing labor efficiency, throughput, and flexibility. In fact, automation will be crucial to increase the financial profitability of on-demand reshoring models.

However, the apparel industry is handling the shift to automation slower than other sectors. For example, in automotive industry, robots are adopted seven times more than in the apparel; in the electronics industry, it is about four times more. Whereas some



garment manufacturers have started investing in automation, neither automation nor advanced manufacturing have been a priority for the buyers at mass-market apparel brands and retailers for a several grounds.

One reason is that apparel buyers have relied on relatively low labor costs in the core Asian sourcing markets and are now relying on the move to newer low-cost sourcing markets. Programs supported by apparel brands and retailers with manufacturers have instead focused on compliance and sustainability measures and on more traditional efficiency improvements following lean techniques. Another reason refers to the technical challenges generated by automation, especially in the sewing process, as fabrics have proven difficult for robots to handle. Only in the last years, solutions for full automation in sewing selected fabrics have become market-ready, while semi-automation has found some application in factories around the world. Also, fragmentation of the industry has prevented investment in automation technologies.

## **2.1 Automation technologies applied to the manufacturing process**

Before being able to fully understand the prospect of automation for apparel manufacturing and its potential impact on reshoring, companies need to have a detailed understanding of the technology landscape. While conducting a broad screening throughout the apparel production process, it has been possible to identify the five key automation technologies that show the most promising technological impact on apparel manufacturing. It emerges that automation of sewing and logistics might offer a changing step in the efficiency of existing processes; additionally, new processes are enabled by innovative technologies in gluing/bonding, knitting, and finishing.

**Sewing:** currently the most labor-intensive step in creating a garment, sewing accounts for more than half the total labor time per garment. The potential for labor reduction is highly dependent on product type and design, but it might happen that up to 90 percent of the sewing of simple garments can be automated. While there are a variety of different semi-automation solutions, SoftWear Automation is an example of a pioneer company in the study and investment of fully automated sewing process.

**Intralogistics/warehousing:** after sewing, this is the most labor-intensive part of the apparel production process and one of the most likely in terms of errors due to issues in picking. Robotics in intralogistics throughout the production process as well as warehousing can reduce labor intensity and processing time and errors, while improving worker ergonomics. Looking at technologies in the market today, they include overhead garment-on-hanger systems, which utilize the previously empty overhead space in a warehouse to store, sort, and pick display-ready garments, and self-driving warehouse vehicles that can transport items as well as load and unload washing machines and dryers.

**Gluing/bonding:** emerging gluing/bonding technology are going to allow companies to completely bypass sewing while adding functionality to performance garments. However, adhesive technology to improve water resistance are not adopted just by outdoor brands as it used to be in the past, but gluing today is also used in the high-end design segment. Combined with robotics, gluing and bonding have the potential to significantly reduce labor and increase the production speed.

**Knitting:** advances in knitting technology, such as 3-D knitting or computer-controlled, enable customization and improvements in design and fit. These make knit garments more versatile and increase the garment's commercial value and this is a motivation for apparel companies to increase the shift from woven to knit materials. Nike's Flyknit product line, for instance, uses a computerized knitting process that has reduced material waste by 80 percent. Knitting innovation also supports single-item production and new factory-in-store concepts.

**Finishing:** automated finishing (for examples digital printing, abrasives, lasers), which is fast, low cost, and requires little labor, makes it possible for an apparel company to reshore the finishing process: in fact, digital printing can reduce labor by up to 70 percent and abrasives by up to 90 percent.

## 2.2 Economic impact of automation

How much will a particular technology reduce lead time? What investment is required for that technology and how quickly can it be regained? In this paragraph I am going to try to give an answer to these questions.

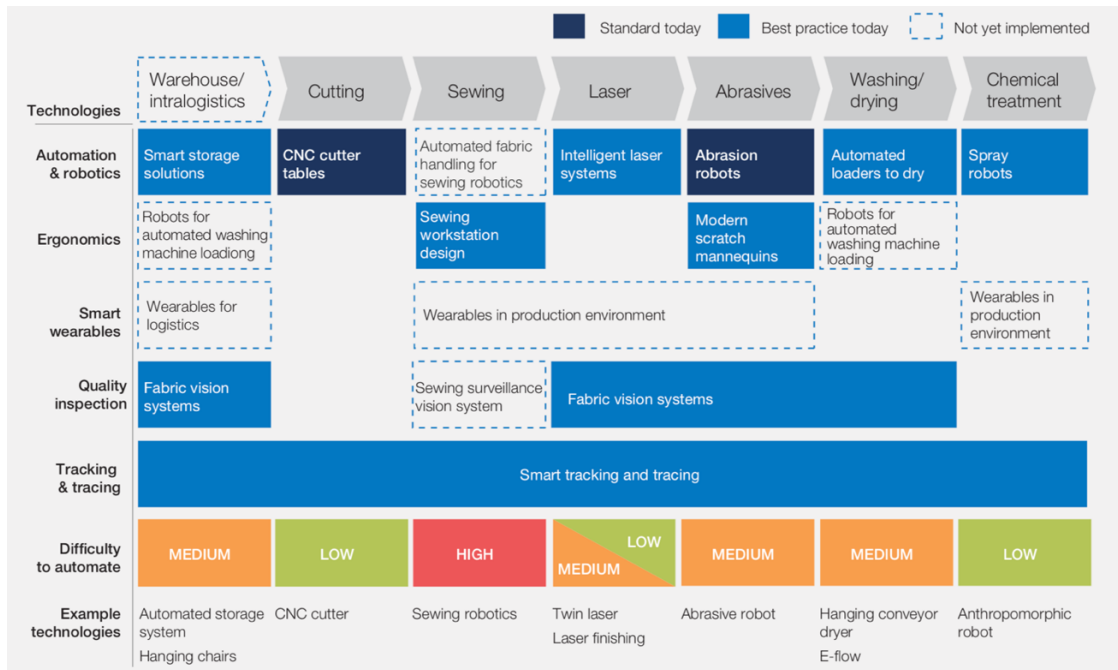
In several steps of the production processes, innovative technologies have not yet been broadly implemented. These provide an indication of the automation potential in the years to come; for instance, there might be the development of robots for automated washing machine loading, automated fabric handling for sewing robotics and support from smart wearables in the production process.

So far, the assessment of the automation technologies has been extremely difficult to exploit, especially applied to the sewing process as shown by the figure 4 below.

The table shows for each step of the process, the degree of difficulty to automate the phase, the automation already adopted and the one that has not been implemented yet; thus, there is still margin to exploit new and more advanced technologies, which means that reshoring phenomenon has still to reach its best momentum in the apparel industry. As mentioned before, sewing and warehouse/intralogistics are the ones that have more possibilities to be implemented in the future with the introduction of automation. According to the figure, sewing is the hardest to be automated so far, as it is the most labor-intensive step of the process, however there are some solutions that might be adopted in the years to come such as the introduction of automated fabric handling for sewing robotics, the establishment of wearables in production environment and sewing surveillance vision system.

Regarding the intralogistics step instead, companies should focus on the introduction of robots for automated washing machine loading and wearables for logistics.

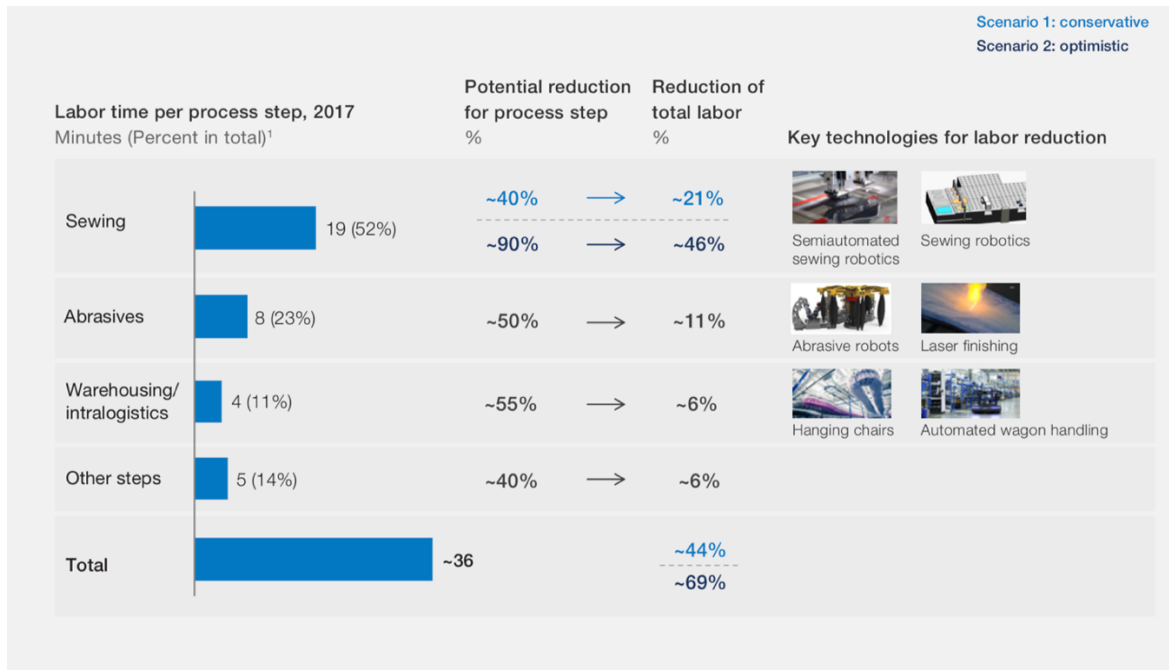
Figure 4: Automation applied to the apparel manufacturing process



Source: J. Andersson et al. (2018), *Is apparel manufacturing coming home?*

Assuming that all key technologies currently in development are implemented, about 40 to 70 percent of labor time can be reduced through automation; for instance, the labor time per pair of jeans can be cut from 36 minutes to 20 in a more conservative scenario, or even to 11 minutes in a more optimistic scenario. As sewing accounts for more than half of the labor time in the standard production process of denim trousers, sewing automation will be the biggest driver for reducing labor, accounting for about 21 to 46 percent as shown in figure 5.

Figure 5: Sewing process as the main driver of labor reduction



Source: J. Andersson et al. (2018), *Is apparel manufacturing coming home?*

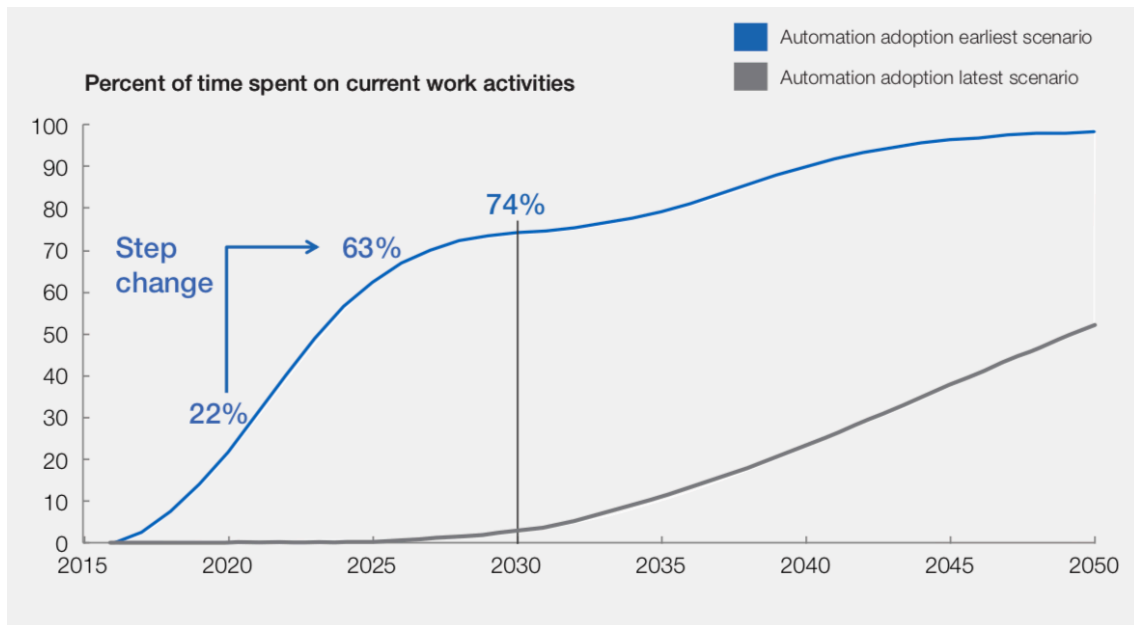
As automation technology continues to evolve, it overcomes the current barriers mentioned previously, and it becomes more affordable, the economic profitability of reshoring by suppliers with advanced manufacturing will improve over time.

According to J. Andersson et al. (2018), “within five years, semi-automated factories could enable reshoring and selected lighthouse projects of new business models, such as store factories, which could help in building customer excitement; and within five to ten years, suppliers with fully automated factories could enable full reshoring. More complex figures will be semi-automated within a decade and to such a degree that companies can scale up new, high-margin business models that include customization.”

However, beyond technical feasibility, cost savings, and the potential commercial value-generation of automation, there are other factors that will impact the rate of adoption in apparel manufacturing. Therefore, the scenario includes the time required to develop capabilities, regulatory considerations, labor supply and demand dynamics, and social acceptance among other factors. Based on this perspective, the adoption of automation in

the apparel manufacturing has the potential for a real step change development before 2025, when the adoption rate of automation is expected to reach up to 63 percent in an earliest scenario model (figure 6).

Figure 6: Pace of automation adoption in the apparel industry



Source: J. Andersson et al.(2018), *Is apparel manufacturing coming home?*

Looking at the trajectory of automation technologies and adoption, mass-market apparel brands and retailers should not at all wait for the further advancement of innovations. On the contrary, they should embark on the journey toward a demand-focused value chain now or they could risk losing touch with their consumers in the not-too-distant future.

### 2.3 Future sourcing and production strategy

Looking at the future, it is going to be crucial for mass-market apparel brands and retailers knowing where they want to go and how to get there. In their request for an on-demand supply chain, they should plan different financial scenarios that allow them to develop a quantified fact base to use in their strategy. This modeling should consist of three different elements. One element involves estimating the potential value of improved speed to market and doing so for various product lines. The value of speed-to-market will be derived from factors such as higher full-price realization, lower inventory levels, and increased

sales. The latter will be generated by responding more quickly to trends, reducing cannibalization and brand dilution through discounts and generating the ability to test more styles, avoiding early sell-out on successful styles. In the long run, this will also strengthen the overall brand position.

The value of improved time to market will vary between brands and different product lines, for instance highly seasonal and trendy items will benefit much more than will basic garments. Therefore, brands should analyze historical data and look at volatility, sell-through rates, and markdowns for different product categories in order to develop an informed picture of the impact that improved speed could have.

Once the impact of speed is estimated, the next factor should be understanding the cost implication and feasibility of reshoring for different product types. In this case, a strong cost baseline should be built for any production in different countries based on labor time (for the garment in question), labor cost and productivity (for different countries), tariffs, logistics costs, etc. When this cost baseline is established, an assessment of feasibility to manufacture various product types in different countries should also be conducted, including a perspective on current manufacturing capabilities and access to fabric; in this phase, several factors like productivity, manufacturing capabilities, and access to fabrics should be viewed as influenceable, since pioneering apparel companies will invest in improving them.

Having identified the value of time to market and cost baseline, they should now be integrated into an overall view of the economics of reshoring meaning that brands should then augment their strategy with different scenarios of automation.

What is interesting is that, once automation has overcome the current technical barriers, reshoring and automation will not make financial sense for every single apparel brand's or retailer's product going forward. In fact, decisions regarding the future production footprint of each product type should be based on two main criteria: the viability of reshoring and the commercial value of reducing lead times.

In other words, the variation of the two key factors impacting reshoring feasibility, labor intensity and automation difficulty, vary greatly between different product and design types. The differences for both are mainly driven by the same characteristics, for instance,

number of pieces, movement of parts, finishing and intricate details and type of raw materials. On the other hand, product lifecycles and the degree of fashionability are key differentiators impacting commercial importance of short lead times and agility for increased sales and higher sell-through rates.

As in a number of industries, access to talent will be a major success factor in achieving the supply chain of the future. The biggest talent gap today is very likely in digital/advanced manufacturing and managing smart sourcing decisions in more complex apparel value chain is becoming difficult; thus, being able to make employees shift from the “old” to the “new” sourcing world will be key in this context. Successful players do not hesitate in starting the process and building in-house expertise on the go. Furthermore, recruiting talents in this area will require apparel companies to develop an appealing employee value proposition; companies should also not overlook senior expertise who possess vast experience from having worked in other industries. In other words, employees with the best and most extensive understanding of the engineering behind both existing and future-based technologies are equally as important as the technologies themselves.

To sum up, the main task for companies will be to stay at the forefront of industry wide developments and decide where to invest on, while it is important to have people who are able to develop or identify winning technologies. Furthermore, the complexity of a mixed-sourcing approach setup for speed is much higher than an Asia-focused approach, which is optimized for cost and large batch sizes. At the same time, collaboration with suppliers is becoming more important as they work and grow together in order to create value to the final customer, so it is important to have a strong relationship based on communication and coordination as tools to successfully manage the new sourcing model complexity. Companies may already have the right staff in place to handle this; if not, a step-up in analytical and managerial capabilities as well as relationship management is needed.

In addition, to build their own digital manufacturing knowledge and intelligent sourcing capabilities, it is going to be difficult to find people who are familiar enough with the current situation and who know how to scale up sourcing operations and expand capabilities in newer, less developed regions. Thus, an effort to develop this kind of talent



should be one of the main focuses of any company and collaboration with governments and local industry associations will be the key to enable the development of new manufacturing clusters.

Obviously, building skills and changing mindsets will be critical for a successful transformation because the technological opportunities from automation and digitalization and the need for speed on re-thinking the entire apparel value chain requires a very different, much more consumer-focused and agile approach. For the last several decades, the apparel sourcing industry operated with the mindset of squeezing suppliers and constantly searching for the next FOB (free-on-board) reduction opportunity and cheaper country. As players will not be able to handle it alone in the future, it will be important to shift mindsets when it comes to build an ecosystem of partnerships as explained in the next section.

### *2.3.1 Partnerships as a key factor*

Partnerships are going to be a key factor in building a sustainable competitive advantage in the context of uncertainty regarding winning technologies and a high-paced speed of innovation. Apparel brands and retailers will need to forge relationships with several different types of entities.

First, they are going to need partners with global mega-suppliers in order to build manufacturing capacity and capabilities in new geographic areas. As automation will further speed supplier consolidation up by 2025, now it is time to build a network of partnerships. Companies should choose strategic manufacturing partnerships based in part on how advanced the manufacturers are with regard to automation and also on their experience in setting up production in frontier markets while ensuring quality, productivity, and sustainability. In other words, a fundamental shift away from the historically transactional and cost-focused supplier relationship is needed.

To be able to be a pioneer in the industry, brands will also need to collaborate with technology companies to develop innovative automation solutions since, currently, neither apparel brands nor manufacturers are likely best positioned to develop disruptive technologies. According to nearly 80 percent of survey respondents, access to advanced

manufacturing and the respective intellectual property will become a competitive advantage (J. Andersson et al., 2018). Thus, companies need to decide their best path in order to achieve a competitive advantage in the market and partnerships will play a key role here. Mass-market apparel brands and retailers with financial tools to invest in technology firms are more likely to success and should definitely consider doing so.

Last, but not least, financial partners, such as private equity or venture capital firms, can also play a critical role in the ecosystem of partnerships; in fact, they can be involved in investments in technology companies. But maybe even more importantly, they could play a crucial role in making capital investments to enable local end-to-end supply chains in frontier reshoring countries.

## ***Chapter 3: THE HOSIERY SECTOR ANALYSIS***

### **1. THE HOSIERY SECTOR**

#### **1.1 Description of the sector**

Hosiery refers to as legwear as it is a garment directly worn on the feet and legs and their purpose is to enhance their shapes. In order to understand which companies are involved in this sector, it is useful to underline the following common elements: the kind of product they produce, and the needs that this category satisfies, such as both styling and protection needs.

The categories belonging to the hosiery sector are:

- Socks;
- Tights;
- Pantyhose;
- Nylons.

The first category, socks, is considered as the largest segment in the hosiery sector in terms of value and volume sales and they have evolved from a simple accessory to a more sophisticated product due to the continuous innovations.

Furthermore, companies are usually specialized in the production of one of the above categories, as the technology and knowledge required for each of them is quite different and unique. Fashion and manufactured fibres have been responsible for many of the developments in hosiery and the goods belonging to this sector are made by knitting methods such as plain, rib, mesh, micromesh and jacquard.

During the years, the attitudes of women toward this kind of products changed significantly as nowadays they prefer to have bare legs instead of wearing hosiery in order to feel more

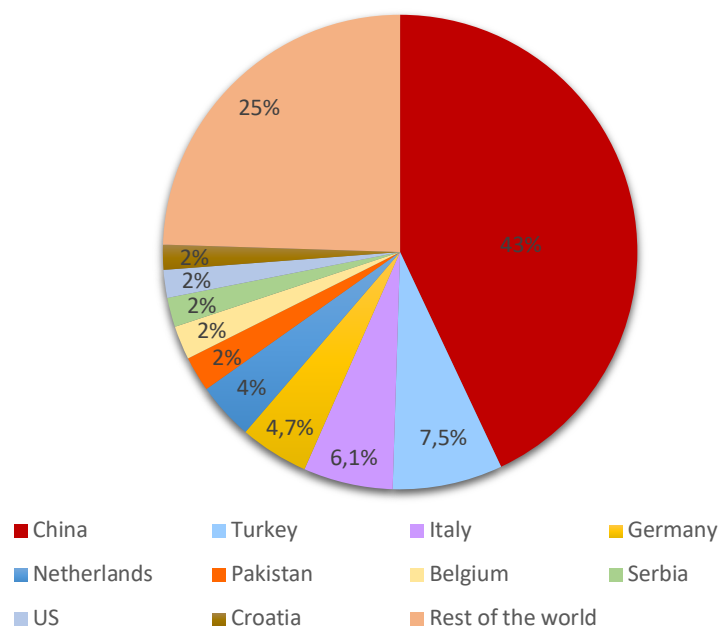
comfortable and fashionable; this led the sector to become more and more challenging for marketers in the global hosiery market. Anyway, the hosiery sector is still an important reality which involves a complex supply chain and even though it has been through a period of decline, it is likely to grow in the next years.

### 1.1.2 Main producers

The hosiery sector is responsible for the worldwide revenue of 61,817m \$ in 2018 and most of them are generated in China. Hosiery segment is expected to grow annually by 4.1% (Statista). According to the data, it is divided into three main areas:

1. Europe, where the most important companies are located in Italy;
2. Middle East, where the main producers are placed in Turkey;
3. Far East, where China is the leader.

Figure 7: Worldwide export share (2018)



Source: ITC Trade Map

When we look at the export value (figure 7), the hosiery sector is responsible worldwide for about 14m \$, where, according to the figure, China has the strongest position in the market, in fact it is covering the 43% of exports in the world; it is followed then by Turkey

with 7,5% and immediately after by Italy with a share of 6,1%; Even if, in the last two years Italy has seen a breakdown of 4,1% being overtaken by Turkey which has instead increased its share of 3,6%, it is still remain the main European producer in the hosiery sector.

In this view, China has a strong power into this sector, as it is one of the main countries where companies outsource their manufacturing process; in fact, in China there is mainly one industrial district specialized in the hosiery sector located in the Zhejiang region and which will be analyzed in the next paragraphs.

On the other hand, from a reshoring prospective, the data show Italy as the most attractive European location for the hosiery manufacturing. In fact, according to Sistema Moda Italia (2017), at the worldwide level, two of the most influential players in the hosiery sector are from Italy: Golden Lady Co. and CSP International Spa, underling the importance this country has in the market. The main region where both companies produce most of their products is located in the industrial district of Castel Goffredo, which I am going also to analyze in the next paragraphs.

## **1.2 The production process in the hosiery industry**

The production process in the hosiery sector can be divided into five stages but it has two main characteristics:

- Every step originates an independent output which can be easily moved and conserved, so each firm can decide its own organization differently, for instance using sub-contractors for many activities and focusing on just one or two phases;
- Standardization of the production process is at the basis, as it is the same for all the hosiery products.

Below, are described the five steps that take place in the hosiery production process:

1. **Texturing:** once the fibers are produced, they are transformed to use the yarn to knit the socks; there are many different texturing processes, each one depending on the nature of the fibers which the yarn will be made of, such as cotton, spandex, wool, bamboo, nylon. This phase is “capital intensive” as the machines used are

very expensive; for this reason, most of the factories buy the bulk yarn from suppliers instead of making themselves. As the variety of yarns needed to make socks increases more and more, it is more convenient for companies to buy rather than make it for every order.

- 2. *Knitting*:** in this phase flatbed machine are used, in which the yarn is carried back and forth, or on a circular machine in which the yarn is taken into a spiral. The first one is not very used, even if in recent years more and more items have been developed with them, especially fishnet socks and tights; the latter is the most spread technique in the industry, which can be distinguished between double and single cylinder: the difference is that with the double cylinder, socks' rib has double layers which can be separated; with single one, the rib has only one layer and it is more suitable for simple designs and one color socks.

In this step, workers presence is very important, as they have a central role in the quality control; even if knitting activity depends on both workers and machines, the labour cost is limited as one employee can check over ten machines. Furthermore, also the investments costs in machines is limited, as it can vary between 5'000 Euro and 40'000 Euro depending on the quality and brand of the machine, which is an amount affordable even for small companies.

- 3. *Assembling/linking/sewing*:** this step concerns the toe linking and the assembly of tubulars (in the case of tights). It is possible to distinguish between hand linking and machine linking. The first method is suitable for small-medium firms, where the cost of this phase depends on the number of workers involved; on the other side, the automatized way is adopted by large firms which have the resources to buy proper machines for this stage. However, usually linking step is outsourced to specialized factories.

- 4. *Dyeing-fastening-boarding*:** the dyeing phase can take place in different ways: for cotton socks, the factory usually buys dyed yarn to knit the socks, so there is no need to dye it again; for synthetic yarns, these can be dyed at the end of linking

process, keeping the original yarn colour until this moment. Factories in charge of this process are dyeing houses highly specialized in this step.

The socks then need to be ironed/boarded, this means that through high level of temperature, socks assume a proper shape and look and so it is ready to be packed. Usually this phase is taken in-house, as most of the companies have boarding machines.

5. **Packaging:** at this last stage of the production process, there are two types of packaging, by hand or by machines. The main difference is that the first one is related to the number of workers used in this stage, while in the latter the cost depends on the machine costs which can be afforded by large factories; furthermore, through the automatized way the alternatives are limited and the set-up is fixed which is not convenient in the hosiery sector, reason why it is not very developed in the industry. Most of the time, in fact, packaging is made by hand in order to adapt products to customers' requests.

The below table reassumes all the main steps of the production process, underlying that the phases that socks manufacturers are more inclined to outsource are texturing, machine-linking, dyeing and machine-packaging; furthermore, the workmanship cost is higher in the hand-assembling and packaging steps.

Table 1: manufacturing phases

Phase	Technology modularity	Minimum efficient scale	Labour intensive
Texturing	Low	High	Low
Weaving	High	Low	Low
Assembly			
<b>Hand</b>	High	Low	High
<b>Machine</b>	Low	High	Low
Fastening – boarding	Medium-high	Low	High
Dyeing	Low	High	Low
Packaging			
<b>Hand</b>	High	Very low	Total
<b>Machine</b>	Low	High	Low

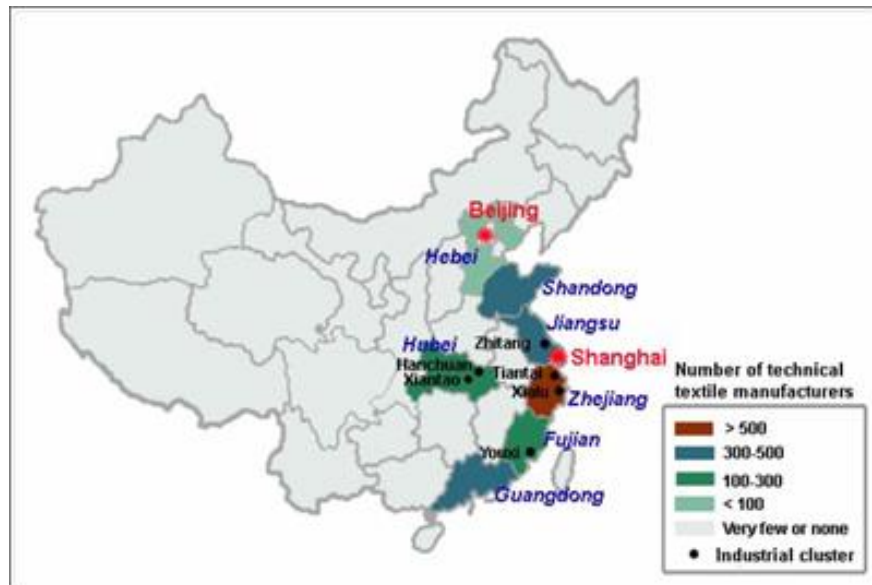
Source: Adapted from *Euro e distretti industriali*, G. Brunetti et al. (2000)

## 2. THE HOSIERY INDUSTRY IN CHINA: DATANG INDUSTRIAL DISTRICT

Chinese clusters are typical industrial districts, which are identical with the nature of Chinese manufacturing firms. To identify the models of clusters occurring in this country we can think China as a “factory of the world”, where individual regions and industrial cities have been highly specialized in the production of certain kind of goods and have become a world centre of that production. Most of the industrial clusters in China have emerged spontaneously and during the years the government has given all kind of supports to their development process; nowadays there are a lot of clusters existing and most of them are located in the Eastern part of the country; among the 96 textiles clusters, 37 are located in Zhejiang which is the main region where industrial districts are, 31 in Jiangsu, followed by 28 in Guandong, 15 in Fujian and 14 in Shandong (figure 8).



Figure 8: Chinese textiles clusters map



According to the map, the biggest hosiery industrial district is located in Datang industrial district in Zhuji area (Zhejiang Province) which has been labelled as “China’s sock town”; in fact, it is the largest hosiery manufacturing base in the world and it has the biggest socks production, sales and export in China. It produces around over 8 billion pairs with annual output around 17 billion RMB, corresponding to a third of the global market share, effectively creating two pairs of socks for every person in the world. Over the past three years, the district invested about 5 million RMB in creating an industrial park for innovation, shifting from being the home of traditional socks manufacturers to a modern production centre for socks.

## 2.1 Description of Datang district

Datang cluster born in the early ‘70s when some educated urban youth from Shanghai moved to Datang village, bringing hosiery manufacturing technology and market information. With their help, the first hosiery manufacturing enterprise was established based on obsolescent knitting machines; in fact, the process was so simple that included only knitting and dyeing, resulting low-quality and poor product line.

In 1988, Datang township was established by merging the villages nearby with Datang village, along the main roadsides of which had been agglomerated numerous stalls and shops supplying socks, materials and parts for hosiery machines; at the same time the government permitted this free economic activities as a small fair market and the hosiery industry and marketplace had tremendously developed. In 1994, the most advanced knitting hosiery equipment was introduced from Italy and a couple of years later it became popularized within the district, so Datang district was able to keep ahead competitors in terms of hosiery manufacturing machinery, giving it a huge advantage in the market. In fact, from that moment, hosiery manufacturing shifted from side-line production to main business in Datang.

The transformation from collective enterprises to private economy, occurred after the adoption of “Household Responsibility System” in the early ‘80s in Zhuji area, promoted the rapid development of family enterprises and the local policy of “developing industry for a powerful town” issued in 1994 had strongly supported the growth of the industry in this region. Towns in this district adjusted their industry development strategies that turned to focus on developing hosiery industry. Among 1996 and 1997, the increasingly expanded market and high-quality requirements stimulated on one hand the expansion of manufacturing scale and on the other promoted the division of work more detailed and stretched the hosiery value chain. As a result, the process had been specialized as a regional production network into about ten complementary activities: material making or sales, machinery and complements supply and repair, computerized pattern moulding, knitting, sewing, printing and dyeing, shaping, packaging and sales.

In later ‘90s, through the foreign non-located trading companies, Datang cluster began to focus on exportation and in 1999 the position of “China’s hosiery hometown” was adopted. According to Liu et al. (2013), the foreign trade in Datang has been developed and enhanced gradually; with China becoming a member of WTO in 2001, a large amount of international capital flew into this district and foreign-related enterprises moved in simultaneously: in this era of globalization, Datang cluster shifted quickly to export-oriented development, in fact in 2001 the hosiery export volume amounted to 22 million US dollars and up to 34.92 million US dollars the year after registering an increase of 58,7%.

In 2006, some famous hosiery machines manufacturers such as Lonati (Italy) and raw materials making enterprises had opened their foreign plants or office there which strongly contributed to the improvement of cluster's productivity. In 2010, the export value of hosiery exceeded 300 million US dollars, exporting its products to more than 40 countries such as Japan, Europe, US, showing great success in both technique and management.

Chinese advantage has been based on abundant cheap labour and export-orientation strategy, no exception for Datang district. In the cluster local embedded enterprises compete in national and international markets and mainly relying on the low-cost advantage in labour intensive. The driving factors involved are connected also to trade networks and the influence of local governments and this system allows a virtual circle of production/trade information and technology spread; in fact, since global leaders play an important role in transferring knowledge along the hosiery value chain, the SMEs involved can obtain more easily information and gain access to global market.

In the next paragraph, I am going to analyse the key factors that made Datang socks cluster competitive not only at local level, but also worldwide, taking into consideration also some challenges it has to face in order to further develop its competitive advantage.

## **2.2 Datang cluster's strengths and weaknesses**

In Datang cluster companies are intricately linked with the hosiery industry, establishing a network structure based on labour division: in the district many activities of the value chain are performed and at every step there are many competitive companies, increasing efficiency and flexibility in the district and generating effective economics of scale, which reduce production cost of hosiery and raise competitiveness.

A network system of specialized labour division and cooperation has been naturally formed and, together with its high-efficient production system and the supporting services, Datang cluster gained international competitiveness. Due to segmentation of the international hosiery market in terms of pattern, the industrial district is adaptive to hosiery markets requiring small batches and diversified patterns in a flexible organization form.

The Datang hosiery cluster is an example of structure focused on gaining profits through economies of scale, where consolidation of efforts effectively reduces drawbacks resulting from demand fluctuation.

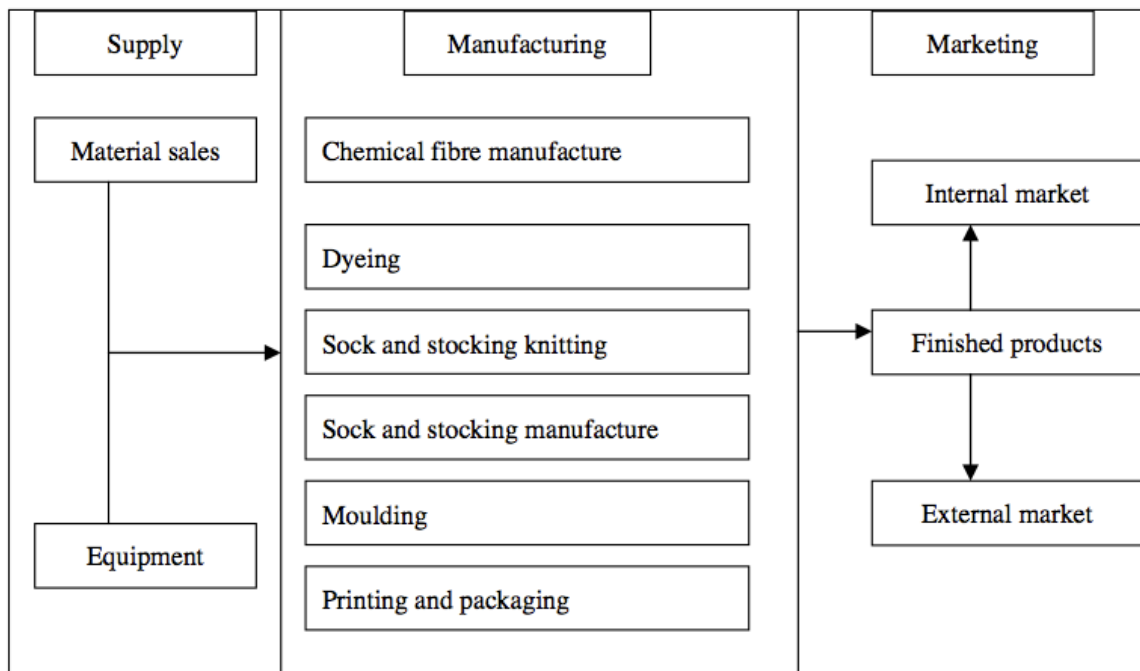
Going deeper in the analysis of the cluster, at the bottom of Datang competitiveness it is possible to identify mainly four distinctive factors such as: its production system, local inter-firm linkages, non-local linkages and local governments, which will be discussed next.

### *2.2.1 Datang's production system*

Datang's hosiery cluster born spontaneously when local SMEs, lacking high technology and well-known brands, specialized in hosiery manufacturing. As we said above, a social division of labour emerged in order to survive to competition and thousands of SMEs emerged specializing in different stages of hosiery value chain. Nowadays, hosiery products in the district include a whole range of socks for men and women, adults and children, from army to sports and fashion, from silk to cotton, as well as pantyhose and tights.

In order to make them, factories use a specialized process intersecting about ten activities: from production and marketing of raw materials to sales and maintenance of hosiery machines, patterns and samples making, hosiery knitting, sewing, printing and dyeing, shaping and packaging as well as sales of finished products (figure 9). The result is a vertically disintegrated but yet flexible structure which exploits the effect of economies of scale and scope. In fact, most enterprises specialize in one or two stages of the industrial value chain, while just a few large firms are vertically integrated.

Figure 9: Datang's activities distribution



Source: Adapted from Wang, 2007

The significant advantage of flexible specialization is collective efficiency: as the hosiery market is influenced by seasons and fashions, factories strongly demand for subcontractors in order to respond actively to changing market needs. Due to its collective efficiency, manufacturers in Datang can quickly adapt their production capabilities to the requested market changes.

The production system is also characterized by local embeddedness as the efficient performance of production system in the district relies on every firm to invest in economic activities, counting on the fact that being involved in the same market will shape and share a collective framework. If, on one hand, firms want to be independent and are reluctant to embrace restrictions related to network members, on the other hand, they know the network provides them some benefits and advantages that cannot be achieved if they are not part of it. As a result, local firms share the same knowledge and information and their cooperation has reinforced the collective efficiency and synergy of the production network.

### *2.2.2 Local and non-local linkages*

Linkages among local competitors in Datang enable it to coordinate sudden rise of customer demand. Since Chinese society is well-known to be bounded by informal interpersonal ties at any level of interaction, Datang district is also characterized by personal relationships which get involved almost into all business activities. For instance, firms which have to face an urgent order, will seek help from neighbors; thus, competitors might temporarily get into cooperation when necessary, sharing technology and market information and at the same time competing with each other. However, since the knowledge spillover has short-time profits, these firms still tend to neglect the importance of cooperation with competitors.

Besides the local factors, external linkages also play a very important role in Datang hosiery cluster. Datang cluster is characterized by the presence of numerous SMEs of different sizes. Leaders firms in the district have developed a more stable and wider supplier system, connecting the cluster with outside market; it enables them to monitor closer changes in consumer demand and to respond to it as fast as possible, moreover they gain also a stronger negotiating power to bargain and contract with firm outside the district. For instance, leading firms in Datang often outsource dyeing and moulding process to Pujiang city and employ highly skilled labor, like professional designers from Hangzhou or Shanghai; most of the time, these firms import from outside of the district machinery and suppliers are mainly located in surrounding areas of the cluster.

The Datang cluster is also encouraging technicians and professional from outside to move into the district as Datang cluster, being a rural region, has too limited technological capabilities to support its development.

Furthermore, several larger enterprises in the district have started cooperative projects with universities in Zhejiang in order to improve the local hosiery manufacturing capabilities, including the development of computerized knitting machines and trained workers. In this way, the cooperation will help the cluster to develop a new model of flexible production decreasing the cost of importing machines and will create a further pool of technically qualified workers.

### *2.2.3 Local government*

Datang hosiery cluster does not receive any direct assistance from central government, while the local government is still playing an important role in the cluster's development. As many staff members run their own business, the local government itself has become a hybrid agent; thus, the collaboration between local enterprises and government has led to an economic growth through the engagement of both parties.

The functions of local government can be divided into three main areas. First, it has the role of main provider of technology and market information, as well as spreading computer knowledge and to build homepages for product promotion through internet. Second, the local government is also responsible for the establishment of industrial parks and trade markets for the transaction of materials, machinery, finished products, logistics and labour resources. It controls also the expansion of moulding and dyeing factories in order to reduce pollution levels. Finally, the local government is also involved in the promotion of district brands to improve local reputation: for instance, Datang cluster was launched as a collective brand on global markets at national socks and stocking trade exhibitions.

Eventually, we can conclude that the strength of Datang cluster lies also on the dynamic alliance between private actors and governmental interventions which play an essential complementary role; in fact, through this support, firms have been able to create their own market specialized in hosiery manufacturing. This system of public intervention represents one of the most original features of the cluster.

### *2.2.4 Datang challenges*

Although, Datang cluster have become a very competitive industrial district in the global market, there are some characteristics to take into consideration as risk factors, such as

- *Fragmentation and lack of horizontal linkages.* As Datang has been developed on the model of "one product per village and one sector per town", this approach has been very useful at the early stages of development in order to fully mobilizing the town's resources based on their competitive advantages. However, in the last years, as the industrial district gained success and competitiveness, the high level

of fragmentation might limit its human and technology resources access, while instead, if Datang cluster started to cooperate also with other town specialized in the same sector, it would gain greater economies of scale and a deeper capacity of innovation.

Furthermore, the district, as described above, has strong vertical linkages, but the horizontal one among similar firms are weak, which could affect their collective efficiency and innovation in the long run; in fact, the absence of long term inter-firm relationships is the main factor that determines the low-level of technical and innovative capabilities.

- *Lack of skilled technical and managerial personnel.* The percentage of employees in the district with a college degree is quite low, with the majority having only a senior secondary education or below. On the other hand, because of low-end nature of the cluster, due to its family-based nature, it has difficulty attracting skilled talent and thus, in the long run, it might be difficult to keep its competitiveness in the market. As I mentioned above, though, the district is trying to attract new talents through projects with universities and other entities.

### **3. THE HOSIERY SECTOR IN ITALY: CASTEL GOFFREDO INDUSTRIAL DISTRICT**

Castel Goffredo industrial cluster is located between Mantova and Brescia provinces and it corresponds to the Italian hosiery sector (figure 10).

The core products of the cluster are socks and tights but also the production of related machines and fibres. For many years the structure of the industrial district has been characterized by the horizontal integration between micro and macro companies with the simultaneous presence of sector's brand leaders such as Golden Lady, Filidoro, Pompea and small similar firms and artisans which constitute the 80% of the entire production process. Nevertheless, in more recent years, several SMEs decided to specialize their activities in the sector of private label due to the consumption changing in the whole market, whereas artisans started working for third parties.



Figure 10: Castel Goffredo industrial district



### 3.1 The evolution of the district

Castel Goffredo industrial district was born in 1924, with the opening of the very first firm “Calzificio Noemi” which was specialized in the production of women silk socks. At that time, it was the biggest company in the district, until the beginning of 1950s when its business collapsed and the firm had been closed; on the other hand, from this moment on, small realities had the chance to develop their business into hosiery sector giving birth to the district of Castel Goffredo as it is known nowadays.

However, there are other factors to take into consideration that stimulated the spread of the district, such as:

- The availability of professional knowledge and high level of specialization in socks production in the area;
- Entrepreneurial attitude;
- Availability of financial resources;
- Collaboration with agricultural workforce;
- Availability of huge spaces to place the production machines;
- Proximity to the production area of socks machines which had the effect to decrease the costs and create synergies between socks artisans and machines producers, such as Lonati located in Brescia and world leader in the socks machines sector.

Nowadays, Castel Goffredo district is characterized by a network of specialized SMEs which operate at any level of the value chain and cooperating between them in order to produce the final product; in fact, there are just a few firms that has its own autonomy in the production process, while the rest of firms are vertically integrated and specialized in one or two steps of the process, becoming dependent from one another.

As the district relies on highly automated production process, the labour cost is limited; the district has been able to avoid partially the phenomenon of outsourcing as most of the steps of the process are taken inside the district, but also because of the low productivity and reliability of low wages countries, like Far-East countries and the lack of qualified contractors for the production stages.

However, during the years, the district has delocalized small parts of the production process, especially labour-intensive phases such as assembling and sewing, which are most of the times outsourced to Eastern-Europe.

In the past years, the core activity of the district was just the production of socks and tights, while supporting activities such as marketing, distribution and management of the products were not well developed. Nowadays instead, there is more concerning among the cluster about these activities; in fact, marketing and communication activities have become a tool of innovation and used to bring goods in the market.

Another activity in which the district has invested its resources is distribution channels; in fact, until the end of 80s the distribution was based on wholesalers while in the last years the retail industry gained more popularity thanks also to new sales methods such as franchising.

Castel Goffredo district hosts the 80% of the entire Italian socks' production, 60% of the European production and 30% of the worldwide one. In order to enter into foreign markets, the strategy that SMEs mostly adopt in the district is through private label contracts, with which the firms can exploit the reputation of Italian manufacturing without creating and consolidating its own brand; in fact, as mentioned before, there are just a few firms in the district which were able to have their own brand such as Golden Lady and Pompea.

Furthermore, in the industrial districts “community and firms tend to merge” and Castel Goffredo cluster proves that; indeed, there are many different institutions which are working together to guarantee the existence of the district, such as:

- A.DI.CI: Associazione Distretto Calza e Intimo;
- Sistema Moda Italia, which is an organization of Italian textiles industries, helping firms to solve production issues;
- CSC: Centro Servizi Calza;
- Associazione degli industriali di Mantova, which offer consulting activities to firms.

### **3.2 Strengths and weaknesses of Castel Goffredo district**

As Datang cluster, also Castel Goffredo industrial district has its strengths and weaknesses. There are many factors which have been fundamental for its development and helped the district to stay alive and go through the era of manufacturing outsourcing. Between there factors, the most important to highlight are the following:

- *The structure of the district*, where it is possible to find all the resources needed in the production chain; in fact, as mentioned before there are both small and big companies working together in order to keep the district alive;
- *Professionalism*: the goods in the district have been produced since the II WW, making the workers highly skilled and with a deep knowledge and tradition about the process, giving to the location an important competitive advantage;
- *Technology and process innovation* which is possible thanks to the strong relationship between socks producers and machine suppliers; in fact, the firms in the district can adopt the latest machines earlier than any other competitors in the market, which is another unique advantage the district has.
- *Export culture* which is fundamental for the district existence as exporting products to foreign markets is the only strategy that allows the district to stay alive.

On the other hand, there are some characteristics in the district which can be considered as risk factors for its future developments, such as:

- *Poor trade culture*, as most of the companies are focused on the production process, leaving aside most of the managerial aspects, especially the one concerning trade which is necessary for the survival;
- *Fragmentation of the district*, as own-branded firms in the district may be seen as a threat for smaller manufactures specialized in one or two steps of the process and so for the survival of the district itself in the long run;
- *Availability of technology*, as the machines can be implemented and used by low waged countries and this can be dangerous in the long run as these countries exploit the second mover advantage in the market using the same technology of Castel Goffredo district.
- *Decreasing of the expertise*, in fact nowadays workers have less technical skills than in the past, while on the other side the labour cost has increased, so it can be challenging in the future to keep the quality of manufacturing as the district was used in the past.

### **3.3 Main players**

The analysis of the production process in the hosiery sector is important to understand the different relationships between main actors and activities performed which are fundamental for the final product value in the socks manufacturing. As shown in fig. 5, despite the producers, there are other different realities involved such as: producers of yarns and producers of technologies upstream of the production process. The former is important because of the quality of the yarn in the final product, the latter instead gives a great contribution to the innovation of the process, giving the chance to firms to gain a competitive advantage in the market, as mentioned before.

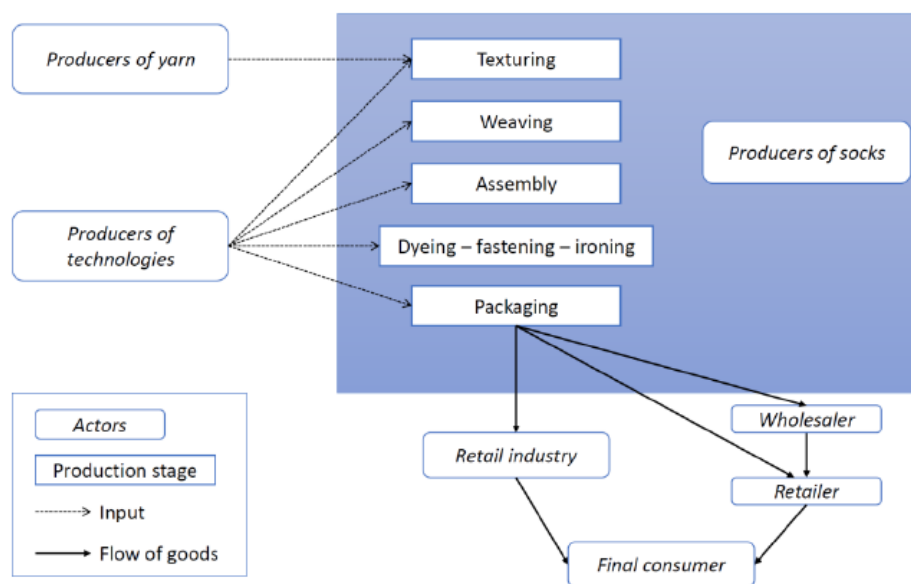
Yarn producers are highly concentrated as not many of the yarn producers are in Europe; even if in the last decade new producers from Japan and other foreign countries entered in this reality and many socks' factories started to buy from them as they have cheaper prices. However, firms prefer to buy synthetic yarns by foreign suppliers as the machines

and technologies needed for the process are expensive and their cost is difficult to be absorbed by socks' manufacturers.

On the other side, technologies producers are concentrated in Italy in Brescia province close to Castel Goffredo. The most important at worldwide level is Lonati, which is leader in the sector and its business covers the 80% of the market demand.

The proximity between socks' manufacturers and machines' producers is a benefit for both sides: the former can give quick feedback to let producers to improve their products faster, the latter can guarantee a periodic assistance to their customers; furthermore, as mentioned before, socks' firms have a first mover advantage in the market since they can exploit latest technologies before competitors.

Figure 11: The supply chain



Source: Adapted from *Euro e distretti industriali*, G. Brunetti et al. (2000)

Socks producers differentiate themselves by the type of product they offer: some of them deal with just intermediate steps in the production chain, they are called middle manufacturers and they are highly specialized; others are involved in the whole process until the final product ready to be sold to final customers and they can distribute in the market as private label or with their own brand.

Regarding distribution channels, socks firms have several choices to distribute their goods: one way is the long distribution through the involvement of wholesalers; on the other hand, the firm can choose short distribution channel where the manufacturers have more control over direct sales to final customers, this second way concerns especially firms that have their own brand.

### **3.4 Data analysis**

According with Osseratorio Economico Calzetteria, in the hosiery market with regards to the export, Chinese leadership is unreachable. In fact, looking at the data in 2017, China is the first exporter of hosiery in the world covering the 43%, followed by Turkey with a share of 7,5% and Italy with 6,1%. In addition to that, when comparing these data with 2016, it can be observed that Italy has lost 4,1% and has been overtaken by Turkey; indeed, Italy had a share of 10,2% while Turkey of 3,9%.

However, in the export of collant, a market of 3 billion US dollars, Italy has a share of 23% which is equivalent to the Chinese one; even if, it has to be taken into consideration that in 2007 Italy's share was of 43% and China's was 15% and in 2012 China undertook Italy with a share of 29,3% against 25,7%. Nevertheless, from 2012, China did not increase much more its collant export share, on the contrary, this market looks like to have not found its balance during the years; furthermore, the two countries have definitely two different target: in fact China's quality satisfies the low range of the market serving countries like Japan and US, while Italy focuses on the medium-high range such as EU countries.

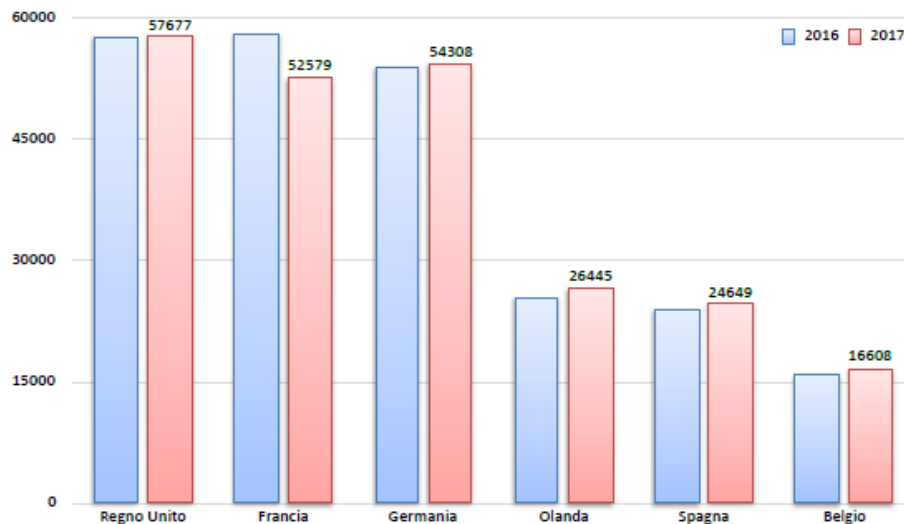
Anyway, the turnover of Castel Goffredo district registered a positive result of 828 million Euro and companies in the cluster remain focused on the export with a turnover share of 56% equal to 461 million Euro, even if, as mentioned before, this data has decreased a lot in the last year (-4%) due

to many reasons such as: geopolitical factors like Brexit, a decrement in the consumption in mature markets, China and Turkey competitiveness and fashion influence which brought young women to not use collant as often as in the previous years.

The first hosiery export markets in which Castel Goffredo district is involved are United Kingdom, France and Germany (figure 12); these countries show mostly a bit increasing of

exports, except for France which has decreased, however the real decrement took place in 2016, year in which UK lost 7,5% of shares, France -2,4% and Germany -0,6%.

Figure 12: Castel Goffredo exports 2017



However, Castel Goffredo hosiery district still remains a very solid and competitive reality worldwide, even if it has to focus on some challenges in the long run, in order to not be overwhelmed by Chinese competitors. The cluster has to exploit its strengths which allow it to be one step forward in the market offering something that Chinese cannot:

- Investments in research and innovation in order to give more and more importance to pantyhose, in order to switch it from a simple accessory to important clothes in women outfits;
- Investments in eco-sustainability which will be an important element in buyers' allocation decisions in the next years;
- New distribution channels, such as e-commerce which Chinese competitors are already using (for instance Taobao);
- Investments in company management in order to produce more collections in one year, to be available to produce small quantities, to be faster in the delivery, while keeping the precision that distinguishes the district from competitors;
- improving the cooperation between firms working on same projects, while they are still keeping their independency.

#### 4. CONSIDERATIONS ABOUT CHINESE AND ITALIAN REALITIES

What emerges from the analysis of the two districts is that they have some similarities such as the development of the district through groups of small families' workshops and factories which became more and more structured turning them into a series of SME agglomeration.

However, during its development, Datang cluster adopted some unseen measures that made it differ significantly from the Italian industrial district in Castel Goffredo.

On one hand, one of the key factors that contributes to the development of Castel Goffredo cluster is the concentration of enterprises in the same location specializing in the same activity and this allows the spread of innovative systems of cooperation which can be either formal or informal, giving a competitive advantage to the cluster and compensating what enterprises lack in size. This strong relationship between firms in the district leads to a more rapid adaptability and flexibility than isolated ones.

On the other hand, this virtual network between firms specialized in the same activity within the cluster is absent in Datang's, as it is characterized by an insular culture and a strong independence from one another, thus there is little mutual assistance and long-term cooperation. This absence of relationships, which are the basis of the effectiveness of Castel Goffredo district, determines a low level of technical and innovative capabilities in Datang cluster. So, if inter-firm relationships are so weak and the innovation activities have been low-level, what can the dynamism of the cluster be attributed to?

Although Datang cluster has not strong inter-firm relationships, it definitely can rely on the role of trade and its networks, which plays an innovative role in cluster's development. As all the other towns in Zhejiang province, Datang has created its own cluster originally for the trade of produced goods at provincial level, later at national and international level, rather than for the manufacture of industrial goods; thus, a number of trade networks have been developing since then, which explains in part the development of the cluster.

Another aspect to take into consideration is the nature of labour market. The rapid growth of Datang district was initially supported by a local, rural workforce and recently it has seen an increasing number of external labor, which is a necessary implement to the cluster



development and to the spill over of knowledge within the district. In fact, in the Chinese district among 20 thousand employees, more than 80% are made up by workers moving from other regions.

On the other hand, Italian district of Castel Goffredo can still boast a long tradition of knowledge among workers which has been handed down by three generations. The deep spillover of professional knowledge and long tradition is still a competitive advantage for the district which can rely on its own high-quality products inimitable by the competitors in the market.

After having analyzed the hosiery sector and given an overview of main players, focusing on the two most important and yet different realities of the industry – Datang cluster and Castel Goffredo district –, I am going to analyze the study case of a company, ALFA A/S, which has outsourced its production in Datang cluster; afterwards, I am going to study a possible reshoring of the manufacturing process to Castel Goffredo industrial district in order to understand if this strategy can be more or less affordable and effective for the company.

## **CHAPTER 4: TRADEMARK TEXTILES A/S CASE STUDY**

### **1. RESEARCH METHOD**

After the analysis of the hosiery sector, it has been possible to establish a case study about company Alfa A/S. As we are going to see in the next paragraphs, among this company's suppliers, there is also Trademark Textiles A/S, a Danish private label. The study regards the analysis of the current outsourcing strategy adopted by Trademark which has placed the socks production of Alfa's brand Beta to China; and a possible adoption of reshoring strategy to Italian industrial district of Castel Goffredo.

In this era, where automation is becoming a key player in the apparel industry favoring the reshoring of the manufacturing, I have found interesting to verify if this concept might be applied also to Trademark, which is a typical example of SME that have taken advantage of the outsourcing trend a few years ago, placing all the production to low-labor cost countries. Thus, the aim of this case study is the comparison between the actual sourcing model adopted by Trademark and the potential one based on reshoring strategy.

Obviously, in order to proceed with the case study building, it has been necessary to collect data regarding Trademark, the customer Alfa A/S, the dynamics and the scenario behind the outsourcing strategy adopted and finally data regarding factories where to reshore the production process.

The first step of the research has been the collection of internal data from the Trademark's archive in order to gain information and numbers about customer Alfa A/D and its brands including Beta. After that, I have organized interviews with Trademark's employees in order to understand the daily work and the relationship with its Chinese socks' supplier factory X. It has been useful to understand also their opinions about a possible reshoring.

Regarding this last point, in order to collect some data from potential Italian suppliers, I made also interviews with them following the supplier's selection method described below. I have gained information and data about 12 factories located in the industrial district of Castel Goffredo in order to highlight which is the tendency of the cluster and to be able to compare it with the actual Chinese supplier.

Once I had elaborated all the data, it has been possible to state my final conclusions about a possible reshoring.

## **2. ALFA A/S COMPANY PROFILE**

Alfa A/S is an international, privately held family-owned fashion company based in Denmark. The company was founded in 1975 and originally its focus was on women's fashion. It introduced children's clothing in 1986 and menswear in 1988. The company had a turnover of 3.2 billion EUR (financial year 2017/18) which has increased in the last year to 3.5 billion EUR (+7%) and it employs around 17.000 people.

Alfa A/S has a range of more than 20 individual brands that provide fashion clothing and accessories for women, men, teenagers and children; its brands and products are available online, in about 2.750 branded chain stores, 15.000 multi-brand and in department stores across Europe, The Middle East, North America, Latin American, Australia and India; even though, Scandinavian market is the first and biggest one in which it operates. Furthermore, it has also an headquarter in China, which is an independent company designing its own collections for more than 7.000 stores in the country.

Alfa A/S has always aimed to expand into new markets which has been the main driver of its international growth; its expansion program was meant to help in maintaining its competitiveness into the international branded clothing market. Another key factor is the development of its portfolio which varies in terms of targets from kids to adult clothes both male and female: in fact, in the 80s, the company started to focus not only on women's clothing market, but it sought to broaden its scope to include children's and men's apparel markets. At the same time, Alfa A/S took steps to position itself within the fast-growing

trend toward branded and designer-label clothing. Years later, the company also started to be competitive in the accessories market and in the luxury-oriented brand market.

Alfa A/S works broadly in the value chain with a focus on sustainability and recognized international standards. For this reason, the company works with its suppliers to promote responsible production practices in the supply chain regarding environment protection, the use of chemicals, healthy and safe working conditions and workers' rights. This is an important topic which the company focuses on, as it has no ownership interests in the production chain, but it cooperates with selected suppliers in Asia and Europe. In fact, suppliers have to meet t Alfa's minimum standard in order to be selected; furthermore, the company has developed also a Code of Conduct to support ethics and behavior that it wants to promote through the supply chain and it is addressed to any supplier and his subcontractors who manufacture for Alfa A/S.

## **2.1 Brand positioning**

As mentioned above, the company Alfa A/S owns many brands that has developed across the years in order to improve its portfolio and to enter in different markets with different targets: in fact it covers the apparel market offering clothes for kids, but also for teenagers and adults; it has also a luxury-oriented brand and a maternity clothing collection; furthermore it entered in the accessories market. These are evidence of a company that has become one of the fastest-growing retail clothing groups in the world.

The analysis that will follow is going to focus on one brand of Alfa A/S company: Beta, which was one of the first brands that has been launched and one of the largest brands in the company. Its vision is to fulfil a need for good quality, on-trend clothing at affordable prices; in fact, Beta is the choice for fashion-conscious, young women who wants to dress well and pay less.

According to its business strategy, the brand focuses on women as its own target and its market positioning is the mass market which is characterized by low prices and so cheap but trendy clothes, at the same time, the quality is mid-low or low in order to keep the costs down; this is the typical market segment on which fast-fashion brands belong.

The core business of Beta is apparel which involves different product categories such as accessories, bags, shoes, underwear and lingerie, denim, apparel and swimwear.

Today, Beta has more than 1000 stores in Europe, 1600 stores in China and it is experiencing a rapid growth in both India and Canada; furthermore, it is represented in 45 countries with more than 3800 point of sales through wholesales customers, shop-in-shops and some Europe's largest online retailers.

Regarding its socks' styles and production, usually Beta launches 7 collections per years, which means one collection every month and a half as proof of its fast fashion characteristic. It is possible to highlight two styles for every collection:

- Basic socks styles, which refer to styles that are repeated over time and collections;
- Fashion socks styles, which are exclusive of any specific collection.

## **2.2 Suppliers' selection**

One of Alfa A/S suppliers is the Danish company Trademark Textiles A/S, a private label manufacturer specialized in the production of socks and underwear for men, women and kids, canvas shoes, flip flops, textile printing and accessories.

The brand Beta started a partnership with Trademark Textiles 12 years ago becoming one of the most important labels which the supplier produces for, especially socks and tights. Beta usually launches seven collections every year and so Trademark has to develop design proposals to the customer's buyers; when the styles are approved and also the prices and delivery dates have been decided, Trademark starts its work to place the orders to its suppliers which are mainly located to China, Bangladesh and Turkey.

Obviously, there is a supplier's selection process in order to make sure that the factory where the orders will be placed, respects international standards and also the requirement's that both Alfa A/S and Trademark Textiles A/S.

As mentioned above, every product is located in a specific region, for instance factories that produce socks are mainly located in Datang's district in China. Once the location has been defined, it is important to collect information about factories across internet and by

sending them emails in order to open a discussion with them and to check if there is any kind of interest from both sides.

This first selection is based on some basic parameters in order to check if the potential supplier is suitable to develop the style requested:

- The core business products that the factory produces;
- Quotation prices;
- Size of the factory: it has not to be too big because the quantities are not high and there would be the risk to lose the priority of the production;
- The MOQ (minimum order quantity) of orders;
- Lead Time, both for samples and for production: usually the production of socks takes around fifty days;
- Capacity of the factory;
- Number of workers employed;
- Whether the process is in-house or not: usually it is preferred that the process is in-house in order to have a better control over the production;
- Type of machines used in the production process;
- Audits: it is very important that every factory has audits that prove they meet international standards; among the most important, there are Oeko-tex Standard 100 which is specific for the apparel sector and it certifies that the factory is not using harmful substances and it is environmentally friendly; and BSCI (Business Social Compliance Initiative) which is a leading supply chain management system that supports companies to drive social compliance and improvements within the factories in their global supply chains.

After the first selection, if the factory satisfies the requirements described above, there is the second phase regarding the physical inspection of the supplier in order to check if also the environment might be considered appropriate for Trademark Textiles A/S and its customer's standards.

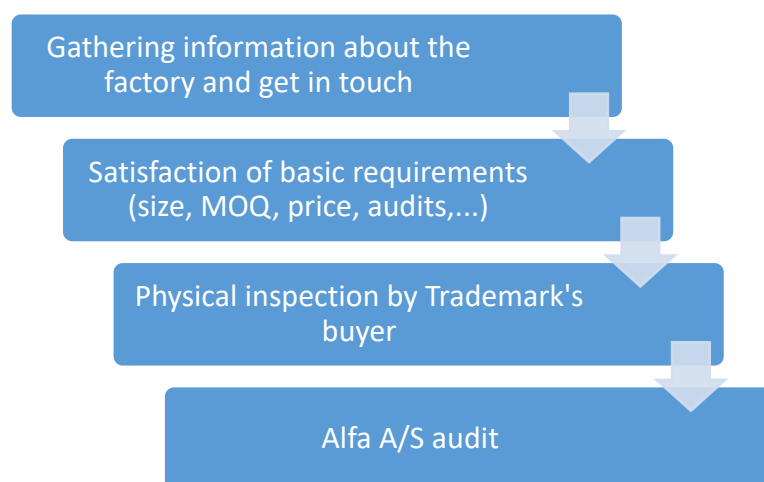
Regarding the Alfa A/S requirements, every factory that produces items for its brands must meet an additional audit's standards which has been drafted in order to evaluate the social aspects of the supplier, such as:

- Workers welfare;
- Workers salary and hours;
- Workers safety and health;
- Management system;
- Freedom of association;
- Environment.

An inspector of a third, independent company will evaluate the factory's compliance and if one or more categories have not been satisfied, an action plan will take place in order to reach the required levels. Usually, the level of the compliance is given by colors: red means the factory is not suitable, green instead means that the supplier meets all the requirements.

Furthermore, besides the requirements above, there are also some other criteria used by Trademark in order to evaluate the factory, which are: the willingness of the supplier to engage in a long-term relationship considering the potential of the customer; this refers to the development of a medium/high number of sale samples for the customer and a low/medium number of pieces/orders at the beginning. And the willingness to help the customer adapting its production plant to it.

*Figure 13: Supplier selection process*



*Source: internal data*

### 3. PRODUCTION PLACEMENT IN CHINA

As mentioned above, Trademark Textiles A/S places most of its production in China, Bangladesh and Turkey. In this case study, the brand Beta's socks production has been placed to a factory located in Datang industry cluster in China, that I am going to call Factory X.

The factory, established in 1981, is a professional manufacturer of socks, tights and leggings. It has around 180 workers and it has almost all the processes in-house: knitting, cutting, linking, boarding and packing; despite for dyeing stage which is allocated to its local supplier.



Furthermore, regarding machines, Factory X has 150 circular knitting machines and all of them are Lonati, plus four Chinese 800 needles machines. A very interesting aspect is that Chinese factory X still relies on manual labor in various steps of the process, while on the other side it is possible to see a high technological advances adoption by factories in Italy as described in the next paragraph. Thus, it is already possible to underline a first clear difference between the two worlds.

Regarding factory X, the MOQ is 3000 per size and per color which is might be a negative aspect for Trademark as the MOQ is too high; so it can be suitable just for basic styles with high quantities, which are repeated styles that will keep running continuously in time enabling the exploitation of economies of scale, but not for fashion collections that usually have lower quantities as they are exclusive just for one collection as mentioned above. Furthermore, the production capacity is about 50 million socks per year, this means that the flexibility that factory X can offer is very high, most of the times machines are available even to satisfy last-minute orders.

Another important aspect is the production lead time, which is about 90 days considering also the transportation which might take even 5/6 weeks.

Obviously, the price is a fundamental part in the supplier decision-making and as in China the manufacturing is low-cost, also the prices are very convenient:



- Basic styles → 0.43€/pair
- Fashion styles → 0.79€/pair

As mentioned before, one important characteristic is the satisfaction on specified requirements requested both from Alfa A/S and Trademark: factory X of course satisfies these standards, meaning that it has the BSCI and Oeko-Tex audits and also the specific audit required by Alfa A/S. Furthermore, it has gained the audit requested by ALFA A/S, meaning that it satisfies all the social requirements demanded by the customer.

### **3.1 Managing the outsourcing relationship**

Trademark and Factory X started their collaboration many years ago when the Danish company was born and developed its first socks samples with the Chinese factory.

After gathered information about the factory and contacted them by email, Trademark's purchasers went to China for their first visit in order to see the environment and when also this requirement was satisfied, they selected some socks from the factory's showroom that would be suitable for customer Beta and asked them a first quotation. After that, since the prices were quite competitive enabling the interesting on the factory, Trademark's designers developed the artworks based on these existing samples to show to the customer.

When the customer has chosen the styles, the first pre-production samples are developed by factory X. The samples' development usually takes 3 weeks which are then sent to Beta after a careful check by Trademark employees. The customer usually gives feedback on the samples before starting the bulk production, so he has the chance to make any change and, in this case, Trademark would place a second pre-production samples' order; anyway, Trademark has the responsibility to share the comments with Factory X before starting the production in order to improve the samples.

The pre-production samples, in order to be approved by the customer, have to satisfy the following aspects: sizes, measures regarding socks (the leg's length, the foot's length, the leg's width) and colors which might involve both printed patterns or knitted ones and they

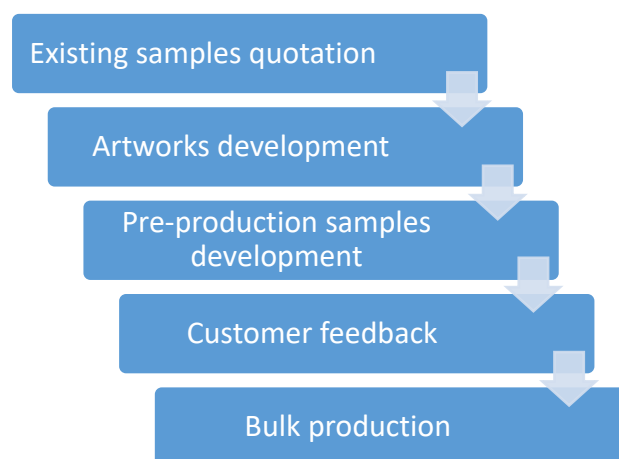
are checked by using the Pantone book: the colors book adopted by most of the factories and companies of the apparel industry.

After the approval of pre-production samples, the bulk production can be planned, which takes around three months: during this period there is a constant communication between Trademark's buyer and factory X's merchandiser in order to be updated and ready to face any issue that comes along. Furthermore, there are also other details that must be confirmed during this period, such as the socks' packaging, the export cartons that have to be used according to Beta's instruction, the forwarder's booking, the bulk production socks' inspection made both by Trademark and by a third independent entity.

Anyway, the most important thing that Trademark has to ensure is to keep the delivery date confirmed to the customer, for this reason every day there is a continuous dialogue with the factory until the delivery of the goods to Beta.

In case of critical issues arise, Trademark has a few subsidiaries placed in strategic parts of China, meaning close to its suppliers and factories. In this way, Trademark can be more reactive to face problems and be physically there to double check the production process. It happens that, when this is not enough, Trademark buyers flight personally to China in order to find a solution and to talk directly with the factory's merchandiser.

*Figure 14: The process between Trademark and factory X*



*Source: internal data*

As mentioned above, Beta usually places seven collections per year which involves basic socks and fashion socks. The main issue that Trademark has with factory X is the high MOQ,

which it can handle for basic socks as they are continuously orders across time, but it does not fit well for fashion socks, as there are not high volume and factory X has difficult to decrease the MOQ, for this reason the price of fashion socks is much higher than the basics' one.

Furthermore, another critical issue during the daily work is the communication, as many Chinese employees do not speak English, and this might enable misunderstandings which implicate a higher probability of generating problems; thus, this leads to a considerable waste of time due to this issue; sometimes happens that the factory does not catch the deadline for this reason, but also because when some problems arise, there is a lack of proactivity and reactivity by Chinese employees. Even though, across the years Trademark's buyers have adopted some solutions to avoid this fact such as communicating the deadline two weeks before the one requested by Beta or by preferring to have a written communication with them.

Also, the lead time of three months might be critical as it might not encounter the needs of customer Beta and its fast fashion as well as the transportation time that need to be taken in to consideration as the forwarder takes weeks to deliver the goods.

On the other hand, the relationship between Trademark and factory X is ongoing for some favourable aspects as the exploitation of economies of scales deriving from the placement of basic socks' orders; regarding this aspect, as these are repeated orders, the factory's employees gain the necessary know-how to improve the manual labor and to make it faster; furthermore, there is less and less need of a daily communication between the factory and Trademark as they are already instructed about how to handle the bulk production.

Another benefit of this relationship is the fact that Chinese employees are very committed to work and they are paid by how many pieces they produce daily instead of by hour. For this reason, they are willing to develop also last-minute orders with also high volumes, offering a very high flexibility to Trademark buyers. Last, but not least, they also can exploit the time-zone difference which is an added advantage especially when last-minute orders are placed.

To sum up, the strengths of factory X underlined above are as follow:

- A very competitive price due to low-cost labor;
- Exploitation of economies of scale and learning curve;
- High flexibility;
- Know-how of socks;
- Time-zone difference;

Obviously, it is possible to foresee also its weaknesses:

- High MOQ for fashion socks;
- Poor English;
- High production and transportation lead time;
- High risk of miscommunication.

*Table 2: Strength and Weaknesses of factory X*

<b>STRENGTH</b>	<b>WEAKNESSES</b>
Competitive price	High MOQ for fashion socks
Economies of scale (basic socks)	Poor English
High flexibility	High production lead time
Know-how of socks	Transportation lead time
Time-zone difference	Miscommunication

#### **4. RESHORING CASE STUDY**

After the description of the outsourcing strategy adopted by Trademark Textiles A/S that sees the placement of the production to the Chinese factory X, the research continues with the study of a possible reshoring to Europe; precisely to Italy in Castel Goffredo’s industrial district, which is the most suitable option for the reshoring of socks’ production, according to data collected in the analysis of the hosiery sector.

The study includes the analysis of four Italian factories according to the requirements explained above, through which it will be possible to have an overview of the district's tendencies and thus to give an evaluation of a possible reshoring to this industrial cluster. These four factories have been chosen as representative samples conducting a research among several suppliers belonging to the district and it is based on the following steps:

- Gathering information of the factories
- Making an interview to each factory in order to check basic requirements;
- Asking for quotations;
- Interviewing Trademark Textiles' employees in order to have a general idea about a potential production placement to Italy.
- Checking existing samples and comparing them with Chinese ones;

Below I am going to describe the data that I have collected for each factory and I am going to call the representative samples as: factory 1, factory 2, factory 3, factory 4.

## **4.1 Data collection**

- **Factory 1**

Factory 1 is located in Mantua and it is part of the Castel Goffredo's industrial cluster. It was born in 1975 and today it has two productive units and a logistic one with 230 direct and indirect employees and 18 agents for the retail. Its core business is focused on the development of socks and tights for women and kids, but it has also a strong presence also in the men segment; furthermore, the factory is well-positioned at international level, in fact despite Europe, it serves also markets all over the world, such as Canada, USA, Australia. During these years, thus, the supplier had the chance to improve its know-how and reaches high level of professionalism and expertise.

Looking at technical aspect it emerged that the MOQ for socks is about 2400-3000 pairs, which, as mentioned before for factory X is quite high; it has all the production in-house adopting 280 Lonati machines with a high technological level and its capacity reaches the

production of 36 million pairs of socks per year. Looking at the price, the quotations are as follow: basic socks are quoted at 0.78€/pair, while the fashion socks at 1.05€/pair, thus we can immediately see the price-difference with factory X. On the other side the lead time is shorter, in fact it is about 50/55 days.

The main styles that the supplier produces are both classical and modern styles and during the years it has always changed machines in order to keep up with the new technologies and the market's demand and to offer to customers a high quality and innovative products; from this point of view, factory 1 would be a good candidate as it might meet customer needs and, make some original proposals, especially for fashion socks.

Factory 1 is a well-organized supplier, focused on quality; in fact socks usually go through four check points during the bulk production and two of them are based on AQL system, which is a very professional quality-check system adopted worldwide and this is a very good point to take into consideration as it is very different compared with Chinese factories where most of the times works do not double check the products.

Another important element, is the fact that factory 1 speaks English, making the communication smoother and decreasing the chances of misunderstanding.

As the factory is quite big, there is the risk that the flexibility to meet customer needs is lower that might be in smaller factories, as they would be less willing to give Trademark the priority for bulk production and work together in order to satisfy the customer; in fact the merchandiser explained that they are more focus on bigger customers and they would be more flexible just in case of high volumes, showing its unwillingness to be solution-oriented.

It is possible to say that its strengths lay on:

- High technological skills;
- High quality of socks;
- Lead time of 50/55 days;
- High level of expertise;
- Good communication.

On the other hand, factory 1 has also some weaknesses that need to be summarized:

- High MOQ (2400/3000 pairs);
- High price;
- Low flexibility;
- Not solution-oriented.

*Table 3: Strength and Weaknesses of factory 1*

<b>STRENGTH</b>	<b>WEAKNESSES</b>
High technological skills	High MOQ (2400/3000 pcs)
High quality	High price
Lead time of 50/55 days	Low flexibility
High level of expertise	Not solution-oriented
Good communication	

- **Factory 2**

Factory 2 is also located in Mantua, in the middle of the industrial district and it has been established in the '80s; by then it has been committed to focus on the production, research and product development, as well as on innovation processes involving yarn, machinery and services. Indeed, the family-run factory allowed for sectoral knowledge and expertise to ensure a strict control of the quality across all the stages of the process; furthermore, it has 150 instructed employees that every day double check all the socks' production.

The factory has a strong National and European presence and its aim is to increase the share of production for foreign countries in order to reach and explore new markets.

The factory is sensitive to the customer needs and trends of fashion in the women's hosiery, and thus it is able to offer a wide range of products; indeed, the company is also a private label which allows it to develop any product and customized it in order to meet customer requirements. In this view, it is possible to say that factory 2 has a high degree of

flexibility; also because, for basic socks styles, it has available an inventory ready to satisfy quickly and urgent orders.

Factory 2 is quite big, and it has a production capacity of 25 million per year and it adopts the latest generation machines equipped with the most modern devices which are able to ensure high quality standards. The production is made almost all in-house, despite for the dyeing phase that is allocated to a neighbor factory specialized in the dyeing process.

The factory has also a quality-price ratio more convenient than factory 1; in fact, for basic socks the price is 0.73€ while for fashion socks it can start from 0.98€ depending on the pattern with an MOQ of 2000 pairs which is much lower than factory 1 and Chinese factory too; so, it would be more suitable for customer Beta's collections.

As factory 1, also this supplier is quite big in the district which could be a problem for the bulk production in terms of priority and also there is the risk that they assign to Trademark a junior merchandiser who does not have the experience needed to support the relationship and to deal with all the issues that arise along the path; another consequence is a longer lead time of 60/70 days to deliver the goods which is a quite long time compared with the fast needs of customer Beta.

During the interview, the merchandiser wanted to underline also their recent OEKO-TEX standard 100 certification which obviously is one of the most important requirements in order to be considered by Trademark and so in this study.

Nevertheless, the junior merchandiser was not very fluent with English language which might be a risk for the communication and might arise easily misunderstanding; on the other hand, she remarked her willingness to work with Trademark showing a higher degree of collaboration than factory 1 when it has been explained to her how the collections of customer Beta are structured. On the other side, the interest to start a collaboration from factory 2 side might be driven by the opportunity to strengthen its position in the European market.

Eventually, many strengths of Factory 2 emerge from its analysis such as:

- High quality standards;
- High technological machines adoption;
- Flexibility and availability for the most urgent requests;



- High production capacity;
- Good knowledge of products and trends;
- Lower price than factory 1;
- Lower MOQ than factory 1.

However, there are also a few weaknesses to take into consideration:

- Trademark would have no priority for its small orders;
- High lead time of 60/70 days due to the importance given to bigger companies;
- Limited experience of the junior merchandiser;
- Miscommunication risks due to the poor English level of the merchandiser that would be assigned to Trademark.

*Table 4: Strength and Weaknesses of factory 2*

STRENGTH	WEAKNESSES
High technological machines	Big dimensions
High quality standards	Long lead time
High production capacity	Limited English
Good know-how	Limited experience of merchandiser
Flexibility	
Lower price and MOQ than factory 1	

- **Factory 3**

Factory 3 is smaller than the first and second ones and obviously it is located in Castel Goffredo's industrial district too.

This factory is family-owned since 1965 and today the family arrived at the third generation passing on the expertise of the tradition across the years. It is specialized in the development, production and distribution of socks and tights of all kinds with a particular attention to natural yarns. The focus is on a careful research of the design and style, but also on the relationship with its own customer and its needs; it also aims to use raw

material of very high quality such as cotton, lycra and polyamide, highly specialized staff and last generation of knitting machines, in order to differentiate its products from the competitors in the market through the affirmation of the Made in Italy, which made possible the development and success of this factory both in Italy and in Europe.

Furthermore, factory 3 has a very high concern about the environment, in fact all its facilities are eco-friendly and in the last years it adopted and promoted products using natural yarns becoming a distinctive characteristic on the market.

The core business of this factory is the production of socks for both men and women; indeed, besides being a supplier focused in the production of private labels, factory 3 has also its own distributor of its brand in five markets: Italy, France, Russia, Spain, Greece. From Trademark's point of view, this might be a risk over the years because the supplier might become a competitor in the market using the know-how of Trademark and bypassing it on the marketplace.

Regarding the production process, it involves: R&D, knitting, stitching, dyeing plant, packaging department and quality control. However, the production is not entirely in-house: the knitting process is realized in the Italian headquarter where it is realized the 75% of the Italian production equal to 25% of the worldwide production. On the other hand, the 80% of the finishing and packaging are realized in their subsidiary located in Serbia. This is another factor very tricky for Trademark, as it prefers to have a supplier with 100% of production in-house. In this way it is easier to relate to the factory and to keep under control the development of the goods.

As mention before, factory 3 aims to have the latest generation of knitting machines and all of them are Lonati's, in order to guarantee to customer a great quality that makes the Made in Italy. The annual capacity is around 10 million pairs of socks and tights divided as follow:

- 4 million of socks and tights for women;
- 3 million of socks for men;
- 3 million of socks and tights for kids and newborns.

Already, looking at the capacity, it is possible to see that factory 3 is smaller than the previous ones and it has 80 employees: this fits with Trademark's profile and expectations. Indeed, this might bring advantages looking at basic requirements; starting from the MOQ, it is much smaller than the first two factories as well as the lead time: the supplier offers a minimum order quantity of 1200 pairs and a lead time of 45 days which is very short time and useful when Trademark has to place quick orders. Looking at the price, it is a bit higher compared with factory 1 and 2: 0.85€/pair for basic socks and 1.10€/pair for fashion socks. Even though the price is less competitive, this is explained by the fact that this supplier uses very high quality of raw materials which of course are more expensive: for instance, polyamide is adopted by factory 3 to combine together with cotton, instead of polyester which is the most common material to use in the development of socks and also cheaper.

Factory 3 looked very willing to collaborate with Trademark and to develop immediately some samples in order to show its products. Having a smaller supplier, as mentioned above, means having the priority over other factory's customers both in the placement and development of orders and in the relationship. Furthermore, the factory is also willing to be flexible in order to meet customer's needs in terms of orders planning and socks styles and has good communication skills which mean that despite the good level of English, it is also very precise in giving information and well-organized.

This factory showed many advantages that might be really appreciated by Trademark, such as:

- Low MOQ (1200 pairs);
- Lead time of 45 days;
- Advanced technologies;
- High degree of expertise;
- Eco-friendly;
- Focus on high quality raw materials;
- Good communication;

Unfortunately, it has also some disadvantages that have an important part in the supplier's decision making made by Trademark:

- The production is not 100% in-house;
- Higher prices;
- It has its own brand.

*Table 5: Strength and Weaknesses of factory 3*

<b>STRENGTH</b>	<b>WEAKNESSES</b>
Low MOQ	No 100% of production in-house
Lead time of 45 days	Higher prices
Advanced technologies	Own brand
Good know-how and communication skills	
Eco-friendly	
Raw materials high quality	

- **Factory 4**

Factory 4 was founded in Casaloldo (Mantua) in 1986 and has many years of experience in the production of socks and tights.

Its strengths points are many and focus on quality control at every step of the production process in order to deliver products in the best conditions possible; obviously, the supplier pays attention also to the design and the perception of Made in Italy: in fact, over the years factory 4 has develop a high degree of experience that helped in the development of innovative collection and to acquire a very competitive position in the market. This had been possible also through the adoption of modern technologies that enable the supplier to quickly respond to the needs of the marketplace and to put together both past tradition and modern know-how. Furthermore, the factory is well-structured and organized and it can be flexible for any kind of distribution channel, especially it is suitable as private label.

Factory 4 has 40 employees and it is the smallest of all the factories analyzed and, on the other hand, this also influences the lead time, which is approximately of 60/90 days and 60 days on reorders, which is much higher compared to the first 3 factories and almost the same as the Chinese factory X, thus it is so inconvenient from this point of view.

Regarding the production department, it has two areas: one for the production of socks and tights with 100 Lonati machines and one for the production of underwear and sportswear.

One important aspect is that factory 4 has also the packing department involved in its production process, where the packaging is made entirely manually; this is very hard to find it in-house, as usually the packaging is made outside the factory and this involve costs that cannot be ignored as we are going to see in the next paragraphs. Thus, this aspect is a very good point that needs to be kept into consideration.

On the other side, the dyeing process is allocated to another supplier in the district based 30 km away from factory 4 headquarter, as commonly happens for most of the knitting factories in the industrial cluster.

The production capacity of factory 4 is a bit more than 7 million pairs annually with an MOQ of 1000 pairs per styles. Regarding the price, the supplier quoted basic socks at 0.75€/pair and fashion socks from 1.00€/pair depending on the pattern. In this case, the factory is even too small for Trademark as the capacity is too low and there is the risk that most of the times there are no machines available for the placement of last-minute orders or not even for orders placed as expected; and the consequence is a low flexibility in terms of production process.

On the other side, as factory 3, also this factory is willing to meet Trademark's needs and it showed a well-organized structure and coordination. It is well-prepared and has a very deep know-how of products and technologies that is willing to share also with Trademark in order to grow up together and build a strong relationship over time.

To sum up, the advantages of factory 4 are several, such as:

- Convenient MOQ;

- Competitive prices;
- Willingness to start a strong relationship;
- Advanced technologies;
- Packing process in-house;
- High level of know-how;

Obviously, it has also some disadvantages:

- Long lead time;
- Small capacity;
- Low flexibility in the production process.

*Table 6: Strength and Weaknesses of factory 4*

<b>STRENGTH</b>	<b>WEAKNESSES</b>
Convenient MOQ	Long lead time
Competitive price	Small capacity
Advanced technologies	Low flexibility in the production process
Good know-how	
Packing process in-house	
Willingness to start a strong relationship	

### **3.2 Considerations about Chinese and Italian factories**

To sum up, it is possible to highlights the differences between Chinese factories and Italian ones, in terms of prices, MOQ, lead time, capacity and audits. I have described four factories as representative samples of the industrial district of Castel Goffredo; however, I have collected data from 12 factories in order to be able to have a higher number of samples to see the tendency of the district.

Factory X is the most competitive one in terms of price; however, its MOQ and lead time is quite high for Trademark standards, while, on the other side, Italian factories can offer more suitable solutions. In fact, what the table below shows, is that in the Italian district

the factories have a shorter lead time and a lower MOQ, even though the prices are higher. In the view of a possible reshoring then, what emerges is that Trademark would deal with higher prices that may or may not meet the target price of customer Beta; although, the MOQ and lead time are two variables that need to take into consideration. The minimum order quantity results to be valuable as the orders quantities of fashion socks made by Trademark, are usually lower than 3000 pairs of Chinese factory X; also, the lead time is more convenient due to the geography proximity to Denmark and also to Europe which is the market is which Trademark operates the most for customer Beta. As many times, it happens to make last-minute orders or simply the fast fashion requires short timing in the production process, this might be a good advantage, in fact, according to the table below, in the industrial district there is the tendency to have a lead time of 2 months more or less.

Regarding the capacity, factory X has the highest annual capacity, which means a higher flexibility than Italian factories, to place immediately Trademark's orders; however, as Trademark orders are have not high quantities, it is also suitable the capacity offered by Italian factories. Obviously, some of them are a little too small, for instance those with a capacity below 10 million socks per years, and this increases the risk to not have machines available for its orders, but the tendency of the Italian industrial district results to have capacity above 10 million socks per year, which is suitable for Trademark.

Table 7: Data comparison between China and Italy

FACTORY	PRICE €/PA		MOQ	LEAD TIME (days)	CAPACITY (million socks/year)
	BASIC SOCKS	FASHION SOCKS			
FACTORY X	0.43	0.79	3000	90	50
FACTORY 1	0.78	1.05	2400-3000	50/55	36
FACTORY 2	0.73	0.98	2000	60/70	25
FACTORY 3	0.85	1.10	1200	45	10
FACTORY 4	0.75	1.00	1000	60/90	7
FACTORY 5	0.80	1.07	1500	50	12
FACTORY 6	0.65	0.90	2500	60/65	18
FACTORY 7	0.92	1.15	2000	50/55	23
FACTORY 8	1.03	1.20	1800	70	15
FACTORY 9	0.70	0.95	2000	45/50	17
FACTORY 10	0.60	0.85	3000	55	30
FACTORY 11	1.05	1.25	2500	60	8
FACTORY 12	0.87	1.10	1200	50	21

Source: internal data

### 3.3 The packaging issue

In order to have a complete overview of the case study, it is important to include in the analysis also the packaging topic as it is a critical issue in terms of price: in fact, there are important differences between Italy and China. As we mentioned before, packing process is usually located outside the factory's production process in almost all the Italian factories in the industrial district of Castel Goffredo; this means that besides the cost of production, it is not possible to neglect the packaging cost and its allocation.

Regarding factory X, it has been stated that the packing process takes place in-house and so its price is involved in the total price that has been stated before: basic styles at 0.43€/pair and fashion styles at 0.79/pair packaging included. Anyway, in order to make a comparison with Italian factories and to have an alternative in the packaging allocation decision, it has been asked to a Chinese packing supplier a quotation of the socks packaging developed by factory X:

- Socks banderole 1 piece packaging → 0.031€ for 10.000 pieces
- Socks banderole 3 pieces packaging → 0.031€ for 10.000 pieces



However, it becomes an issue in case of reshoring to Italy, and the packaging price need to be taken into consideration. The most suitable solution would be to find a supplier that is located at least in Italy in order to benefit of the geographical proximity. Thus, I scouted a few factories that produce packaging that I have named as follow: packing 1 and packing 2.

Packing 1 is located close to Treviso and so just a few hours from the industrial district of Castel Goffredo. It is a very well-positioned factory in the market and the quality of its cartons is really high; obviously it follows that the quotation price is higher than factory X. Trademark sent them Chinese packaging in order to get a quotation of the same product with the same quality of factory X. The quotation has been made on 10.000 pieces and it includes also a decrease of price when quantities increase; even though for Trademark it is not very convenient, as 10.000 pieces cover almost all the quantities of its orders. The quotation made is as follow:

- socks banderole 1 piece packaging → 0.145€ for 10.000 pieces
- socks banderole 3 pieces packaging → 0.17€ for 10.000 pieces

For a quantity of 50.000 pieces the price of socks banderole 1 piece would be 0.073€/pcs and for socks banderole 3 pieces, the quotation is at 0.085€/pcs; while, for a quantity of 100.000 pcs, the prices would be: 0.063€/pcs (banderole 1 piece) and 0.075€/pcs (banderole 3 pieces). As mentioned before, the quantities are too high for Trademark in order to exploit economies of scales in the packaging, so these last two quotation are unlikely, and they cannot be taken into consideration for this case study.

Instead, packing 2 is located in the middle of Italy, but still the distance from the industrial district is manageable. It is also a very qualified packaging factory, that develop cartons with a good quality; however, given the Chinese samples, it has been asked the quotation for socks packaging with lower quality than factory X's, in order to verify if, adopting this strategy, it is possible to meet the target price, and which would be the result:

- socks banderole 1 piece packaging → 0.085€ for 10.000 pieces

- socks banderole 3 pieces packaging → 0.10€ for 10.000 pieces

Table 8: Chinese and Italian packaging comparison

DESIGN	SOCKS PACKAGING	MOQ	CHINESE SUPPLIER PRICE €	ITALIAN PACKING 1 PRICE €	ITALIAN PACKING 2 PRICE €
	BANDEROLE 1 SOCK	10.000 PIECES	0.031 €	0.145 €	0.085 €
	BANDEROLE 3 SOCKS	10.000 PIECES	0.031€	0.17€	0.10 €

Source: internal data

The table underlines the price differences between Chinese supplier and Italian ones. From Chinese side, the price is very convenient, and it does not influence the final price, it is a cost that might be considered insignificant. On the other hand, looking at Italian suppliers, the offer of packing 1 is way too high and it cannot be taken into consideration because there would be an important increase in the final price. While, in term of costs, packing 2 might be an option, but the quality is too low. As the packaging is an important component in the selling of a product as it contributes to the perception of the product, it has no sense to change the actual packaging of customer Beta for a worse version in order to keep this process in the proximity of the industrial district of Castel Goffredo.

Thus, in case of reshoring the production in Italy, the best strategy to adopt regarding the packaging is to still keep this process in China; even though, the lead time to deliver the packaging from China it would be higher and also the costs of transportation, it is still the best option to adopt: in fact, considering the same quantity of 10.000 pcs, the cost of Chinese supplier would be around 300€ plus the transportation costs, while the cost of Italian packing 1 would be from 1400€ to 1700€.

Obviously, Trademark would manage the coordination between the Italian factory and the Chinese supplier, in order to make the process smoother and to organize the timing table according to the deadlines.

## **CONCLUSIONS**

The intent of this case study is to compare the actual outsourcing of the socks' production process made by Trademark for the collections of its customer Beta (brand that is part of Alfa A/S company) and the potential reshoring to the Italian industrial district specialized in the production of socks and tights. Trademark already had the chance to work with Italian factories for another brand that explicitly asked to move the production to Italy for its tights collection, in order to have a better quality and the Made in Italy perception as an added value for its customers. Instead, in this case, the purpose is to analyze if there is a possibility of reshoring also for other brands that belong to Alfa A/S which did not made the request to move the production elsewhere. Thus, the purpose is to understand if there are other drivers offered by Castel Goffredo industrial district that might be valid reasons to reshore the production to Italy.

The study started with the analysis of the actual Chinese supplier, factory X located in the industrial district of Datang, which is well-known for the production of socks. It has immediately emerged that the price is very competitive both for basic socks and for fashion socks, as it happens almost all the times in the apparel industry; on the other side, the MOQ is quite high: 3000 pairs per size and per color. Obviously, the quantities of basic socks are higher than those of fashion socks, as the latter are different for each collection, while the former might be repeated styles also in the further collections; thus, this high MOQ, is suitable for basic socks in order, for Trademark, to exploit the economies of scale that can be created placing these orders. For fashion socks, instead the MOQ is too high, indeed Trademark has to struggle to place the orders and to negotiate with the supplier; it happens also that for little orders, factory X does not give any priority as it does not absorb the machines' costs.

In terms of capacity, factory X can offer high flexibility in managing the orders, while in terms of lead time, the supplier is quite weak as it takes about 90 days to deliver the goods and in the world of fast fashion it is a lot of time, also because it might be extended when problems arise along the bulk production.

Other aspects that need to be underlined regard the knowledge of factory X about the production of socks, in fact it is very specialized in the production of socks; even though, Trademark experiences some issues due to miscommunication with employees. In fact, Chinese workers do not speak English properly and this is a problem in the long-run; furthermore, Chinese employees are not precise in their work, so it often happens that the samples are not as expected causing delays and so Trademark buyers struggle to have a daily communication with the supplier in the attempt to coordinate and organize the production as well as possible. Obviously, the distance is a factor that impact the relationship, as buyers might lose control over coordination of the process.

On the other hand, looking at Italian factories described above, which are representative samples of the industrial district of Castel Goffredo, substantial differences emerge.

Starting from the most important difference, the price, Italy is not as competitive as China in the market; so, if the choice would be based just on this aspect, there would be no doubt that it is more advantageous to keep the production in China. However, there are also other factors that need to keep into consideration to make a choice of reshoring the production process; indeed, looking at the MOQ and lead time, they are favourable elements for Italian factories, as they are more suitable according to Trademark needs: lower MOQ and shorter lead time, which are strengths that Italian suppliers have and Trademark can take advantage especially for fashions socks orders.

Other factors that have emerged regard the high degree of technologies adopted by Italian suppliers in the district. In fact, they differentiate themselves in the market thanks to the latest generation of machines combined with the high level of traditional know-how and expertise they acquired by previous generations. The technologies used are not comparable to the Chinese ones: in fact, while in China some processes are still made with manual work, giving to Italian suppliers an advantage in terms of processes smoothness.

Furthermore, Italian factories tend to offer high quality products due to the careful choice of raw materials and the attention they have in the check of samples and to control the quality with advanced methods such as the AQL system and this makes the difference between Italian and Chinese products. In fact, looking at the physical samples, the difference of quality emerges and also the precision that Italian factories have, meaning that, besides having a better product, the production process might be faster as there is no waste of time to re-make samples if they are not as good as expected.

Furthermore, Italian employees are more willing to cultivate the relationship with Trademark and to make sure that the coordination and the organization of the process are as agreed before, meaning that they are willing to be flexible and solution-oriented in order to meet customer's standards; besides, most of Italian employees have a good knowledge of English, so the risk of misunderstanding decrease and, on the other side, Trademark would not have to struggle in the daily communication as Italian factories usually make sure to update its customer about the production process in order to avoid as many problems as possible, which is completely different from Chinese employees who tend to not take care of arising problems nor to communicate them to Trademark.

Based on these observations, it is possible to conclude that the factories in the Italian industrial district of Castel Goffredo might be considered as a valid alternative to reshore the socks production of customer Beta from China. Obviously, this decision is quite tricky, and part of this decision has to be taken also by customer Beta, as there would be an increase of prices.

According to the analysis of this case study, it is possible to affirm that the best strategy that can be adopted by Trademark is the following: as the basic socks have high volumes as there are repeated orders along the year for various collections, Trademark might keep the production in China at factory X, where it can exploit the economies of scale. Furthermore, according with the learning curve theory, as they have to develop basic socks, Chinese employees can acquire a high level of know-how and can specialized in the production of this kind of socks, making the process smoother, faster and with lesser problems across time, decreasing the risk of issues and delays of the bulk production.

On the other hand, the reshoring to Italian factories might happen for fashion socks, where the volumes are lower and so the MOQ offered by Italian suppliers is more suitable. With their precision and the understanding of fashion world, it is possible to develop fashion socks with high quality that reflects the perception of Made in Italy. It makes sense to reshore the production of fashion socks, as Italian factories might give the right attention and control that is needed in the production of these styles. They are willing to meet customer's requirements and they are solution-oriented, meaning that they work to find the best solution and alternative in order to develop a good product; furthermore, there is the tendency to not just work for Trademark, but also together with Trademark and grow with it in order to establish a strong and long-term relationship.

Instead, regarding the packaging, there are no chances to reshore it to Italy, as the prices are not competitive at all, nor the quality. In fact, as it has been highlighted before, in order to have the same quality as the existing packaging samples, the price is way too high. On the other hand, the samples developed with a lower quality do not look even similar to the original ones. Thus, the best solution is to develop it in China where it is possible to have a high-quality packaging with a very competitive price, which saving is still more convenient when compared with the transportation costs from China.

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