

School of Industrial and Information Engineering
Master of Science in Management Engineering



POLITECNICO
MILANO 1863

*The reshoring of manufacturing activities: moving towards a new
country or coming back home? An industrial perspective*

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Academic Year 2018/19

Session II

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List of acronyms

EU: European Union

FDI: foreign direct investment

FIR: Fourth Industrial Revolution

IB: International Business

MNE: Multinational Enterprise

ORoSD: Other Relocations of Second Degree

RBV: Resource Based View

RHC: Return to the Home Country

RSD: Relocations of Second Degree

RTC: Relocations to a Third Country

TCE: Transaction Cost Economics

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Abstract Italian Version

Dopo anni in cui l'*offshoring* è stato al centro delle strategie aziendali, oggi le aziende manifatturiere cominciano ad andare oltre, cercando di trarre vantaggio dai benefici dalle rilocalizzazioni di secondo livello, ossia dagli ulteriori spostamenti di attività precedentemente delocalizzate. La rilocalizzazione di secondo livello, chiamata anche *reshoring*, può dividersi in due gruppi: rilocalizzazioni nel paese d'origine (RHC), quando cioè un'azienda decide di rimpatriare le attività produttive nel proprio paese, oppure rilocalizzazioni in un terzo paese (RTC), quando un'azienda decide di muovere la produzione in un nuovo e differente Paese.

Nello specifico, l'obiettivo di questa tesi è valutare qual è la relazione tra rilocalizzazioni di secondo livello e le caratteristiche dei settori in cui le aziende operano, con il fine ultimo di comprendere se queste possano influenzare la scelta finale di una nuova rilocalizzazione. Per sviluppare l'analisi abbiamo usato dati provenienti dall'European Restructuring Monitor e dall'European Reshoring Monitor, e abbiamo costruito tre indicatori (propensione all'*outsourcing*, intensità di capitale e intensità tecnologica) riguardanti altrettanti aspetti settoriali.

I risultati mostrano una rilevante e significativa influenza delle caratteristiche settoriali nella scelta del tipo di RSD. In particolare, emerge che in settori caratterizzati da propensione all'*outsourcing* o definiti capital intensive le aziende tendono a preferire RHC, invece che RTC. Le evidenze empiriche mostrano e confermano le ipotesi avanzate su base teorica. I risultati complementano i precedenti studi, facendo emergere la necessità di un dibattito su come le caratteristiche settoriali possano alterare le decisioni di localizzazione.

Parole chiave: Reshoring; Rilocalizzazioni di secondo livello; Offshoring; Industria; Settore manifatturiero; Propensione all'*outsourcing*; Intensità di capitale; Intensità tecnologica

Abstract English Version

After years in which offshoring has been at the core of corporate strategies, manufacturing companies are now beginning to go further, seeking to take advantage of the benefits of second-tier relocations, i.e. further relocations of previously relocated businesses. Relocations of second degree, also called reshoring, can be divided into two groups: relocations to the country of origin (RHC), when a company decides to relocate its production activities to its home country, or relocations to a third country (RTC), when a company decides to move its production to a new and different country.

Specifically, the aim of this thesis is to assess what is the relationship between relocations of second degree and the characteristics of the industry in which companies operate, with the ultimate aim of understanding whether these can influence the final choice of a new relocation. To develop the analysis, we used data from the European Restructuring Monitor and from the European Reshoring Monitor, and we built three indicators (outsourcing propensity, capital intensity and technological intensity) covering as many sectoral aspects.

The results show a significant influence of the industrial characteristics in the choice of the type of RSD. In particular, it emerges that in sectors characterized by propensity to outsourcing or defined as capital intensive, companies tend to prefer RHC instead of RTC. The empirical evidence shows and confirms the hypotheses put forward on a theoretical basis. The results fit in and try to fill the gap left by previous studies, bringing out the need for a debate on how sectoral characteristics can alter localization decisions.

Keywords: Reshoring; Relocations of second degree; Offshoring; Industry; Manufacturing; Outsourcing Propensity; Capital Intensity; Technological Intensity

Introduction

To increase worldwide competition, firms have started to implement internationalisation strategies. Offshoring and outsourcing continue to attract significant interest of both managers and scholars. However, in the last decades, the reshoring phenomenon started to gain *a momentum*: firms began to move production activities that were previously offshored abroad, either in the home country (relocation to home country – RHC) or in a new one (relocation to third country – RTC), in order to maintain or to foster their competitive advantage.

Many studies have posed the attention on the relocations of second degree, firstly defining the boundaries of the phenomenon, and then understanding what the relative reasons and implications. Several scholars posed the attention of reshoring at a macro-level, analysing the differences between the home and the host country and underlying the drivers (or locations advantages) behind the second step of the offshoring strategy. Other authors tried to investigate at a micro-level the interactions between the single firm characteristics and the reshoring trend.

The current literature has shown an important gap in relation to industrial characteristics. More specifically, the decision to transfer part or the entire production depends also by the industrial context in which the firm is posed. In this perspective we try to investigate whether the industry or sector to which the enterprises belong can play a role in the relocations of second degree, introducing a meso-level dimension in the study of reshoring.

Therefore, our research question is: *Does industry characteristics affect the probability to undertake an RHC rather than an RTC?*

More specifically, we try to understand the behaviour of firms belonging to outsourcing propensity, capital intensive and technological intensive industries using data from the European Restructuring Monitor (ERM) and from the European Reshoring Monitor. The results point out that a company characterized by a high outsourcing propensity or by high capital intensity, have the tendency to relocate the production activities in the home country, rather than implement an RTC.

The structure of the thesis is the following: in chapter 1 we provide a literature review on the phenomenon, distinguishing between offshoring and reshoring and defining the relative motivations. In the second chapter we focus on the main trends in the research of reshoring, while in the last paragraphs, we describe the hypothesis we want to test in our dissertation. Then, in chapter 3, a descriptive statistics analysis, using a dataset regarding 589 observations involving 345 different firms, is performed. Furthermore in the fourth chapter are presented the results of the Probit econometric model, with the aim of understanding whether the three industrial characteristics have an influence on relocations of second degree. Finally, in the last chapter, we discuss the results of the econometric analysis, giving insights for policy makers and for future developments.

CHAPTER I

Offshoring and reshoring: theoretical background

The current economic scenario is characterized by discontinuity and dispersion in the presence of skills, end-markets, resources, technologies and capital, distributed in various geographical locations around the world. Thanks to the unifying elements of globalization, enabling factors for internationalization, companies can freely choose the configuration of their own value chain, placing each activity, ideally, in the geographical areas where are accumulated all those elements that can potentially be exploitable for the pursuit of competitive advantage.

Historically, location decisions fall within the broader concept of corporate strategy and are taken based and coherently with it. In recent decades, particularly since the 1990s, the dominant paradigm for companies has been to establish production strategies based on the cost advantages that can be derived from the geographical relocation of their activities, with a focus on the manufacturing and the productive ones. What has been recorded over time, therefore, has been a massive recourse to practices such as offshoring and outsourcing, in particular of activities with lower value added (Ricciardi *et al.*, 2016).

The reasons behind these strategic choices were mainly related to the search for lower costs or greater flexibility in carrying out production activity (Gray *et al.*, 2013). This implies, also, that the main host countries of these investments have been “developing countries”, which offer highly flexible and low-cost labour markets. In other words, companies look for advantages in terms of cost, especially with reference

to manufacturing factors such as work and energy, but also lower rates of tax and duties on import and export (Gray *et al.*, 2013).

The phenomenon of offshoring is not recent, but it is only after the Second World War that it takes on significant dimensions. These were years in which the big American multinationals, in order to guarantee a direct control of their target end-markets and at the same time to reduce costs, started a massive process of relocation. Until then, the relocation involved exclusively the so-called labour-intensive activities, that are labour-intensive production activities, and was motivated mainly by cost reduction logics. But in the '80s the phenomenon took a different pattern, due to, above all, the progress of modern information and communication technologies, a true binder in the modern global supply chain. Therefore, it became possible to relocate even more complex and less standardized activities. The beginning offshoring of service activities is dated 1979, the year in which American Express delocalized the process of customer account and relationship management in India (Sako, 2014). Later on, a new wave of offshoring procedures, intensified in the 1990s, was developed, with a focus, no longer only on manufacturing activities, but also on services. Above all professional services, technical and administrative practices. All activities that, before the changes brought by globalization and technological development, could not be offshored. Today, even high value-added activities, such as IT and data management, are offshored (Sako, 2014).

1.1 – Offshoring theory

Before starting the literature review, it is important to emphasize that this dissertation will be primarily on the phenomenon of relocations of activities performed by manufacturing firms. This insight, and the specific intention of not inspecting the implications for services, depends on different reasons.

First, the barriers for service relocations are a much lower constraint and the nature of nowadays service activities makes them more blurred than the ones experienced by manufacturing firms (Fratocchi *et al.* 2013). Secondly the delocalization of services involves a lower number of countries, respect to

manufacturing (Fratocchi *et al.*, 2013). Third, as Alajääskö (2009) argued manufacturing firms adopted international sourcing to a far larger extent than enterprises active in other sectors (often three-four times more). Finally, several western states, after years of delocalization, are encouraging the repatriation of manufacturing activities back from low income countries, with incentives and policies aimed at increasing productivity levels in the home country (Albertoni *et al.*, 2015).

At this point it is necessary to identify what are the theoretical definitions of the aforementioned phenomenon.

The phenomenon of offshoring is defined as “*the cross-border (re)location to distant locations of value activities that were once performed within the firm’s country of origin, and aims to serve global rather than local demand*” (Fratocchi *et al.*, 2013). Consistently, this first definition can be expanded by enlarging the analysis spectrum. Therefore, we use the definition provided by Sako (2005): “*Offshoring happens when private firms or governments decide to import goods or services from overseas that they had previously obtained domestically. It is therefore about sourcing decisions which involve (a) imports, (b) displacement of domestic production and associated jobs, and (c) foreign direct investment (FDI) outflows if sourcing happens from overseas affiliates*”.

Thus, according to this definition the offshoring phenomenon is the practice of procurement of business functions abroad, including outsourcing and imports. Indeed, even if in practice the terms offshoring and outsourcing are used interchangeably, they describe two different phenomena. The outsourcing conventionally refers to the practice of a company hiring another one to perform tasks before executed in-house (Bednarzik, 2005). Instead, the offshoring, coherently with the previous definition, is the process of sourcing any business function supporting domestic or global operation from abroad, in particular from low-cost emerging economies, either through a wholly owned subsidiary (*captive offshoring*) or a third-part provider (*offshore outsourcing*) (Manning *et al.* 2008). Thus, the offshoring is, by extension, the practice of procurement abroad of business functions. This is regardless of whether the activity being relocated is carried out directly by the company (*captive offshoring* or

national/international relocation) or that is entrusted to a specialized foreign supplier (*national/offshore outsourcing*) (Lewin *et al.*, 2008; Kinkel & Maloca, 2007).

We can state that from a contractual point of view, two subjects are therefore involved in an offshoring relationship: the client, or *offshorer*, which is the company that requests the supply; and the vendor, or *offshoree*, which is the supplier. In the case of captive or “make” offshoring the subjects are the same, so the *offshorer* and the *offshoree* coincide (Wolter *et al.*, 2005). *Captive offshoring* and *offshore outsourcing* are therefore conceptually distinct but, as strategic decisions, they need to be analysed simultaneously. To better understand what we have just said, we can refer to the matrix below.

		<i>Ownership dimension of manufacturing transfer</i>	
		Make	Buy
<i>Spatial dimension of manufacturing transfer</i>	National	National Relocation	National (Domestic) Outsourcing
	International	International Relocation = Captive Offshoring	Offshore (International) Outsourcing

Table 1 - Four different types of manufacturing transfer. (Lewin et al., 2008; Kinkel & Maloca, 2007).

As shown by the matrix in table 1, the axes indicate the spatial dimension of manufacturing transfer, so the boundaries within to carry out the activity, and the *make or buy dilemma*. The first represents the dimension of control, and the location choices about where to do it. What it is present in the quadrants are four possible strategic alternatives and offshoring methods that can be used by the company.

Leaving aside the cases in which the activity remains localized in the country of origin of the parent company, regardless of whether it is carried out internally by the company (*National relocation*) or by an external supplier (*Domestic outsourcing*), the focus should be on the strategic alternatives represented in the lower quadrant, and so on the international dimension of manufacturing transfer.

- *Captive Offshoring*. In this case the activity is carried out within the company boundaries, in particular by a foreign branch or subsidiaries. In this case, the performance of the activity remains under the direct, legal and managerial control of the parent company (Bednarzik, 2005).

- *Offshore Outsourcing*. Represents the situation in which the company turns to a foreign supplier. The object of the offshoring contract can be a specific function, exercised permanently by the supplier (*Selective Outsourcing*) or temporarily transferred (*Transactional Outsourcing*), or of an entire process (*Total Outsourcing*). The control exercisable by the offshorer is low, with the consequent risk of loss of control over the quality and the expropriation of technologies and IP rights (Bednarzik, 2005).

Obviously, the advantages that are sought through relocation, and the strategic objectives that are intended to be achieved, will be factors that affect the choice of which of these offshoring methods to undertake. In general, we can state that when the activity to be performed requires specialized resources and specific skills, or when it requires the use of protected proprietary technologies, the decision will tend to favour greater internal control and, therefore, tend to opt for *captive offshoring* (Aykol et al., 2013; Mihalache and Mihalache, 2016; Quintens et al., 2006; Schmeisser, 2013). The flip side is the risk of running into problems of organizational rigidity, lack of strategic flexibility, costs for the control of internal operations, problems and consequent costs, which increase with the spreading of the organizational and geographical boundaries of the company (Quelin & Duhamel, 2003).

When these costs take on a significant dimension, as well as in cases where the company does not possess the necessary knowledge and skills, then it will opt for the outsourcing of the activity, and therefore for an *offshore outsourcing* strategy (Fratocchi et al., 2014). The loss of direct control over the performance of the activity can, in these cases, be remedied by establishing strategic alliances and binding in medium-long term stable relationships with partners and suppliers (Pfannenstein & Tsai, 2004).

To have a more precise view of the classification of the phenomenon we can identify, in relation to the distance of the geographical location of the activities, two sub-categories in the first step of the delocalization of production activities, such as *near-shoring* and *off-shoring*. The geographical distance of the country obviously has repercussions on those that are the costs of the delocalization and the difficulties in the coordination of the activity (Di Mauro et al., 2018). As regards the phenomenon of

off-shoring, this concerns the delocalization towards geographically more distant countries. For this reason, it requires greater efforts and the use of more substantial resources to control the operations of the branches or the supplier and the coordination of the activities carried out (Fratocchi *et al.*, 2014). *Near-shoring*, on the other hand, reminds for delocalization in a geographically close country. In this case, the costs of relocation tend to be lower and the coordination of activities with the parent company is facilitated (Fratocchi *et al.*, 2014). Given the geographical proximity, moreover, the company can capture advantages that arise from a shorter distance, not only geographic, with consequent benefits in terms of logistics, but also cultural, linguistic and temporal (time zone). This facilitates communication and coordination of activities (Carmel & Abbott, 2007). An example of such operations could be represented by an Italian firm that relocates its production activity in an eastern European country.

1.1.1 - Motivations and drivers for Offshoring

Obviously the decisions of offshoring and, consequently, those concerning the country where to go, depend not only on the specific characteristics of the different territories, but also, in a broader sense, of the corporate strategy, and so on the characteristics of the company and the objectives that, through delocalization, companies intend to pursue (Canham & Hamilton, 2013). Literature on foreign direct investments has always investigated the motivation behind international relocation and expansion. The motivations can be traced back to three macro categories such as: competitive opportunities that the territorial conditions offer, the competitive structure of the sector in which the company operates and a more firm-specific factors and characteristics (Kedia & Mukherjee, 2009).

Proceeding in order, first of all, it is necessary to highlight the underlying economic theory. The *Transaction Cost Economics* (TCE) theory suggests that firms move their activities from one country to another in search of a reduction of costs (Ellram, 2013). In particular, TCE concentrate on the *make-or-buy dilemma*, and so on the balance between the cost of market transactions and the specific asset investments. Thus, coherently, between the possible risks related the buying and/or the making.

The *Internalization theory*, based on the work of Coase (1937), instead, states that the manufacturing location decision are driven by global and macro level. The decision is, according this view, dependent by cost and risk-related factors between home and host countries (Casson, 2013).

But, the most considerable and substantial contribution to the literature is constitute by the *Dunning Eclectic Theory* (1980, 1988, 1998). This theory exerts a dominant influence on the international business (IB) theory, giving important insights to FDI. The author identifies three determinants for the international development of multinational enterprise: *ownership advantages*, *location advantages*, and *internalization advantages*. The *ownership* and *internalization advantages* are related to a firm-level analysis, they refer, respectively, to the ability of the target firm to exploit the advantages related to their intangibles asset as patents, technologies, reputation, knowledge and to the ability of the target firm to execute transactions within their organization, rather than relying on an outside market.

The so-called *location advantages* depend, instead, from country-specific features and characteristics. The categories of *location advantage* comprise:

- the influence of national resources, confined only in specific region or country (*resource-based advantages*);
- the lower cost of material and labour. As well as, government trade policies (*import-substituting manufacturing advantages*);
- the possibility to establish a better access to the market, through a close proximity to the final targeted customers (*trade and distribution advantages*);
- generic and specific incentives, given by host-country government, that push for a local production.

Subsequently, in 1998 Dunning proposed a new eclectic theory that recombined and replaced the latter four factors in the following (Dunning, 1998; Ellram 2013; Franco *et al.*, 2008): (a) *market seeking advantage*, (b) *efficiency seeking advantage*, (c) *resource seeking advantage* and (d) *strategic asset seeking advantage*.

Market seeking advantage refers to the behaviour of firms that, after having penetrated the home market and have reached the saturation level, starts to invest in new markets through FDI (Dunning, 1998). The principal aim is to increase profits and sales. Companies may also invest in specific country, with the goal to create synergies. Indeed, foreign investments can also be "demand oriented". So, the relocations of production, distribution and, sometimes, marketing are done to have a better control of the foreign market (Franco *et al.*, 2008). Finally, important reason for companies, that push forward a direct foreign investment, are the possibility to overcome import tariff and the reduction of logistics costs (Ellram *et al.*, 2013). In addition, critical factor is represented also from the need for physical proximity to customers, to better understand their tastes and needs and provide a more satisfactory after-sales assistance (Manning, 2014).

Efficiency seeking advantage refers, instead, to the intention of exploit specific location advantages, with the goal of design a production network that improve the output or reduce the cost. Indeed, companies can search for activities that either exploits differences in factor costs (*labour cost reduction*) or enhances economies of scale and/or scope, (*productivity enhancing*), bundling production (Barbieri *et al.*, 2019). Cost reduction is the reason why most destination countries are "developing" countries. Investments, motivated by the search for a greater efficiency, are driven by the desire to take advantage of differences in availability and, above all, in the cost of production factors in different places (Manning, 2014). However, to remain part of such global network of highly interconnected competences and relationships is economically advantageous and sustainable only if the coordination costs of the network remain lower than the savings obtained from the relocation and the globally discontinuous distribution of activities (Chakrabarti & Mitchell, 2013). It should be noted that more specialized outsourced activity requires more specialized labour, and so greater results the difference in the salary between home and host country (Stentoft *et al.*, 2018). The exploitation of this cost spread is defined in the literature as global labour arbitrage (Stentoft *et al.*, 2018).

Resource seeking advantage refers to the fact that FDI can be motivated also by the willingness of multinational enterprises to gain access to relevant resources, that are not present in the home country or at lower cost respect to the home country

(Franco *et al.*, 2008). In order to distinguish it from the case of intangible resources such as knowledge, information and skills, the term resource is used here as referred to material productive inputs and natural resources. In this sense, the reason may be the access to tangible physical resources that are too expensive or not present in the country of origin, which makes it necessary for companies to access them abroad (Ellram *et al.*, 2013).

Strategic asset seeking advantage, finally, refers to the companies desired to acquire synergies, skills and knowledge related assets not marketable (e.g. know how, expertise) (Ellram *et al.*, 2013). That means that another reason that can push companies to delocalize some of their activities is the search of new resources that allow them to update their pool of skills and competences (Oxley & Wada, 2009). Thus, the chosen locations will be those in which there are sources of possible new capabilities and skills. These are generally country where high-technological activities are carried out, in which there is a specialized and highly qualified labour force or in which there is a high intensity of technology development (Ellram, 2013). Since it is tacit knowledge and, therefore for definition difficult to codify and transmit, geographical proximity is essential to gain access to it, and so to acquire it. These are phenomena that relate to the formation of clusters and districts of knowledge and skills. Examples of this are Ireland for the IT sector or Taiwan for microelectronics. In other cases, the companies have the resources and skills necessary to carry out the activity, but the offshoring can be motivated by the search for an improvement in the quality of the output (Ellram *et al.*, 2013). This motivation concerns above all those activities that require specialized skills and know-how, of which the company is not in possession and which it deems it would be inconvenient to develop internally (Lewin *et al.*, 2009). To be highlighted is the company tendency to internalize knowledge and innovation through “*reverse technology transfer*”. Basically, when a firm acquired and developed intangible assets, these are then transferred back to the parent company and the FDI is dismissed (Mansfield, 1984).

In order to provide the widest possible vision, two additional factors can be added to these four categories: *country-specific factor* and *competitor behaviour* (Caroli 2012).

For *country-specific* factor are intended all macro-economic, social, political and cultural characteristic. It is referred, among other things, to the tax system, to duties on imports and exports, as well as the rate of inflation, political stability, bureaucratic simplification (Messini & Lewin, 2008). A further critical element for the decision could be the expected percentage changes in exchange rates (Messini & Lewin, 2008). The appreciation of a currency can transform a low-cost location into a less convenient one. A case that deserves to be mentioned is represented by the fluctuation of the Yen during the end of 1990s and the beginning of 2000. After a long period of time, between 1950 and 1980, in which the relative low value of the Yen had consolidated Japan as a destination for offshoring operations, the subsequent and constant appreciation of the currency against the dollar has effectively cancelled the previous benefits, making it in conclusion less attractive as a potential production site.

To summarize and make order in all the drivers aforementioned, Fratocchi *et al.* (2013) have developed a classification based on three macro-categories: (a) *resource/efficiency/market/asset seeking goals*, so the strategic mission of the firms; (b) *environmental factors*, the firm's embeddedness in its ecosystem, which in turn can hide potential external inertia and/or drivers for the formulation of off-shoring strategies (e.g. home/host country laws, such as those referring to IP rights); (c) *organization-specific factors*, such as the firm's accumulated international knowledge.

1.2 – Reshoring theory

In the recent years several firms announced the repatriation or the further relocation of (part or full) of their earlier offshored production. GE in US announced few years ago a \$1 billion investment to “reshore” the manufacturing of appliances from factories in China back to plants in the United States (Crooks, 2012; Gray, 2013). The American giant was not the only one, in fact after decades of relocations of production to Asia also some European companies are pursuing the example of their U.S. competitors, coming back home, as Bosch and Philips (Wan *et al.*, 2019), and the phenomenon does not include only big firms but also small and medium enterprises (SMEs). Reshoring is not a new phenomenon, since it is documented since the eighties (Mouhoud, 2007); but lately, it has gained momentum since these cases are increasing

and have been continuously reported in consulting firm's reports (Pwc, 2015) and in the economic press (The Economist, 2013; 2017; Forbes, 2014).

Given the novelty, the logic consequence is that this phenomenon was framed within broader phenomenological categories, which are however only partially associated with it, and which differ in some of its peculiarities and specificities. Coherently a review of the past literature is shown, and it offers confirmation to the fact that a firm's offshoring decision must not be considered only as a non-reversible process (Kinkel *et al.*, 2007).

Several alternative concepts of this phenomenon can be found in the relevant literature. Traditionally, scholars adopted different terms to refer to these operations. Among the others, the most used terms are "*international divestment*" (Boddewyn & Torneden, 1973), "*de-internationalization*" (Benito and Welch, 1997), "*back-reshoring*" (Kinkel & Maloca, 2009) and "*re-shoring*" (Ellram *et al.*, 2013). In the extant academic contributions, all the cited terms have their own definition; however, each of them lacks in covering one or more aspects of the analysed events.

First, the concept of *international divestment* (Boddewyn & Torneden 1973) encompasses the concepts of the closure of a foreign plant and the subsidiary as a whole, not expressing explicitly the relocation to the home country, the voluntariness of the decision and the difference between in- or out-sourcing (Fratocchi et al. 2014). The second definition, given by Benito and Welch (1997), states that the *de-internationalization* phenomenon consists in a reduction of the engagement in cross-border activities by a company, but not considering the relocation to the home country; furthermore, this definition neglects the possible differences in in-sourcing or out-sourcing of the activities (Fratocchi et al. 2014). A third definition refers to the term *back-reshoring* and was proposed by Kinkel and Maloca (2009, p. 155); the authors define the adopted terminology as a "*re-concentration of part of production from own foreign locations as well as from foreign suppliers to the domestic production site of the company*". This regards the in- and out-sourced manufacturing activity abroad, whether it is partial of total, but – as the previous three definitions do – it does not express the voluntariness of the decision. Finally, the definition of *re-shoring* –

proposed by Ellram, Tate, and Petersen (2013) – lacks in defining if the transferred activity is in-sourced or out-sourced.

As emerged, the literature adopted different definitions, in order to indicate the further movement or the repatriation of the previously offshored activities. The two most common concepts are *back-reshoring* and *reshoring* and, thus we decided to focus the attention in the dissertation on them.

A general *reshoring* strategy concerned with where manufacturing activities are performed, independently of who is performing the manufacturing activities in question (Gray *et al.*, 2013). All the possible options are represented by the matrix in the *Table 2*.

		<i>To: Reshore</i>	
		In-House	Outsourced
<i>From: Offshore</i>	In-House	In-House Reshoring	Reshoring for Outsourcing
	Outsourced	Reshoring for insourcing	Outsourced Reshoring

Table 2 - Four types of reshoring transfer. (Gray et al., 2013)

Table 2 allows to identify four possible patterns of reshoring that enterprises can undertake: (a) *in-house reshoring*, a firm fulfils demand in its local market by relocating manufacturing activities in wholly owned offshore facilities back to wholly owned home-based facilities; (b) *reshoring for outsourcing*, a firm fulfils demand in its local market by relocating manufacturing activities in wholly owned offshore facilities back to home-based suppliers; (c) *reshoring for insourcing*, a firm fulfils demand in its local market by relocating manufacturing activities to offshore suppliers back to wholly owned home-based facilities; and (d) *outsourced reshoring*, a firm fulfils demand in its local market by relocating manufacturing activities to offshore suppliers back to home-based suppliers.

Finally, it is important to highlight that the *international location decision* is a multi-step process of a dynamic nature, in which the decisions on the geographical location changes in relation to the environment (*comparative advantage*) and the competitive choices of the company.

Step	Location	Definition	Example
<i>Step 1: first delocalization of production activities</i>	A foreign country close to the home region	Near-shoring	An Italian firm locates production in Czech Republic
	A foreign country far away from the home region	Offshoring	An Italian firm locates production in China
<i>Step 2: second delocalization of production activities</i>	A foreign country close to the home region	Near-reshoring	An Italian firm relocate production to Austria after had offshore it to Mexico
	A foreign country far away from the home region	Further offshoring	An Italian firm relocate production to Japan after had offshore it to Mexico
	The firm's home country	Back-reshoring	An Italian firm move back production to Italy after had offshore it to Poland

Table 3 - Multi-step process for the internationalization of the production (Fratocchi et al., 2014)

This multi-step process has been represented in the *Table 3*. In the first instance, the company will decide whether or not to internationalize its production activity. At the same time, if it opts for internationalization, the choice involves the decision of the relative governance structure (*in-sourcing* or *out-sourcing*) and of the geographical distance from the home country. With regards to the location, the geographical distance, that divides the country in which the parent company is based and the one in which the activity will be delocalized, will lead to the configuration of a *near-shore* situation, in the event that the countries are geographically close, or *offshoring*, if, contrarily, they are distant.

Taking the initial offshoring decision, there are three cases that could later occur:

- the plants are transferred (partially or fully) to a country near the initial one (*near-reshoring*);
- the production (partial or full) is moved in a new country far away from the first host country (*further offshoring*);
- the company decide to repatriate at home the production (*back-reshoring*).

This latter configuration, the *back-reshoring*, can be defined as a “(..) *voluntary corporate strategy regarding the home-country's partial or total relocation of (in-sourced or out-sourced) production to serve the local, regional or global demands*”

(Fratocchi *et al.*, 2014). This description has the advantage of bringing to light the intentional and deliberate nature, its potential coexistence with offshoring strategies and the identification of repatriation in the country of origin as a fundamental characteristic, regardless of whether the activity was initially carried out directly by the company or outsourced to third parties. Back-reshoring necessary origin from a previous offshoring strategy, which became a *de facto* assumption. “*For back-reshoring to occur, a choice to pursue offshore must have been made in the past*” (Gray *et al.*, 2013). This is a peculiarity that makes back-reshoring decisions different from all the other strategic location choices, and it imposes to consider the phenomenon not in an isolated manner, but always in relation to its theoretical antecedent and practical presupposition. Finally, it is highlighted how the definition refers explicitly to the manufacturing nature of the relocated activity.

It should be noted that this dynamic process is not necessarily of an incremental or sequential nature, since the back-reshoring is characterized precisely by a revision, at least partially, of the previously implemented localization choices (Ellram *et al.*, 2013).

1.2.1 – Terminology

To simplify and to make the whole dissertation terminology consistent and coherent, we will use the conceptualization proposed by Barbieri *et al.* (2019), helpful to conduct a precise analysis into the different trends of relocations. In general, a *reshoring* initiative is defined as a *relocation of second degree* (RSD), also to stress and to highlight the fact that it necessarily comes after a first offshoring operation.

The RSD is divided consequently (as shown in figure 1 and in figure 2, into two sub-categories, depending on the geographical position of the relocated activity: (a) a *relocation to home country* (RHC), when, after the initial delocalization from country A (i.e. the *home country*) to country B (i.e. the *first host country*), the firm moves the production activity back to country A; (b) a *relocation to third country* (RTC), when, the firm moves the relocated activity from the country B to a country C (i.e. the *second host country*), different to country A.

From now on, and throughout this dissertation, we will mainly refer to a reshoring decision involving the movement back to the home country as “RHC” and to a reshoring decision involving the movement to a third country as “RTC” keeping the notation proposed by Barbieri et al. (2019).

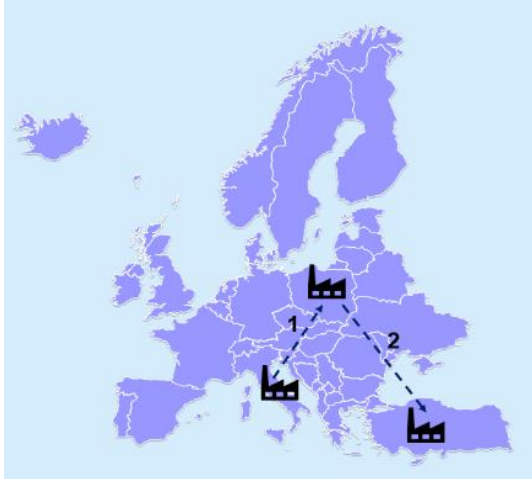


Figure 1 - Example of Relocation to a Third Country (RTC) in Europe

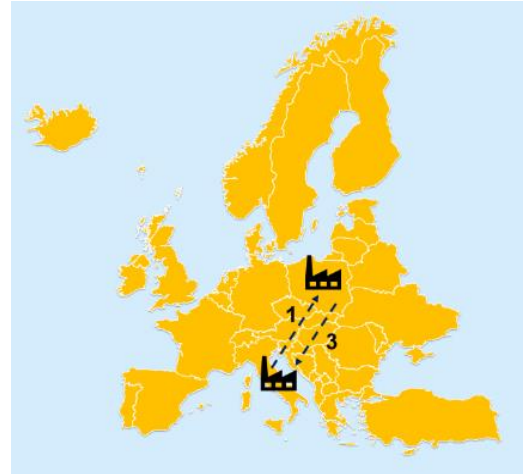


Figure 2 - Example of Relocation to the Home Country (RHC) in Europe

1.2.2 – Motivations and drivers for Reshoring

After having drawn the conceptualization and the main terminology regarding reshoring, we move to a discussion about the motivations and the drivers of RSD.

One of the first reason behind reshoring choices was identified in the wrong managerial assessment when the offshoring decision was taken. This concept is known in literature as *managerial error* (Di Mauro *et al.*, 2018). The term *managerial error* refers to a wrong initial evaluation of the potentially achievable advantages that a new geographical location for the production facility of a firm would provide. The company boards were accused, in particular, of having underestimated some of the costs generating from the relocations of business activities, but not directly related to the production process. A circumstance that would have led to the failure to realize the desired benefits (Stringfellow *et al.*, 2007). From this point of view, back-reshoring would be nothing other than a corrective mechanism for incorrect managerial evaluations (Kinkel & Maloca, 2009).

Moreover, according to Kinkel and Maloca (2009), it is possible to observe the phenomenon as an imbalance between expected cost and benefit and actual cost and benefit. In some cases, the cost and benefit evaluation are defined *flawed* (Gray *et al.*, 2013). In this trend are counted behaviours as the *bandwagon effect*, theorized by Abrahamson and Rasenkopf (1993) or the presence of *hidden cost* (Gray *et al.*, 2013). The first term, the *bandwagon effect*, refers to the imitation of the conduct of competitors, and so of other managers, as a principal driver for the enhancement of the first offshoring decision (Mariotti *et al.*, 2008). The latter, *hidden cost*, refers to a possible reason of an overestimation or underestimation of the cost that the company has to bare after the reshoring (Gray *et al.*, 2013). Basically, the RSD, and in particular the RHC, decisions can be considered as a reaction to some unmet expectation that the company had at the time of the first relocation (Albertoni *et al.*, 2015).

Obviously wrong managerial choices cannot be considered the only drivers. Indeed, complicit in these choices of repatriation of productive activity was also the gradual change in the geopolitical environment, which eroded the advantages offered by the relocation in certain geographical areas (Kinkel & Zanker, 2013). The balance between the advantages offered by production in developing and developed countries is changing. Change of contexts, however, not only of the countries in which the productive activity has been displaced, but also of the home country, typically western nations, that, through policies and initiatives, have tried to convey and favour the phenomenon of back-reshoring (Bunyaratavej *et al.*, 2012). This driver, also labelled *changes in the business context* (Albertoni *et al.*, 2015; Vestering, 2005) stress the role of a change in the business environment, due to political instability, regulatory regimes, weak transport infrastructure, intense economic downturn and a rise in the labour cost (Vestring, 2005).

Finally, another possible driver is, the so-called, *strong interconnections along the value chain* (Albertoni *et al.*, 2015). It is referred that the co-location of innovative and productive activities may foster innovation. In this case, companies may re-shore manufacturing activities to benefits from the interconnections (Albertoni *et al.*, 2015).

But also, these explanations do not saturate all the possible reasons highlighted by the extent literature. It is, therefore, necessary to go deeper into the analysis about

the factors that could have led to an offshoring and then to an RSD decision, both RHC and RTC. The first element that academics consider as a fundamental determinant is the *cost differential* (Dachs *et al.*, 2006). It means, that it is the possible existence of a gap between expected and actual cost, to determine the decision of re-shore. This factor is supported by the fact that reduction of production cost is one of the main reasons for an initial relocations (i.e. *efficiency seeking advantage*, (Dunning, 1998; Ellram 2013; Franco *et al.*, 2008). The German Manufacturing Survey, highlights as the *cost reduction* has a bigger importance for the firm responding. However, it is rightful to stress that, as Fratocchi *et al.* (2016) states, there is a strong disconnection among reasons for the first offshoring and the RSD. Other drivers, highlighted by the literature as critical factors in RSD decisions, are quality of production, proximity to customers, coordination costs, quality of infrastructure and qualified personnel (Kinkel & Maloca, 2009).

It is possible to add the driver of *labour cost*. This matter is broadly discussed, keeping the implications and the external factor, such as the 2008 economic crisis. Empirical data shows that RSDs kept constant in percentage during the crisis period (Kinkel 2012). Moreover, Kinkel states, also, that, during the crisis period, no evidence is showed backing the idea of an increasing importance of the labour cost in the decision for a relocation of second degree. The same author explains RSD, and in particular RHC, operations as an attempt to concentrate “*production capacities, trying to exploit the benefits of higher capacity utilization and a superior relation of variable costs to fix at their existing locations*” (Kinkel, 2012, p. 155).

1.2.3 – Motivation and drivers for back-reshoring

Shifting the perspective, many authors tried to summarize and organize the determinant for RHC. Five significant categories for *back-reshoring* can be defined: *labour costs, logistic costs, host country characteristics, home country related features, firm specific factors*.

The *labour cost*, and in particular the progressive shrinking of the imbalance between country A and B labour cost, had played the most important role in the decision for a large number of firms according to the Uni-CLUB MoRE research

(Fratocchi *et al.*, 2014). To give an idea, in *Figure 3*, is shown the comparison between the average yearly manufacturing wages for USA and China workers.

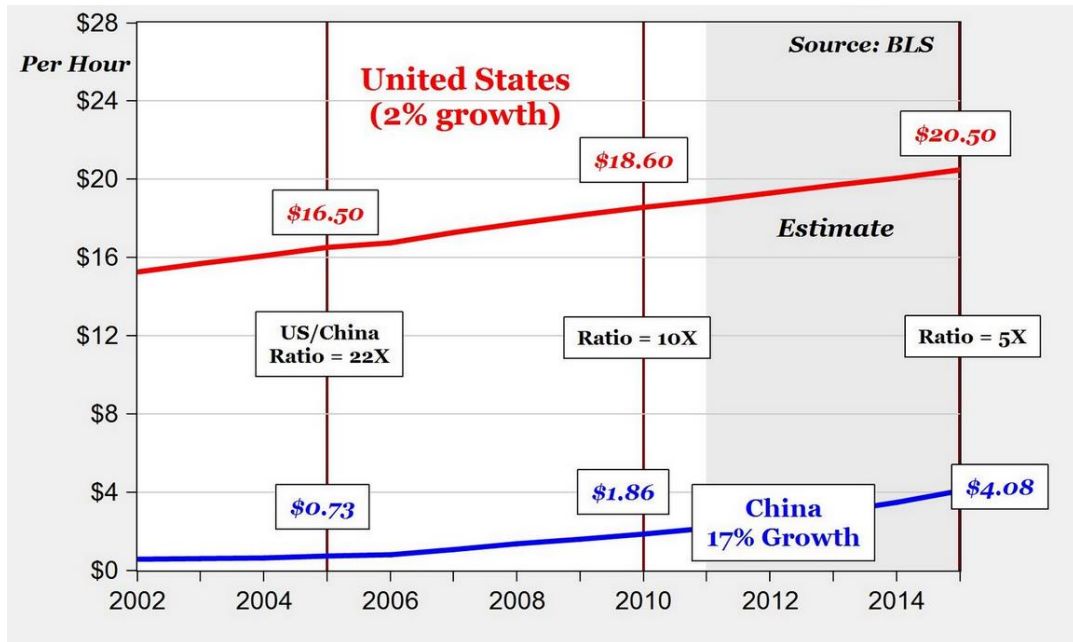


Figure 3 - USA vs China Average Yearly Wages in Manufacturing (2002-2015). Source: BLS

This is translated into the progressive decrease of the believe that China, and generally the Asian countries, are attractive location for cost reduction, and, consequently, encourage firms to find alternative location. Similarly, in some Eastern Europe countries as Romania, Poland, Hungary, the same phenomena happened, with back-reshoring of production activities as a natural consequence.

Moving to the *logistic cost*, Kinkel (2014) and Dachs & Cristoph (2014) show that an increase in the logistic cost has an influence significantly smaller than other reasons. For instance, on of such other reasons is the effective quality of the products manufactured abroad. Indeed, the poor quality of the production is one of the topics characterize by a paramount importance.

This factor enters into the category of the *host country characteristics*, and it is labelled as one of the most influent reason for RHC decision (Kinkel *et al.*, 2007; Kinkel & Maloca, 2009). At the category of *host country characteristics* belong also the availability, the skills and the productivity of the workforce (Fratocchi *et al.*, 2015).

Finally, Dachs and Cristoph (2014) add, at the category of the host country characteristics, the perceived possibility to lose part of the knowhow.

Among the *home country related factors*, the principal factor that emerges is the *made-in effect*. A psychological effect describing how consumers' attitudes, perceptions and purchasing decisions are influenced by products country of origin labelling. (Albertoni *et al.*, 2017). The underlying assumption of this factor is the believe that distinctive and value-adding feature of a product depend on where the product is manufactured. This means the strong advantage of country associated to high quality perception and competitive distinctive characteristics. In this category belong also the *political incentives* (Albertoni *et al.*, 2017). Governments, especially in US and Western Europe, started to put in practice several incentives in order to reattract firms that had previously delocalized production. Governments try, on one hand, to offer favourable conditions, in term of tax or firm specific benefits, and on the other to make pubic investments in order to foster innovation. In this respect, an example, is the “Industry 4.0” programme presented in Europe staring from 2011.

To conclude, the focus is placed on the *firm specific factors*. In particular, two factors are addressed as a reason for RHC operations. The first one is referred to the value chain concept, and to the effort to reduce the geographical distance between the value-adding activities of design and production (Doh *et al.*, 2009). The second one is linked to the need of a company of looking for an increase in automation. The targeted country, consequently, became the one in which there are more possibilities to obtain a more advanced and more reliable technologies.

Finally, we provide an additional framework (see figure 4) about the motivations of back-reshoring, based on the research of Di Mauro *et al.* (2018). This interpretative framework is based on an extensive literature review and on reports of consulting firms and/or press. It tries to summarize and categorize all the drivers concerning the back reshoring. The theoretical framework consists of two dimensions, specifically (a) the *goal* and (b) the *level of analysis*:

- (a) The *goal* dimension is split in “*customer perceived value*” vs “*cost efficiency*.” Customer perceived value refers to the customer’s perceived preference for an evaluation of product attribute, attribute performances (Woodruff, 1997, p.

142). Cost efficiency pertains, instead, to the minimization of overall costs by making a product or performing an activity in a better way (Fratocchi *et al.*, 2016).

(b) *The level of analysis* refers both to internal environment (i.e. *firm specific factors*) and external environment (i.e. *country-specific factors*).

Some factors are identified as hybrid, since may reflect for example both internal and external environment elements (e.g. *logistic costs* include both higher transportation costs, as fuel, and country specific factors as custom duties).

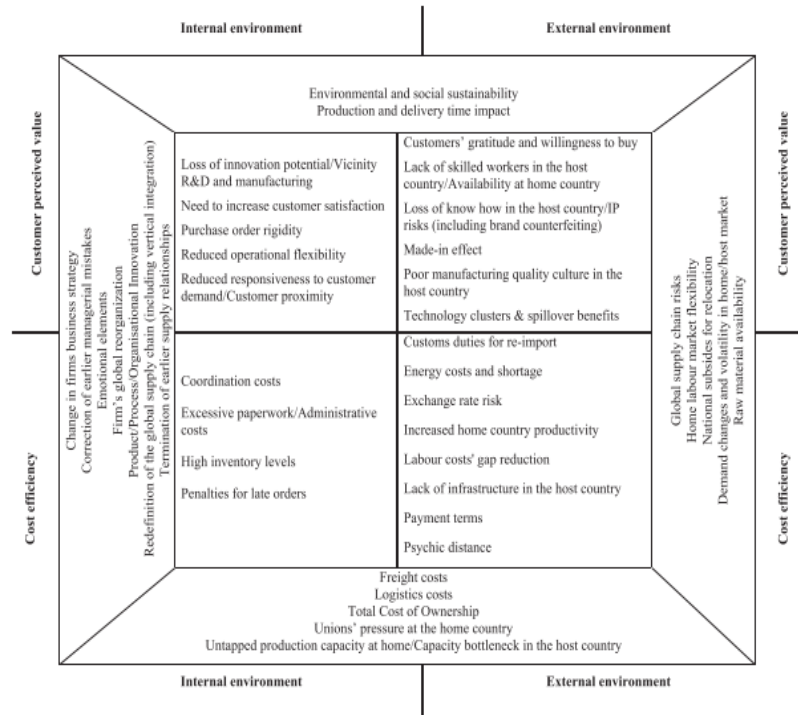


Figure 4 - Framework of the motivations for Back-reshoring. (Di Mauro *et al.*, 2018)

CHAPTER II

Reshoring: literature review and hypothesis development

After defining the concept and the implications of reshoring, it is possible to identify the current research trends and topics in the literature about relocations of production activities. The interest in the phenomenon is not recent (Mouhoud, 2007), but in the last years several scholars started to investigate and analyse the origins and characteristics of it.

We have identified the different topics within the literature concerning reshoring, with the aim of understanding the state of art on the phenomenon, in order to suggest a possible development in this field. For this reason, first of all we propose an overarching framework that groups all the different concepts and aspects covered in the literature and lately we will analysis the gap we found in the study of RSD (see figure 5, in the following pages).

We can summarize the main existing topics in the following: a *macro-level analysis*, concerning the external context of the firm (such as home and host country characteristics) and a *micro-level analysis*, regarding instead firm-specific characteristics.

It is worth noting that the interest, especially in the last years has been on the return to the home country (RHC) phenomenon, rather than on the relocations to third country (RTC). Back-reshoring cases increased dramatically, attracting academic attention in international business literature (Fratocchi *et al.*, 2013). Probably this is due not only for the novelty of the phenomenon but also because this phenomenon has

implications with the policies that home countries implement in order to re-attract companies.

2.1 – Macro-level analysis

The macro perspective refers to the characteristics of the external environment that influence the relocation decision. Research about reshoring has mostly concentrated on its motivations (Foerstl *et al.*, 2016; Fratocchi *et al.*, 2016), the most relevant being related to poor product quality, increase of costs and scarcity of skilled human resources (Baraldi *et al.*, 2018). Thus, these motivations are related to the host country characteristics or to a comparison respect those of the firm's home country. The reasons for reshoring often focus on international trade theory, strategic management theories (e.g. Resource Based View (RBV) and TCE theory), International Business frameworks (e.g. eclectic paradigm and internalization theory) or location theories.

TCE theory explains how the high coordination and incentive costs faced by firms in the host country respect to the home one may influence the reshoring decision. In particular some authors have indicated that cultural and geographical distance can increase the risk of opportunistic behaviour (Kinkel & Maloca, 2009). RBV (Teece *et al.*, 1997) connects reshoring to concerns for firms' strategic resources and capabilities when firms operate in foreign contexts. The decisions of reshoring may reflect the inability of the firms to develop critical tangible and intangible assets abroad; to transfer them to the host country; or to exploit and access resources of the host country in order to create competitive advantage (Canham & Hamilton, 2013).

Internalization theory (Buckley & Casson, 1976) and the "eclectic paradigm" of Dunning, have also been applied to the international reconfiguration of the firm, including reshoring. The idea is that reconfigurations of the supply chain of the firm are influenced by changes in the fundamental parameters of the economy (Fratocchi *et al.*, 2016). Dunning's paradigm explain how reshoring can be related to changes in location-specific advantages, i.e. changes in the home and/or host country characteristics (Ellram *et al.*, 2013) or from the decline of ownership and internationalization advantages related to the offshoring decision.

Finally, some authors (Grey *et al.*, 2013; Kinkel & Maloca *et al.*, 2009) state that reshoring could represent also the correction of the first relocation decision due to the lack of knowledge about the foreign destination or the inability to properly quantify some location-specific factors regarding the host country (Fratocchi *et al.*, 2016).

As discussed in the previous chapter the offshoring decision is connected with some key drivers, that Dunning (1993) underlined in market-seeking, asset-seeking, efficiency seeking (both in term of cost-saving and productivity-enhancing) and resource-seeking. The first studies investigate what were the drivers of the first relocation decision (Kinkel & Maloca, 2009) but then some scholars tried to investigate what is the connections between the above drivers and the reshoring decision.

A useful contribution in this perspective is given by Barbieri *et al.* (2019) in '*Relocation of second degree: Moving towards a new place or returning home?*'. This research focuses the attention on the market, asset and efficiency seeking location advantages (or 'drivers') of the offshoring decision and on the types of relocation of second degree that firms decide to undertake in Europe, distinguishing between RTC and RHC. What emerged is that when companies decide to relocate part or full of production because of a market seeking investments, the probability to back-reshore the production rather than invest in a new market, is higher. This means that probably enterprises which enter a market in order to better serve it, after a certain period, having penetrated it, tend to return to the home country. In some case the process might be fostered by the lower satisfaction in term of sales performance or by the decrease of transaction costs due to the better economic and political integration of the EU. Secondly, when enterprises try to search better conditions in order to decrease costs (*labour cost reduction*) or improve the productivity (*productivity enhancing*) there is a higher propensity of implementing a RTC. Firms, in fact, are inclined to move continuously in favour of those countries that give the opportunity to increase the efficiency of the production, usually because the savings obtained abroad are lower than what expected or due to a lower quality experienced in the host country. For asset seeking investments, instead, evidences are not clear. Companies may decide to undertake a RHC when the location advantages of the specific assets have run out. The decision should be seen as the accomplishment of the strategic purpose investment,

since after the companies have obtained the needed synergies and knowledge, the production is transferred in the home country. In other cases it is more likely to choose a third new location if this country offer a superior or complementary asset.

Another important macro-level aspect, that is gaining momentum, is related to the Fourth Industrial Revolution (FIR), also known as Industry 4.0, that plays the role of re-attract production activities previously offshored. This new industrial revolution refers to the diffusion of new digital technologies that are widely acknowledged to hold a truly disruptive potential on manufacturing systems, products, and business models (Strange and Zucchella, 2017). The access to these new technologies can decrease the interest of firms in searching low cost locations since this technology will allow to benefit of low production costs in high-income country as well (Dachs, 2017).

The existing literature of reshoring still did not explore explicitly the connections between reshoring and Industry 4.0 but one of the recent contributions is constituted by Müller *et al.* (2017), who summarized the effects of Industry 4.0 technologies and related relocation initiatives. In particular this research, based on 50 German firms, found a relationship between Industry 4.0 plans and back-reshoring. The three claims sustained by the authors are:

- *Industry 4.0 will play a role in bringing back production to Germany;*
- *Industry 4.0 will play a role in setting up new production facilities in Germany;*
- *Industry 4.0 will play a role in switching from foreign to German suppliers”.*

Clearly, the FIR represent an important point in the actual economy, so many governments started to see Industry 4.0 not only as a chance to reinforce the manufacturing sector but also as an opportunity to promote the return of activities that were previously relocated abroad (Elia *et al.*, 2019). Thus, Industry 4.0 policies are a critical element at country level that can influence the relocation decision, and policies stimulating expenditure in new technologies of manufacturing systems are increasingly adopted in various countries (Lasi *et al.*, 2014). Germany in 2011 was the first in Europe to launch the “Industrie 4.0” program followed by USA in 2012.

European Union (EU) promoted these initiatives both at country and regional level and all the countries in EU have launched their own program in the following years.

The result of this initiatives regards also the countries that are usually preferred for the first relocation. China for example has adopted policies to contrast the potential outflow of manufacturing. The China 2025 plan try to incentive Chinese manufacturers to increase capital investments in automation and digitalization, even if China is still behind other nations in term of robot density (Ancarani *et al.*, 2018).

2.2 – Micro-level analysis

Once a systematic conceptualization of the reshoring phenomenon and the major macro-level trends are defined, the focus is shifted to a micro-level analysis, and so on the interactions between the single firms characteristics and the reshoring trend.

As widely and in detail explained previously, the reshoring motivations and the main trend highlighted by the literature are usually connected to the changes in the external environment, and firms generally consider the host country macro-contest and/or the comparison with the home country as reason for the decision (Foerstl *et al.*, 2016; Fratocchi *et al.*, 2016; Baraldi *et al.*, 2018). However, it is necessary to broad this knowledge, and, consequently, to analyse the motivations and major trends that adopt a company perspective.

In particularly, Baraldi *et al.* (2018) gave a new point of view based on the Industrial Marketing and Purchasing (IMP) contribution, which point out how the inter-organizational networks and relationships, that emerges from the interactions between suppliers and customers, can constrain the behaviour of firms, creating complex economic, technical and social interdependencies (Baraldi *et al.*, 2018). More specifically, according to IMP, a relocation of second degree implies re-embedding the activities, creating links between those located in the original network context and the others brought back. In a nutshell, when a firm decides to reshore production into a new country, this means a redesign of the geographical network of the activities. From an activity point of view, the reshored activities need to be reconnected with the result is a sort of resistance from the actors of the network towards the “novel element”,

affecting negatively, in this way, the performance of the company (IMP). What suggest Baraldi *et al.* (2018) to alleviate this possible negative impact, is the re-creation of the connections along the ARA (*Activities, Resources and Actors*): the resources require new interfaces, while the actors the establishment of new business relationship or the restoring of commitment and trust among the involved actors activity pattern of the network structure located in the home country, that is, with the activity structures of the single companies still located in the home country and with the activity links connecting these companies one by one. From the point of view of the resources instead, reshored activities generally require using several physical and immaterial resources, alone and in combination with each other. Therefore, this also requires re-creating resource interfaces between inputs (e.g. raw materials) and outputs of the reshored activities (e.g. end products) on the one hand, and the resource structures of the single companies in the home-country context, comprising such elements as competences, machinery and brands on the other hand. From an actor point of view, bringing back activities in a particular network context also involves the identity of the reshoring company, that is, how it is perceived by the local web of actors as well as the mutual trust and commitment between these actors (Baraldi *et al.*, 2018).

To conclude, the focus is posed on the duration of offshoring decision. Several studies did not implement an in depth-analysis but look just at the average time between the first and second relocation decision (Fratocchi *et al.*, 2014; Fratocchi *et al.*, 2013). Moreover, it is important to highlight that the majority of articles have never focused their attention on the reshoring exit strategy. Only Ancarani *et al.* (2018) instead, due to the relevance gaining by RHCs in the recent years, has developed an in-depth analysis of the duration of return to the home country, investigating the determinants of 249 offshore manufacturing observations. The study summarized in a conceptual framework all the characteristics that may have an influence on the duration of offshoring activities prior to reshoring: (i) *company and investment specific characteristics*, (ii) *industry characteristics* and (iii) *home and host country specific characteristics*. Firstly (i) *Company and investment specific characteristics* investigate the impact of high irreversibility and asset specificity of the investments on the duration. The results show a positive correlation between high company specific investment and the duration of the RSD. It is highlighted also a direct and positive

relationship between the size of the firms and the duration. Big enterprises in fact tend to offshore activities for a longer time, probably due to the high number of resources they possess (Ancarani *et al.*, 2018). Secondly, also the (ii) *industry* affects the duration. Enterprises that operate in highly competitive industries (e.g. electronics) show an average survival time lower respect other industry. These sectors are, generally, characterized by a higher outsourcing propensity and locations advantages change often, reflecting market and cost conditions (Mudambi and Venzin, 2010). Thirdly, (iii) *home and host country specific characteristics* need to be considered. According to Dunning (2000), changing country comparative advantages can influence the duration of the relocation. In addition, country risk, as political, economic and financial stability, and a higher cultural distance can shorten the duration of the experience. Tax incentives, policies and an increase in the labour productivity in the home country may instead foster the RHC, decreasing the duration (Ancarani *et al.*, 2018). Finally, in case of back-reshoring the relocation decision usually last 3-5 years (Ancarani *et al.*, 2018), in line with Kinkel (2009) that considers it a “short-term correction of prior location misjudgements, rather than a long-term reaction to slowly emerging local development trends”.

2.3 – Meso-level analysis

An important gap present in the actual literature of reshoring, regards characteristics that are neither country- nor firm-specific related. In particular relocations of second degree cannot be caused only by the differences between home and host country environment and by the behaviour of the enterprises involved.

Specifically, even considering the macro and micro perspective, the decision to transfer part or full of the production can still be influenced also by the context in which the firm is posed, i.e. the competitive environment in which companies operate. The typical dimension we are referring to is the industry or sector of the companies. Some characteristics of the firms, in fact, are connected to the industry to which the firm belongs. Automotive industry has different peculiarities respect to furniture one; chemical sector do not possess the characteristics of food products manufacturing, since they operate in diverse contexts. The firms, therefore, have features and needs

not equal, which can impact on the specific strategic decisions implemented. This perspective can be called *meso-level* since stand in between the two dimensions underlined in the previous paragraphs.

Thus, it is important to understand if industry characteristics play a role on the internationalization strategies, as reshoring, comprehending if these characteristics impact in the choice between the two alternatives about relocations of second degree, RHC and RTC. In addition, the relevance of an industry analysis can help the understanding of forces underlying competitiveness. The industry structure is under continuous strain, especially in EU, from competitive forces, and traditional protection mechanisms are weak in term of effectiveness. Hence, firms in ‘old’ industries are under constant pressure with the risk to disappear completely, while enterprises in ‘new’ industries face an uphill struggle to get in new markets and evolve abilities to face off competitive pressures of incumbents or other new entrants (O’Mahony & Van Ark, 2003).

Moreover, some scholars mentioned that an analysis of the different manufacturing sectors is needed but without specifying the dimensions of this analysis (Di Mauro *et al.*, 2018); some others instead, in their studies point out how an industry perspective is very relevant in order to understand the dynamics of reshoring initiatives. In particular, Fratocchi *et al.* (2014) propose that future research should focus the attention on the behaviour of the firms making a distinction between capital and labour intensity industries and between the different value chain activities of the companies. Generally, authors appear conscious that in the comprehension of reshoring phenomenon, an industry analysis represents a step forward.

After defining the importance of conducting an industry analysis regarding relocations of second degree, the sectorial dimension of the study must be identified. The best way to organize the research is to use industry taxonomies or classifications, which organize firms into industrial groups based on similar behaviour in the markets, similar products or similar production processes.

We now analyse the industry perspective using three dimensions, affecting different sectorial aspects. The first classification is made to analyse the tendency of companies to *outsource* the production activities. Secondly, it is possible to distinguish

firms using a high or low proportion of capital and workforce, so enterprises belonging to *capital or labour intensive* industries. The last aspect takes into account the *technological intensity* of the industry.

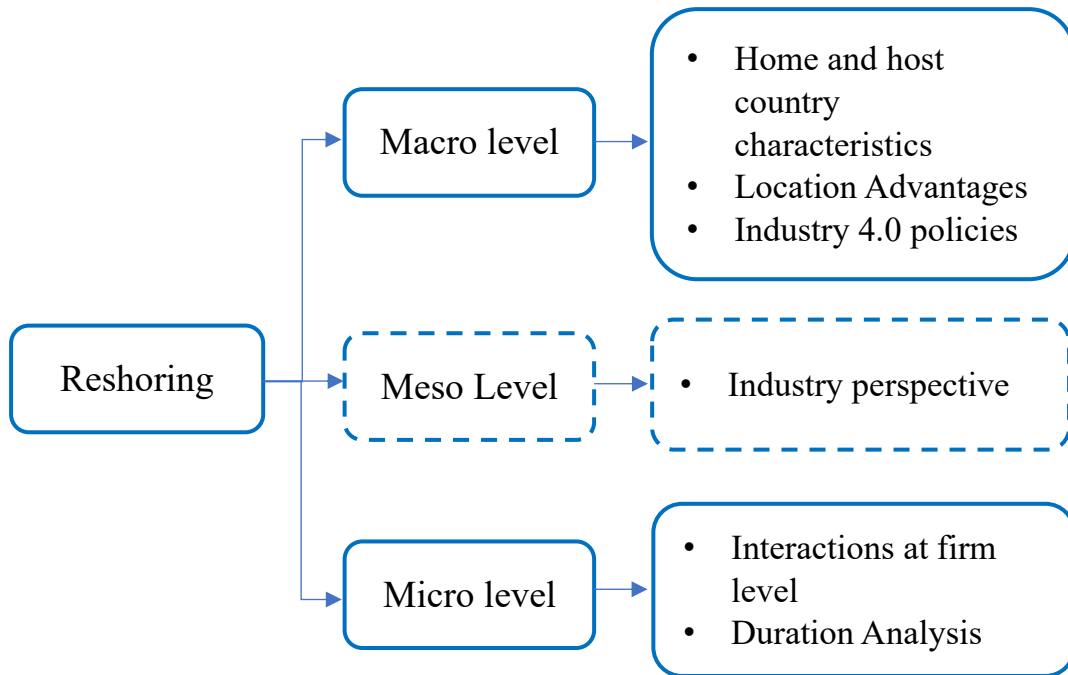


Figure 5 - Macro, Meso and Micro perspective of Reshoring

2.4 – Hypothesis Development

2.4.1 – Outsourcing Propensity dimension

Corporate headquarters are under great pressure to create value for their business. They must achieve a “parenting advantage” and strive to be the best possible parents for their business (Goold *et al.*, 1994). To create advantages for their companies and to meet the value creation challenge for their businesses, corporate managers look more and more to outsourcing (Quélin & Duhamel, 2003). Increasingly requiring company-wide policies to be consistent and shared services to help the firm’s businesses develop, outsourcing modifies the firm’s frontiers. The pressure from the market and the financial operators to reduce asset investments and to outsource certain activities (e.g. manufacturing, inventory, warehouses or real estate) is intensive, as these actors expect improvements in the value created for shareholders. Indeed, there is evidence that outsourcing contributes positively to market value (Rappaport, 1986; Alexander and Young, 1996; Hayes *et al.*, 2000). Yet it must also create value for the firm (reduced costs, improved performance) and for the end user. For outsourcing to be meaningful, both value creation and value appropriation processes must be appraised (Alexander and Young, 1996; Auguste *et al.*, 2002).

In other words, outsourcing is a choice that lies in the corporate policy, not just business strategy area, as it modifies the firm’s boundaries as a legal entity and generally involves top management decision makers. Affecting company-wide resource allocation policies and asset management practices, outsourcing decisions often involve several divisions in large and diversified companies (Quélin & Duhamel, 2003). Since the industry outsourcing propensity are embedded in the firm’s corporate strategy, it is therefore not surprising that scholars have been recently suggested to investigate the industrial characteristics in the RSD phenomenon, in the way to understand how it affects the firm’s manufacturing location decisions, and the reconfiguration of global value chains.

As highlighted in the previous sections, we are not aware of researches that investigate the relationship between the propensity of outsourcing and the RSD operations, both RTC and RHC. It is, therefore, necessary to develop an analysis that

studies in parallel the two different phenomena, with the objective to understand the link between them.

Starting from the reshoring phenomenon, and taking up what was said in the first chapter, studies that generally investigated the RHC drivers led, in a certain way, to mixed findings about the role of specific industrial characteristic, such as the outsourcing propensity.

Recent debate has started to recognize that location choices, over time, are subject to change and the configuration of a firm's global manufacturing footprint is not static (Fynes *et al.*, 2015). Innovations in business models (Grandinetti & Tabacco, 2015), modified perceptions about relevant driver, or changes in the global equilibrium, can play a role in the firm's rethinking of their global manufacturing footprint. Existing studies have stated that a large number of companies are not necessarily gaining real benefits from their offshoring ventures (Christopher & Holweg, 2011; Manning, 2014). Hence, the decision to modify their manufacturing locations can also be attributed to those lower than expected outcomes (Kinkel, 2014). Thus, company are forced to move again in search of the benefits expected (Barbieri *et al.*, 2019). In spite of the somewhat contrasting results, common across literature is the assumption that one of the most relevant driver in the RSD operations, and in RTC specifically, is the importance of labor and production cost on the firm's relocation choice. Indeed, the reasons behind these strategic choices were mainly related to the search for lower costs or greater flexibility in carrying out production activity (Gray *et al.*, 2013). The focus is therefore on countries, which offer highly flexible and low-cost labor markets. In other words, companies look for advantages in terms of cost, especially with reference to manufacturing factors such as work and energy, but also lower rates of tax and duties on import and export (Gray *et al.*, 2013). Refining the analysis, Barbieri *et al.* (2019) state that in case of company looking for an improve of the productivity (*productivity enhancing*) there is a higher propensity of implementing a RTC operations over a RHC. Firms, in fact, are inclined to move continuously in favour of those countries that give them the opportunity to increase the efficiency of the production, both reducing production cost or improving productivity.

Therefore, it is clear that, especially, in the RTC decision the efficiency driver plays a central role. Moving our attention, now the objective become to understand how the degree of outsourcing can influence companies' relocation pattern.

A large number of contributions have highlighted how the massive use of outsourcing offers several advantages in terms of cost reduction (Lacity & Hirscheim, 1993; McFarlan & Nolan, 1995; Barthélemy & Geyer, 2000; Kakabadse and Kakabadse, 2002) and focus on core competencies (Quinn & Hilmer, 1994; Saunders *et al.*, 1997; Alexander & Young, 1996; McFarlan & Nolan, 1995, Kakabadse and Kakabadse, 2002). To explain a few, outsourcing is a means to lower costs. That operational cost savings are a primary reason encouraging firms to outsource highlights the perception managers have of the role which outsourcing plays in improving a firm's operational efficiency (Brown *et al.*, 2002). This cost reduction objective, can also be achieved by rationalizing and by cutting costs internally, notably by sharing resources. The study of Auguste *et al.* (2002) shows that outsourcing addresses other important objectives besides that of cost savings. For instance, it can also be seen as a tool of growth for the firm's core business activities. Thus, the propensity of outsourcing decreases cost (Lacity & Hirscheim, 1993; McFarlan & Nolan, 1995;), increase flexibility (Barthélemy & Geyer, 2000) as they make the production process smaller and more reliable, due to the focus on core competencies (Kakabadse and Kakabadse, 2002). Besides, the use of outsourcing seems to decrease the labour needed, thus reducing the relevance of wage gaps between high- and low-income countries (Quélin & Duhamel, 2003).

What emerges is that the use of outsourcing can be seen as an alternative to a relocation of second degree operations, and in particular to a relocation to third country. Indeed, a massive recourse to outsourcing can eliminate, or at least weaken, the location advantages of low cost countries and, simultaneously, allow companies to be more focused on core competencies and to gain access to external competencies and to improve quality (Barthélemy & Geyer, 2000; Quélin & Duhamel, 2003). As discussed in previous chapter and supported by literature, for companies, and especially efficiency-seeking firms, localization of manufacturing activities in countries where production costs are lower or productivity is higher is of crucial importance (Elia *et al.*, 2019). Therefore, companies have started to establish their

production activities in countries with low cost or high productivity advantages over the past decades, despite the higher vulnerability, longer lead times, and frequent quality issues experienced within their globally extended supply chains (Brennan *et al.*, 2015). The use of outsourcing seems to be a valuable alternative, representing the opportunity to reduce costs or increase flexibility, while eliminating the limits and the disadvantage of offshoring. As a result, it is expected that firms operating in industry with a high propensity to outsourcing will show an increased propensity to opt for a RHC when undertaking a relocation of second degree.

HP 1: Firms operating in industry characterized by a high propensity to outsourcing are more likely to undertake a RHC than a RTC when adopting a RSD strategy.

2.4.2 – Capital Intensity dimension

An important distinction made analysing the economic activities of an enterprise refers to the quantity of capital and labour used. Firms are often labelled capital or labour intensive, according to the amount of capital and/or workforce utilized. Industries vary according to basic production technologies, which can be summarised by capital labour ratios (O'Mahony & Van Ark, 2003). Generally, in fact, an industry is defined as capital intensive when it requires a large amount of investment and capital to produce goods or services. Firms belonging to these industries, as a consequence, need big amounts of fixed assets as plant, equipment, machineries respect the number of workers (Kapoor, 2016). Furthermore, capital intensive industries tend to have high levels of operating leverage, which is the ratio of fixed costs to variable costs. As a result, capital intensive industries need a high volume of production to provide an adequate return on investment. This also means that small changes in sales can lead to big changes in profits and return on invested capital (Arnaboldi *et al.*, 2014). Examples of capital intensive industries include chemicals, pharmaceuticals and the oil refining industry (Dachs *et al.*, 2014), while manufacturing of textiles, wearing apparel and furniture are identified as labour intensive (Fratocchi *et al.*, 2013; Di Mauro *et al.*, 2018).

The way of doing business for firms it is not the same, in particular companies in capital and labour intensive sectors use different factors of production and compete in diverse environment, utilizing dissimilar expertise. It is extremely relevant to try to understand how this dissimilarity affect reshoring because the priorities and the aspects taken into consideration when implementing a relocation of second degree are for sure different.

Firms in labour intensive industries use a high percentage of labour force, thus workers are a critical and strategic part of the organization. It is expected a different result in term of choices regarding the delocalization of production, especially because one of the most important aspects considered in reshoring it is the reduction of workers and the impact of this decision on the employment level of the country.

In order to understand the different behaviour of enterprises that implement a relocation of second degree when they are part of capital- or labour-intensive industries, a connection with the motivations of reshoring is needed. The first and most important reason considered by firms, as already explained in section 1.3, is related to the efficiency improvement. Efficiency seeking is a fundamental driver which can be distinct in cost reduction and productivity enhancing but more precisely, among the most frequently cited motivations for reshoring there is the reduction of labour costs between host and home countries (Fratocchi *et al.*, 2016). Reshoring should reflect changes in the availability and costs of factors between countries that modify their comparative advantages and replace the attractiveness of production in the first host country (Martínez-Mora and Merino, 2014). In addition in the last decades, as seen, countries in Eastern Europe (like Poland and Romania) or in Asia (like China), experienced an increase in wages, that decreased the cost location advantage, pushing companies in the search of new places where delocalize plants (Barbieri *et al.*, 2019; Di Mauro *et al.*, 2018).

In this perspective, considering the cost reduction as the main motivations, combined with the rising labour costs in low wage countries, it is possible to suppose that companies in labour intensive industries are inclined to continuously move exploring new countries, with the aim of reducing the labour costs. It is expected generally a high number of movements of production activities, driven by the search

of the best low-cost locations. This is partially confirmed by Barbieri *et al.* (2019), which analysed how in general when the drivers of the relocations is efficiency seeking, firms tend to implement more RTC, rather than RHC, following the change in the location comparative advantage.

On the other hand, capital intensive enterprises by definition have a lower proportion of workforce, so theoretically a lower need and propensity of reducing labour costs. This can lead to a lower tendency to search new places that offer a lower labour cost since on the contrary, in capital intensive sectors firms possess a large amount of fixed assets as machineries and equipment. So enterprises, after entering in a new market, can choose to come back home (RHC), having a lower necessity to search better conditions in term of labour costs.

Combining together all these elements it is possible to develop the second hypothesis:

HP 2: Firms operating in sectors characterized by high capital intensity are more likely to undertake a RHC than a RTC when adopting a RSD strategy.

2.4.3 – Technological Intensity dimension

Another relevant industry perspective is the level of technological intensity of the firms. Technological intensity can be defined as the level of knowledge embedded in firms' products in every industrial sector and this measure is generally indicated as the average R&D spending by the firm's revenue or as the R&D over the Value Added (Zawislak *et al.*, 2018). Most of studies consider technological intensity as the consequence of a positive relationship between the R&D spending, meaning that more a sector is high tech, greater are its performance (Hatzichronoglu, 1997).

Typically, the technological intensity refers to the internal organizational context. Technological intensity is associated with the degree of sophistication and customization of the production process. Low technology-intensity industries are characterized by long-linked, and to a limited extent, mediating technologies that

emphasize standardization and efficiency in the production process. High technological intensity is instead characterized more by customization that highlight responsiveness to the requirements of customers (Thompson, 1967). One aspect of technological intensity is the level to which organizations must rely on standardized processes and knowledge or depend on unique employee contributions that are subject to continuous adaptation and change (Lepak *et al.*, 2003).

Companies with a low technological intensity are viewed as relatively stable in terms of the core transformational processes on which their infrastructure is based (Scott, 1992). Furthermore, the job demands of non-intensive technologies is often viewed as repetitive and characterized by high standardization, with employees, that have a limited discretion, in an attempt to increase the efficiency (Thompson, 1967). In fact, the skills which are required, are usually commonly available and individuals are seen as interchangeable, thus the level of variable contribution from workers is likely to be limited. Hence in case of low task uncertainty, the demands placed on dedicated employee knowledge and information process are likely to be minimal (Galbraith, 1973; Schoonhoven, 1981).

When the technological intensity increases, the transformation processes become more variable, so technological intensity requires products, services and proprietary knowledge that are critical for the success of the organization (Osborn & Baughn, 1990). In addition, technological intensity increases the degree of internal uncertainty or fluctuation regarding need of employee contributions (Thompson, 1967). Hence, due to the fact that knowledge-based employees can execute an extensive variety of tasks, their connection with the performance of the firms should be highest when technological intensity is high and declines when technological intensity decreases (Lepak *et al.*, 2003). Therefore, it has been normally accepted that enterprises which are high technological intensive are more innovative, more efficient, pay higher salaries and are more successful than low tech intensive companies (Markwald,2004; Hatzichronoglou, 1997).

It is expected that high technological intensive firms are more involved in relocations of second degree since the environment in which they operate is more complex and uncertain. As already point out, there is a higher need of proprietary

knowledge, assets, synergies that cannot be always available in the home country, thus companies have a higher necessity to change context and this pushes firms in the direction of deciding to relocate part or full of production abroad. On the other hand, after the first offshoring decision, companies may have obtained those assets and resources, so the knowledge sourcing process is concluded and it is possible to come back home, reducing transactions costs and the risk connected to operate in a foreign environment.

Furthermore, Felsentein and Bar-El (1989), defined technological intensity as a multidimensional character that consists of three dimensions, two about the industrial inputs (capital and labour) and one to the output (product). The 'labour' technological intensity is related to the quantity of experience and skill levels of the workforce in industry, while the technological intensity of 'capital' regards the amount of capital invested. The product's technological intensity refers to industries that make large investments for the development of new processes and products. Finally, this vision of technological intensity is related to the traditional analysis of the ratio between capital and labour, in which the more capital-intensive an industrial sector is, the more technologically intensive it will be, and vice-versa (Zawislak *et al.*, 2018).

In addition, recently the discovery of new technologies is associated with the industry development from the early adoption of mechanical systems, to support production processes, to a highly automated assembly lines in order to have a higher responsiveness and adaptation to actual dynamic market requirements and demands (Lee *et al.*, 2014). An example of this technologies is the so called 'Industry 4.0', where the machines are connected as a collaborative community. This kind of evolution need the utilization of advanced production tools, in order to process data and information that allow to take more informed decisions. All these new technologies go in the direction of a labour costs reduction, providing a better working environment and a higher efficiency (Lee *et al.*, 2014). Moreover, Industry 4.0 has been recently considered by scholars in International Business as an element that alter location advantages and the geography of production and global value chain (Ancarani *et al.*, 2019). In particular authors in literature suggested a correlation between Industry 4.0 and manufacturing location decisions that increase the repatriation of production activities (Ancarani *et al.*, 2018). Furthermore, enterprises are expected to adopt new

technologies, as those of the FIR when the technological intensity and the complexity of the supply chain are high (Foerstl *et al.*, 2016; Ancarani *et al.*, 2019). According to this view, the higher is the technological intensity, the higher is the adoption of this new technologies, so greater is the efficiency obtained. For this reason, high tech firms tend to substitute more labour with capital, thus high tech-companies when relocate production activities have a lower tendency to move in other countries in search of better conditions, preferring return to the home country.

Finally, regarding the relationship between reshoring and high-tech industries, Dachs *et al.* (2015) provide a useful contribution. In particular the authors, performed an analysis of the back-reshoring phenomenon, underlines that the number of firms, which back-reshore production, was the double in high-tech industries respect enterprises in low-tech industries. As a consequence, it is possible to state that RHC appears more frequent in high-tech industries rather than in low-tech ones.

HP 3: Firms operating in sectors characterized by high technological intensity are more likely to undertake a RHC than a RTC when adopting a RSD strategy.

CHAPTER III

Descriptive Statistics

3.1 - The database

The analysis of reshoring phenomenon was conducted using data from the European Restructuring Monitor (ERM), which comprehends relocations of production activities, full or in part, occurred in Europe between 2002 and 2015 and from the European Reshoring Monitor, concerning relocations in Europe between 2015 and 2018. The sample considered was constituted by 589 observations and 345 different firms, thus meaning that some companies carried out more than one movement. The data in both cases were gathered from newspapers and business press in the EU28 Member States and Norway. Also other sources are used, including company websites, and specific sources dealing with restructuring processes. The ERM considers only relocations that meet at least one of the following criteria: (1) *affects at least one European country*; (2) *consider a reduction of at least 100 workers and* (3) *involves at least 10% of the workforce in sites with more than 250 employees*.

The dataset describes RSD from 2002 to 2018 and includes information about: the headquarter, the country in which production was previously offshored (home country), the first host country and the second host country, which is the final destination in case of RTC. Other details comprehend the announcement year, the job reduction, the NACE code 2-digits and the motivations of the decisions.

We performed different descriptive statistics, using the whole sample constituted by 589 RSD and in some cases also a subsample composed by 343 firms with the headquarter (HQ) in Europe, in order to identify possible differences between European and Non-European enterprises.

3.2 – Countries

Figure 6 shows the origin countries of the first relocation decision (country A). What emerged is that almost one third of them are US based (29%). The others most represented in the sample are instead Western European countries: Germany (13,8%), Great Britain (7,1%), France (6,6%), Sweden (5,8%) with some cases for Japan (5,2%). Very few evidences arise from non-European countries (except USA) with around 2% for Canada and Australia. This confirm the theories that consider offshoring a phenomenon that starts from developed countries.

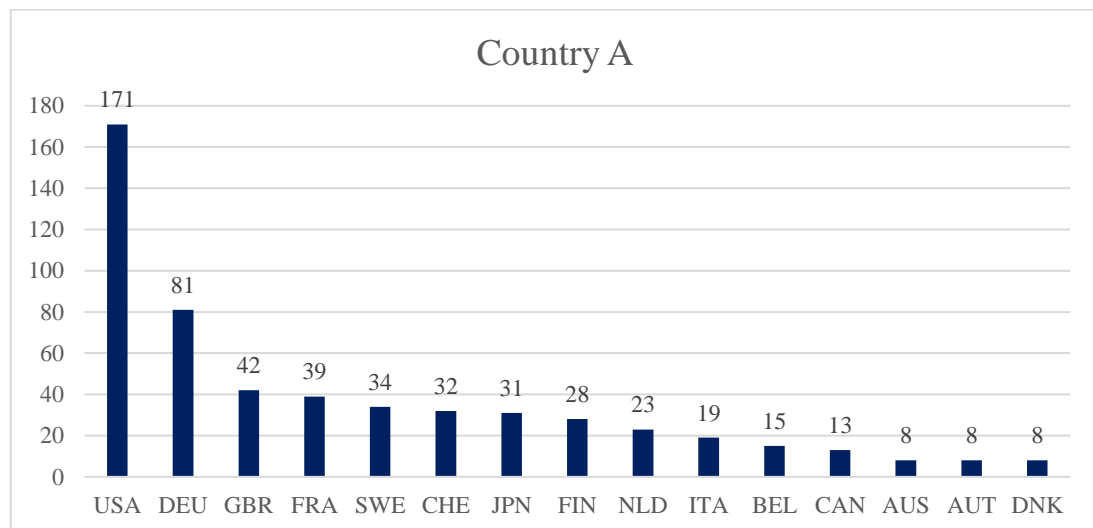


Figure 6 - Country A distribution

The destination for the offshoring decision (country B) is instead mainly Europe. In fact the dataset is composed by firms that chose the “old continent” for their first relocation. In particularly offshoring is concentrated in Western Europe and in countries that are part of the EU. France (13,6%), Great Britain (12,1%) and Germany (9,2%) are the cases most present, thus showing that firms decided to delocalized production in well developed countries, with strong economies.

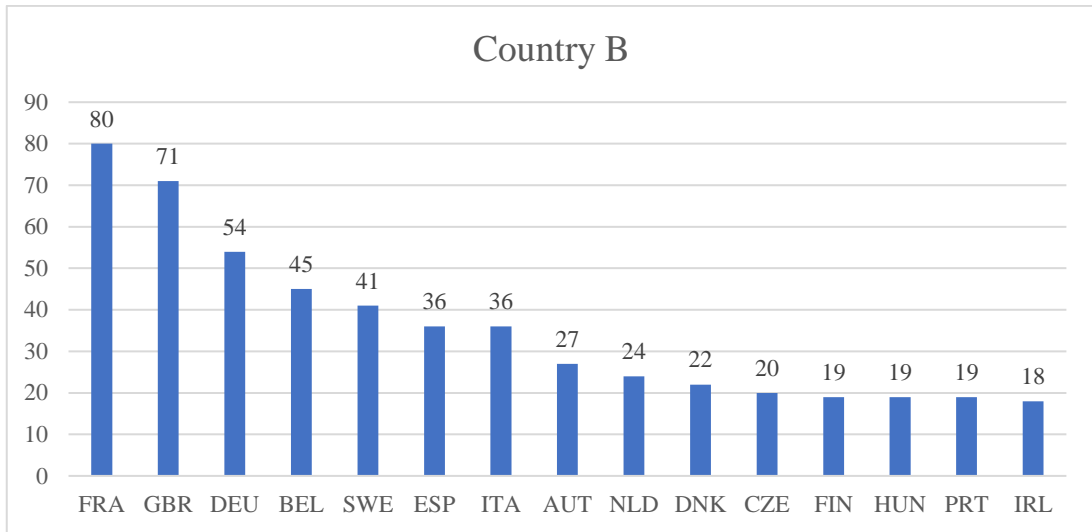


Figure 7 - Country B distribution

The countries involved in RSD (country C) are, as explained at the beginning of the chapter, all European, in particular Poland showed higher evidences with 105 relocations (17,8%), followed by Czech Republic (10,9%). In this case Eastern Europe is well represented in the sample counting 346 cases (58%). This strengthens the main drivers that is considered by enterprises when decide to delocalise production in a new country, that is cost efficiency. This states can offer in fact lower wages to workers and are preferred if companies are looking for cost reduction. An exception is Germany (10,7%), a well-developed country, that is characterized by high technology and high productivity and that offer qualified employees. In this case the reasons for a Relocation of Second Degree is in the 57% of cases a RHC, probably due to particular policies implemented to attract national firms.

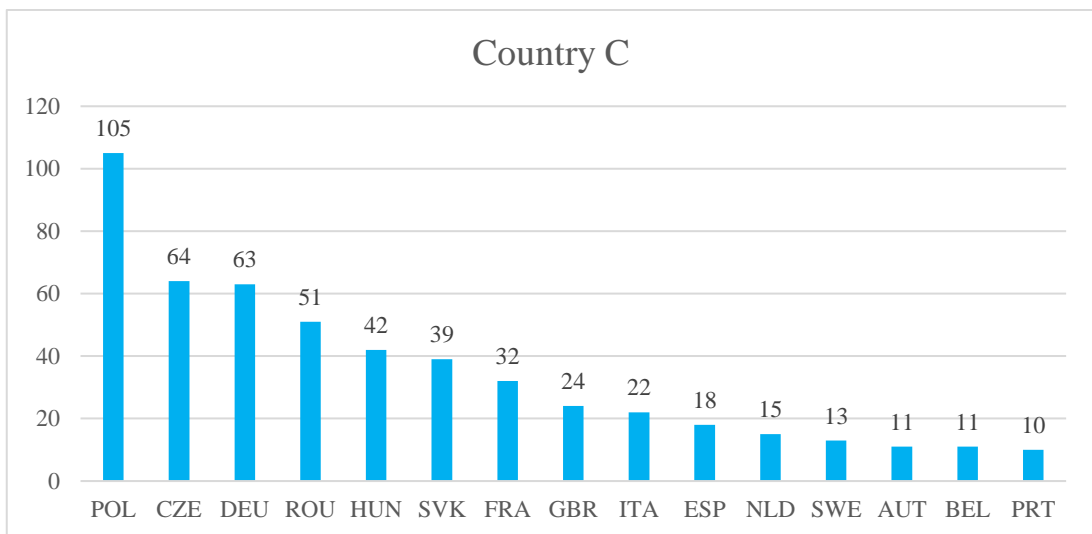


Figure 8 - Country C distribution

Finally we observe the balance from-to in order to investigate which countries suffer more the reshoring phenomena and in which instead it has a positive impact. The analysis aims at highlighting, country by country, the number of observations in which the country is indicated as Country B (i.e. the country from which the company leaves) and Country C (i.e. the country to which the company move). Generally, the balance is negative (higher number of observations where the country analysed is labelled as Country B), especially for countries in Western Europe as Belgium, France, Great Britain, and Italy. Eastern Europe countries are able instead to attract firms and the balance is positive with Poland, Czech Republic, Romania and Hungary that are the destinations preferred for reshoring. An exception, again, is Germany, a western country where the result between ingoing and outgoing investments is positive.

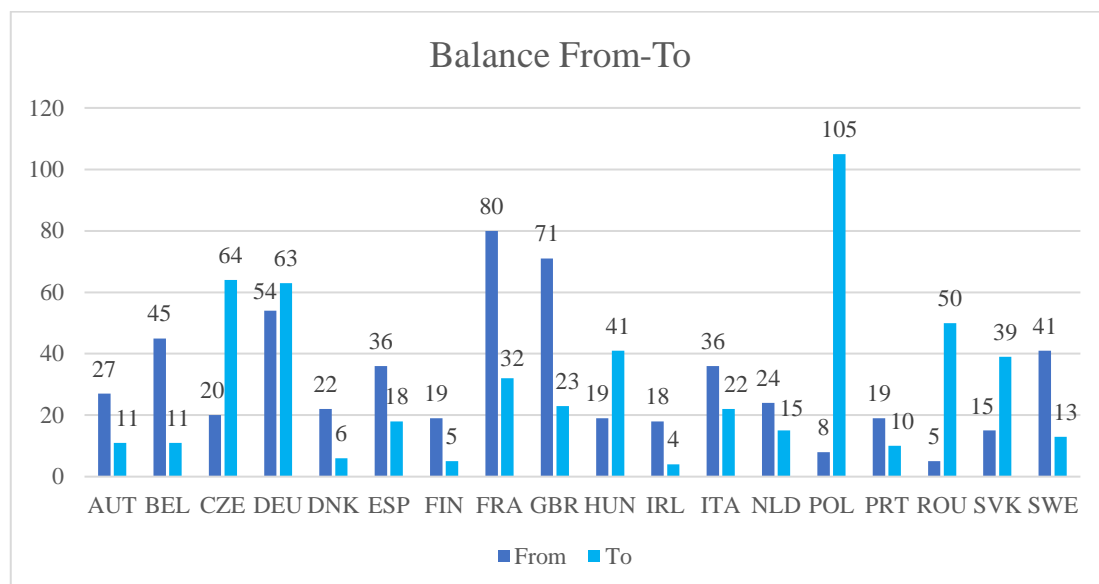


Figure 9 - Balance From-To locations

3.3 – RHC vs. RTC

First we analysed the distinction in our dataset between RTC and RHC cases. RTC represent the 83% of cases, confirming that Back-Reshoring is still a new phenomenon and is the minority of the overall RSD. Companies headquartered in Europe that perform a RTC are instead exactly the 50% of all RTC cases while obviously all RHC cases refer to firms based in Europe.

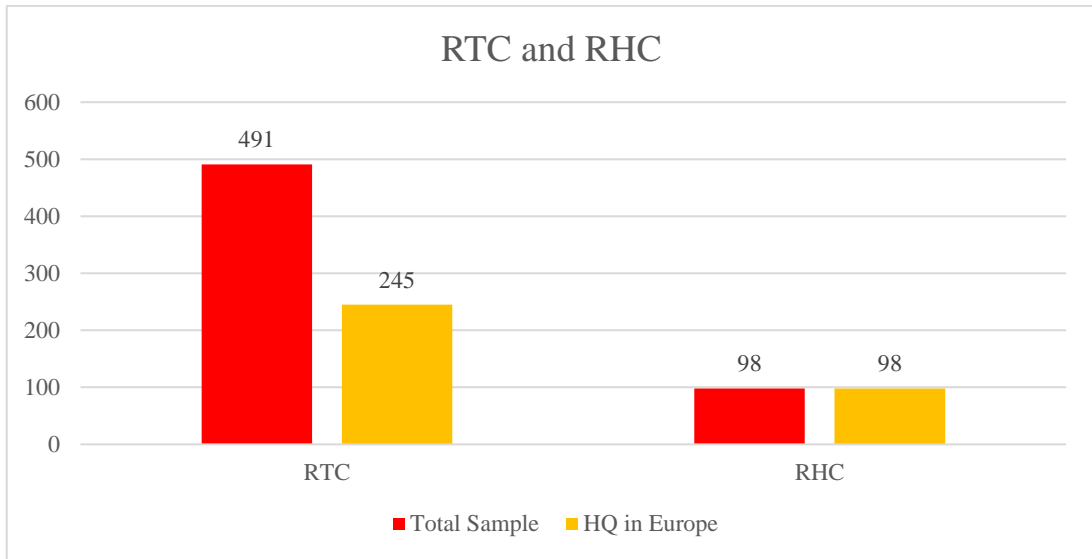


Figure 10 - Dependent variable distribution

Going more in depth we can observe how the majority of relocations come from France, Great Britain, Germany, Belgium, Italy and Sweden both in term of RTC and RHC. This show that the most developed economies in Europe lost several companies respect to those in the eastern part. In particularly France and Great Britain suffered more, with 70 firms which previously offshored in their territory that decided to delocalise in a new third country.

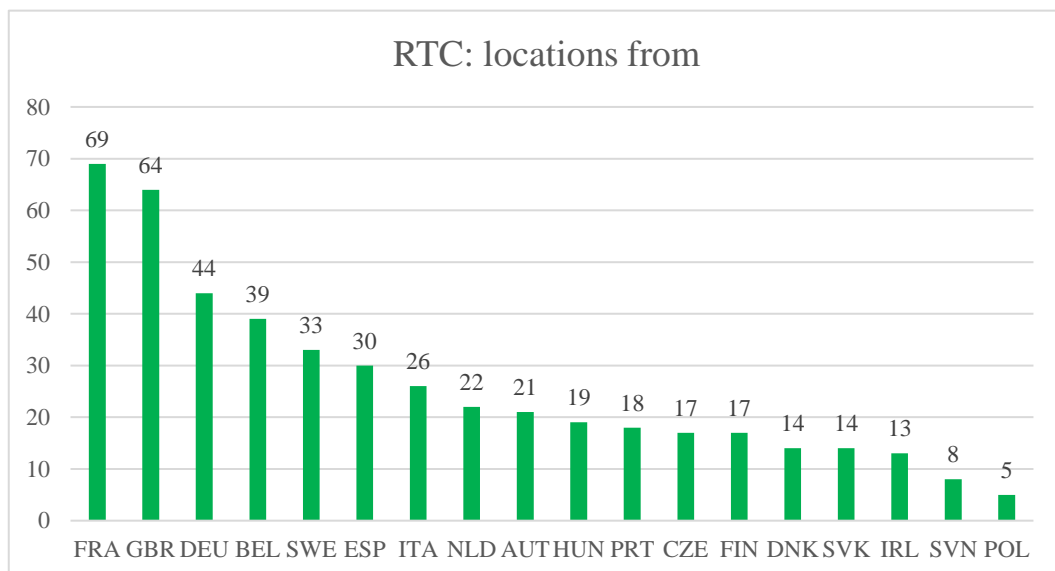


Figure 11 - RTC locations from

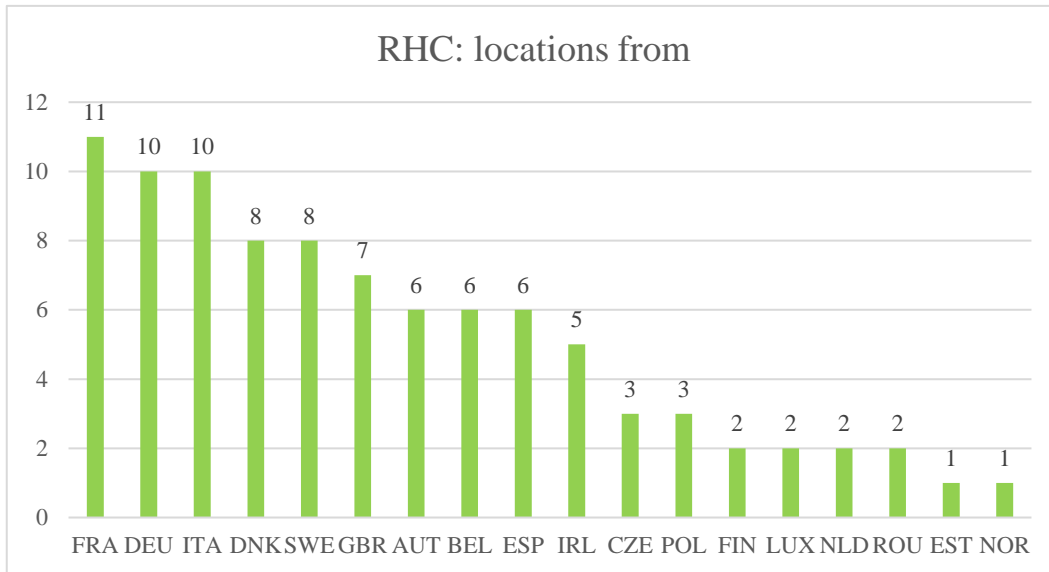


Figure 12 - RHC locations from

Regarding the destinations of the relocations, there is instead a clear distinction between RTC and RHC. In the first case, as shown in the coloured maps (figure 13), eastern countries are preferred, probably because offer lower cost of production and lower labour cost. So, as explained by theory, companies for which the drivers is cost efficiency, may continue to delocalise their plants and production, and in this perspective country as Czech Republic, Romania and Poland are the most appealing ones, with this latter that attracted 104 relocations of production activities (17% of all RSD in the sample).

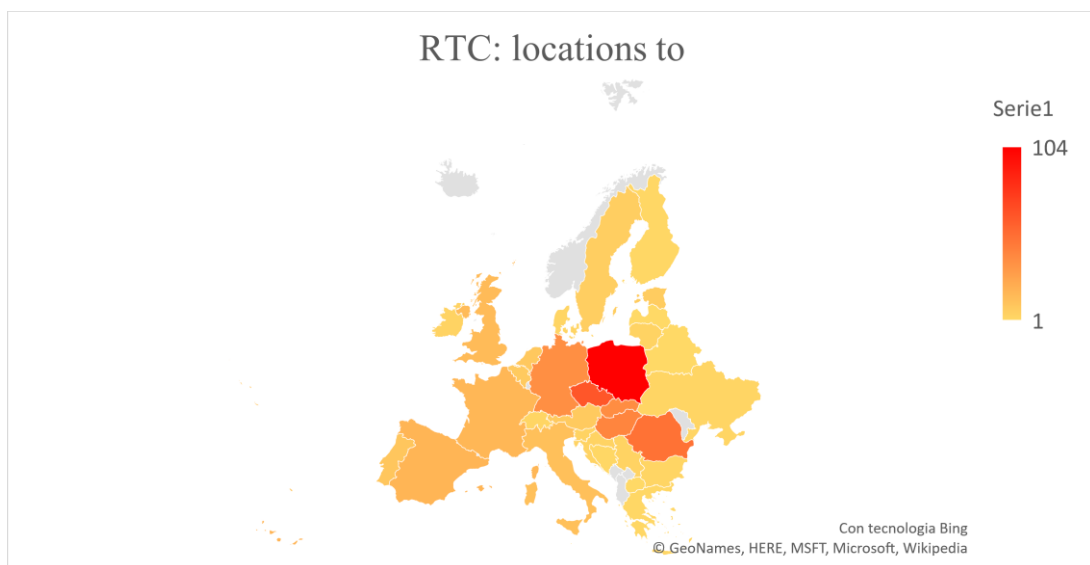


Figure 13 - RTC locations to

When companies decided to back-reshore (RHC), the movements are more concentrated on the western part of Europe. This is first due to the fact that in our database, the majority of country A are western countries but also because these countries were the first, to implement policies that foster repatriation of firms.

In particular, one of the policies that increased the incidence of repatriation in the last year was Industry 4.0 (Ancarani & Di Mauro, 2018). The first nation that developed this action was Germany and probably is not a case that shows the higher number of repatriation, with 7 cases out of 27 (25%) after the announcement of the Industry 4.0 plan (2011).

Finally, the case of Spain is interesting since this is the only western country with 18 cases of RTC but none of RHC.

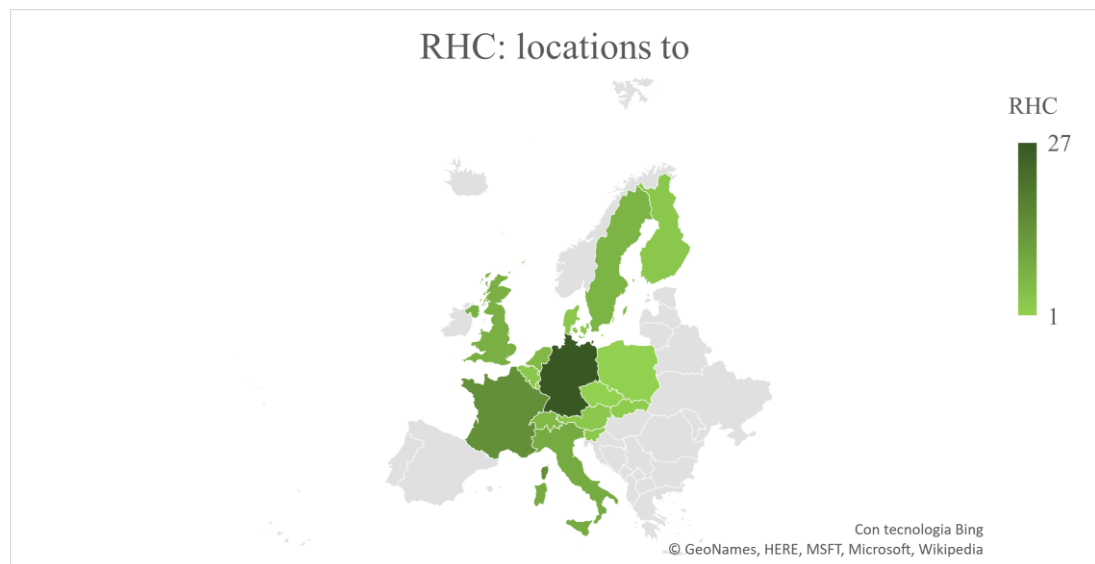


Figure 14 - RHC locations to

3.4 - Time distribution

The announcement year of the relocations in the database cover the span from 2002 to 2018. What we can observe is that the evidences of RTC are always higher than those of RHC. The peak of RTC was in 2006, few years after the enlargement of the European Union of 2004 that necessarily increase the options available to firms for their delocalization.

Important is also to notice that between 2009 and 2010 RTC decreased from

40 to 14 and RHC decline from 15 to 6. This was probably due to the financial crisis that caused a great recession in Europe and in USA during that years. Usually during period of economic recession firms tend to increase the relocations of production from their country to a foreign one, searching better conditions but the crisis that started in 2008 was so strong and widespread that almost all European countries were damaged and more likely enterprises decided to reduce the FDIs, concentrating production in few plants. Further starting from 2011 RSD increased again but without reaching the previous levels.

In case of European firms results are quite similar, with a peak in 2006 and a reduction of relocations after the financial crisis. RHC are always lower than RTC except in 2009 with 15 cases for both.

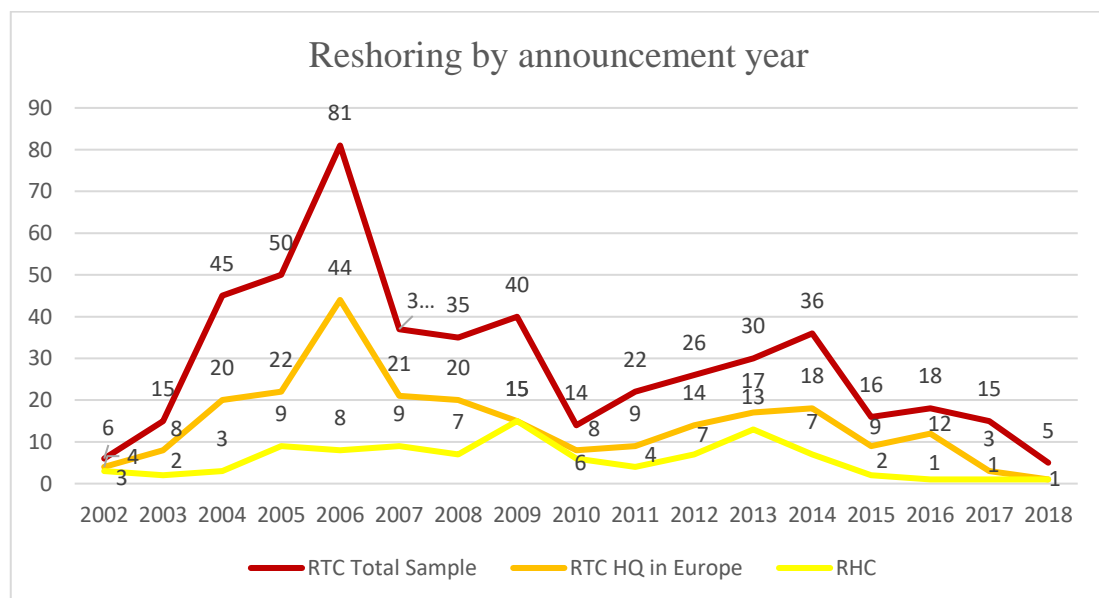


Figure 15 - Time distribution of the phenomenon

3.5 – Sectors

We analyzed the impact of reshoring on the different manufacturing sectors, using the 2-digit *NACE (rev. 2) classification*. This descriptive statistics allow us to understand what are the sectors more involved in such kind of production movements.

NACE code 29 (*Manufacture of motor vehicles, trailers and semi-trailers*) is the most active both in RTC and RHC followed by NACE code 26 and NACE code 10, that include respectively companies manufacturing *computer, electronic and*

optical products and *food products*. This is probably the results of the fact that these industries previously offshored several production activities, in particularly automotive industries in the last decades was one of the most active in offshoring production.

Making a comparison of RTC and RHC by sectors, we observed a predominance of RTC in all the industries. None of the firms belonging to NACE 19 (*Manufacture of coke and refined petroleum products*) was involved in the reshoring of production. For European companies the highest number of RTC was observed instead in the *electrical equipment* industry (NACE 27), while the other sectors showed the same trend of the whole sample.

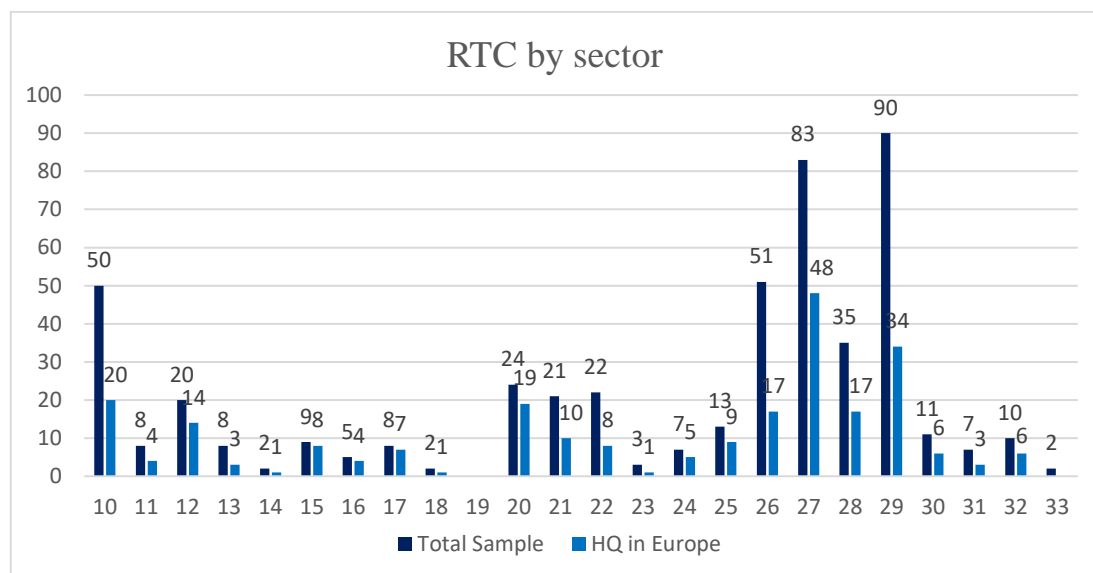


Figure 16 - RTC by industrial sector

Focusing on RHC some sectors as *manufacture of wearing apparel* (NACE 14), *manufacture of wood and of products of wood* (NACE 16), *printing and reproduction of recorded media* (NACE 18) did not show any evidence in this respect, while in the sectors of *manufacture of chemicals and chemical products* (NACE 20), RHC represent a good percentage of reshoring movements, more than the half of RTC cases.

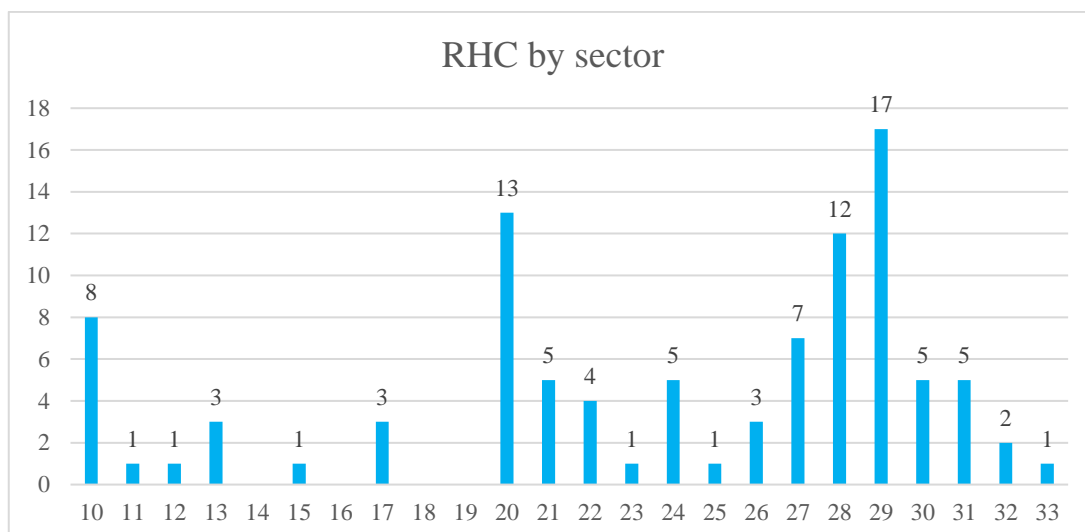


Figure 17 - RHC by industrial sector

3.5.1 - High tech vs Low tech sectors

We investigated also whether there are some difference in the phenomenon of reshoring among high and low tech sectors. We consider the *High-tech aggregation by NACE Rev.2 by Eurostat* that divide the 24 manufacturing sectors accordingly to their technological intensity (measured as $\frac{\text{R\&D expenditure}}{\text{Value Added}}$) in four groups: *high-tech*, *medium-high tech*, *medium-low tech* and *low tech* (as shown in table 4).

Manufacturing Industries			NACE Rev. 2 codes – 2-digit level		
High-tech	21 26	Manufacture of basic pharmaceutical products and pharmaceutical preparations; Manufacture of computer, electronic and optical products			
Medium-high tech	20 27 to 30	Manufacture of chemicals and chemical products; Manufacture of electrical equipment; Manufacture of machinery and equipment n.e.c.; Manufacture of motor vehicles, trailers and semi-trailers; Manufacture of other transport equipment			
Medium-low tech	19 22 to 25 33	Manufacture of coke and refined petroleum products; Manufacture of rubber and plastic products; Manufacture of other non-metallic mineral products; Manufacture of basic metals; Manufacture of fabricated metals products, excepts machinery and equipment; Repair and installation of machinery and equipment			
Low tech	10 to 18 31 to 32	Manufacture of food products, beverages, tobacco products, textile, wearing apparel, leather and related products, wood and of products of wood, paper and paper products, printing and reproduction of recorded media; Manufacture of furniture; Other manufacturing			

Table 4 - Technology Intensity Index by industry

Considering the first two groups respectively as more high tech and the last two as more low tech we observed that 377 RSD (64%) refer to high tech companies, that are the majority of our dataset. Focusing in particular only on firms with headquarters in Europe the results are quite similar, with high tech firms representing the most of the observations (62%).

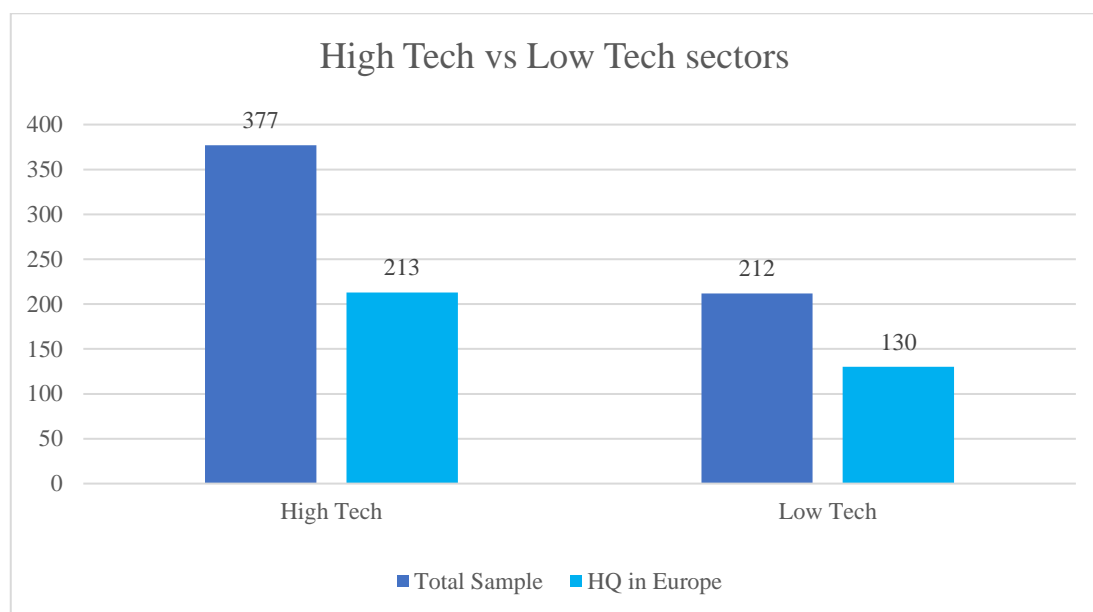


Figure 18 - High Tech vs Low Tech sectors distribution

3.5.2 – Outsourcing Propensity

In some sectors outsourcing is more frequent than in other, so in order to understand the distribution in the database it was used for each sectors an index calculated as $\frac{\text{Total purchases of goods and services (€)}}{\text{Turnover (€)}}$, according to what literature suggests (Quèlin 2003; Ricciardi 2011; Marchegiani *et al.*, 2013). The industries in which the value was above the median are considered with a higher propensity of outsource production respect those below. 68% (402 cases) of companies that reshored production activities manufacture products in sectors with a higher propensity of outsourcing. The sub-sample of enterprises headquartered in Europe confirms this trend, with 67% of firms in outsourcing propensity sectors.

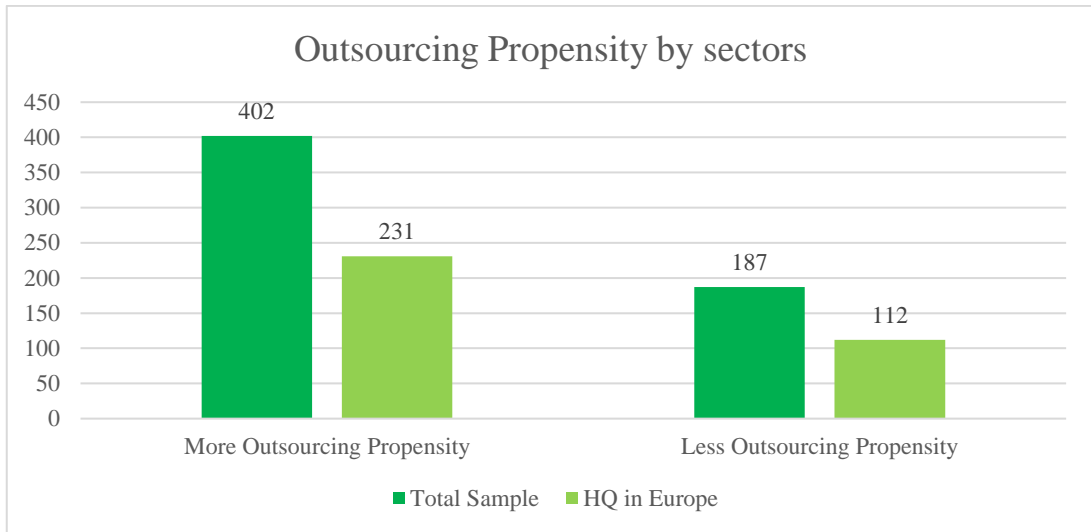


Figure 19 - Outsourcing propensity by sectors distribution

3.5.3 - Capital Intensive vs Labour Intensive sectors

We distinguished also the impact of reshoring between capital and labour intensive sectors. A good proxy of capital intensity is $\frac{\text{Gross investment in tangible goods (€)}}{\text{Persons employed}}$, (Kapoor, 2016), thus the sectors were divided in two groups: those above the median as more capital intensive and those below as more labour intensive. Sectors characterized by higher capital intensity are those with higher cases of reshoring (55% and 323 cases). Considering only firms with HQ in Europe the results are the same (53% and 183 cases).

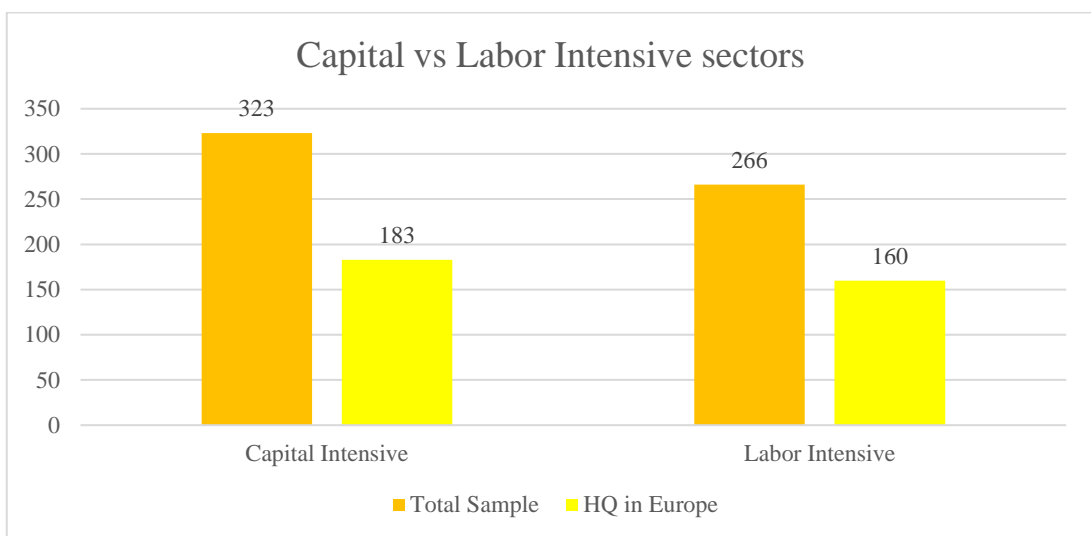


Figure 20 - Capital intensive vs Labor intensive sectors distribution

3.5.4 – RTC and RHC by sector indicators

In this section, we turn our attention to the relationship between the key industrial characteristics and the probability of undertaking a relocations to home country (RHC) operation instead of a relocation a to third country (RTC). Consistent with the entire research, we identify as relevant sectoral characteristics, the propensity to outsourcing, the technological level and the intensity of capital.

In particular, the analysis, carried out characteristic by characteristic, is made up of two different parts. The first step consists of ordering in an increasing way the sectors, based on the indicator taken into consideration. The second one lies to compute the percentage of RHC on the total observations of the sector, and the percentage of RTC on the total observations of the sector. Given the hypotheses formulated in chapter 2, we expect, for all three characteristics, an increasing trend of the RHC curve and decreasing for RTC. This to reflect the hypothesis that the higher the propensity to outsourcing, capital intensity and technological level the greater the incidence of RHC that should be recorded.

This analysis is carried out taking into account the sub sample of European companies, to avoid the imbalance between RTC operations, that counts EU and non-EU companies, and the RHC operations, that counts only EU companies. Moreover, sectors with less than 4 observations were excluded from the analysis, to avoid that they could distort the final perception of the result.

Surly this kind of approach have a limited accuracy. There might be firm specific reasons that lie outside this framework, or multiple country, industry and firm specific characteristics coexist. Therefore, aware of the limits, a preliminary analysis is carried out with the aim to better understand the link between industry characteristics and RSD operations.

Specifically, the three indicators used in this analysis, which reflect the outsourcing propensity, the capital intensity and the level of technology are the following:

- *Outsourcing propensity*: the ratio between the *Total purchases of goods and services* and the *Turnover* of the sector (Data Eurostat);

- *Capital intensity*: the ratio between the *Gross investment in tangible goods* and the *Person employed* of the sector (Data Eurostat);
- *Technology level*: the ratio between the *R&D expenditure* and the *Value Added* of the sector (Data Eurostat).

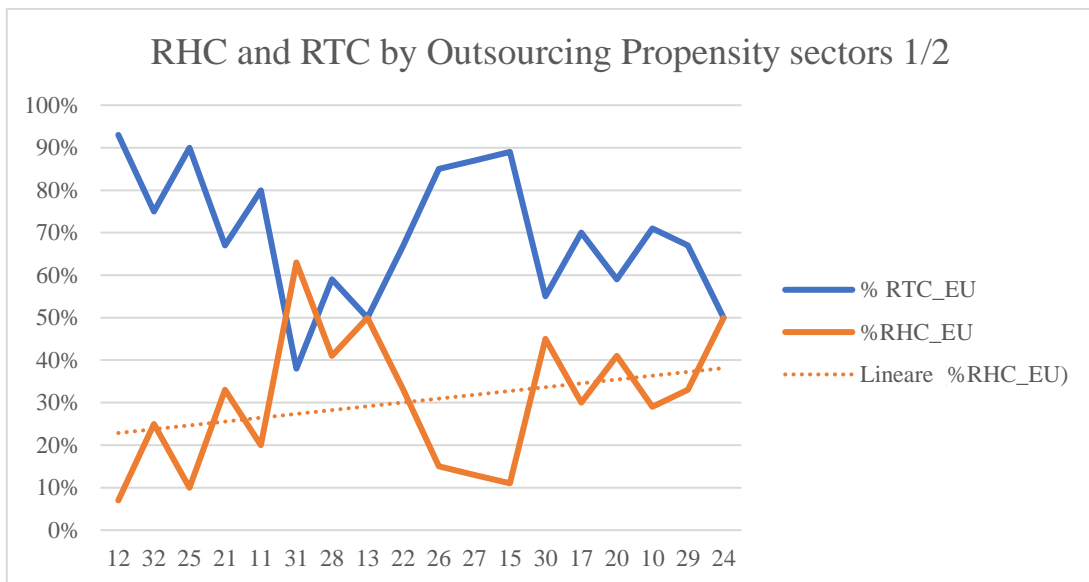


Figure 21 - Comparison of RHC and RTC by outsourcing propensity sectors 1/2

As mentioned above, the sectors (horizontal axis) are increasingly ordered, according to the *Outsourcing propensity* indicator, sector 12 registers the lowest value, while 24 the highest. That is to say, that is assumed that sector 12 is the one with the lowest propensity to outsourcing, while sector 24 is the most inclined. The linear trend, highlighted by the dashed line, marks, coherently with our initial hypothesis, a linear increase in the percentage of RHC operation, and a parallel decrease in the percentage of RTC, when the *Outsourcing propensity* indicator increases.

The sectors that distort the analysis, and do not allow us to provide a cleaner view of the relationship, are sectors 26, 27 and 31. As will also be seen for the other two indicators, these three sectors constitute an exception to the trend. Eliminating them temporally from the analysis, it is possible to show a more encouraging and clearer trend, which support and reinforce the hypothesis.

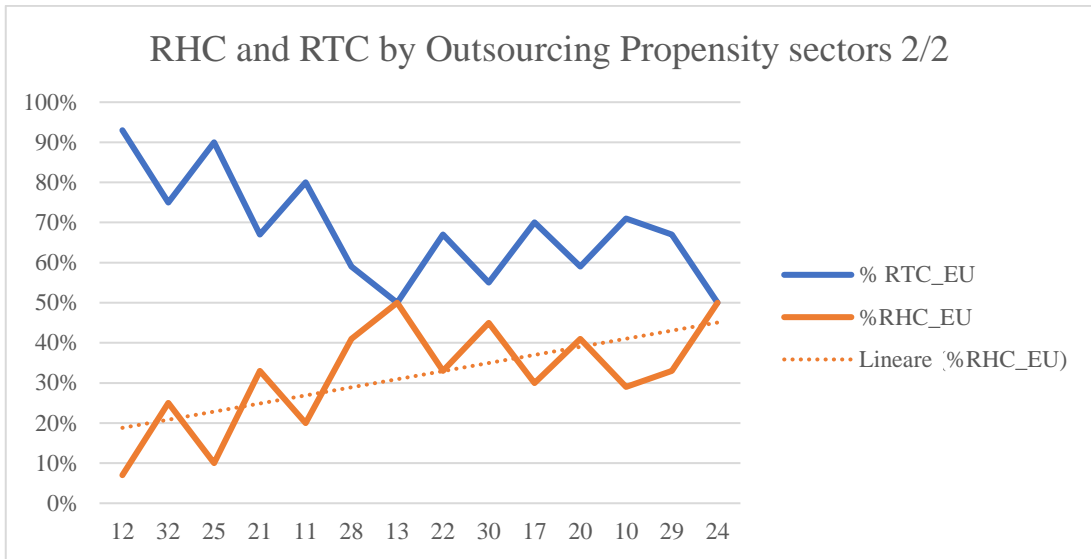


Figure 12 - Comparison of RHC and RTC by outsourcing propensity sectors 2/2

Repeating the same analysis for the second indicator, *Capital intensity*, the results obtained, are, again, in line with the initial hypothesis, that in sectors with high capital intensity there would be a higher percentage of RHC than RTC.

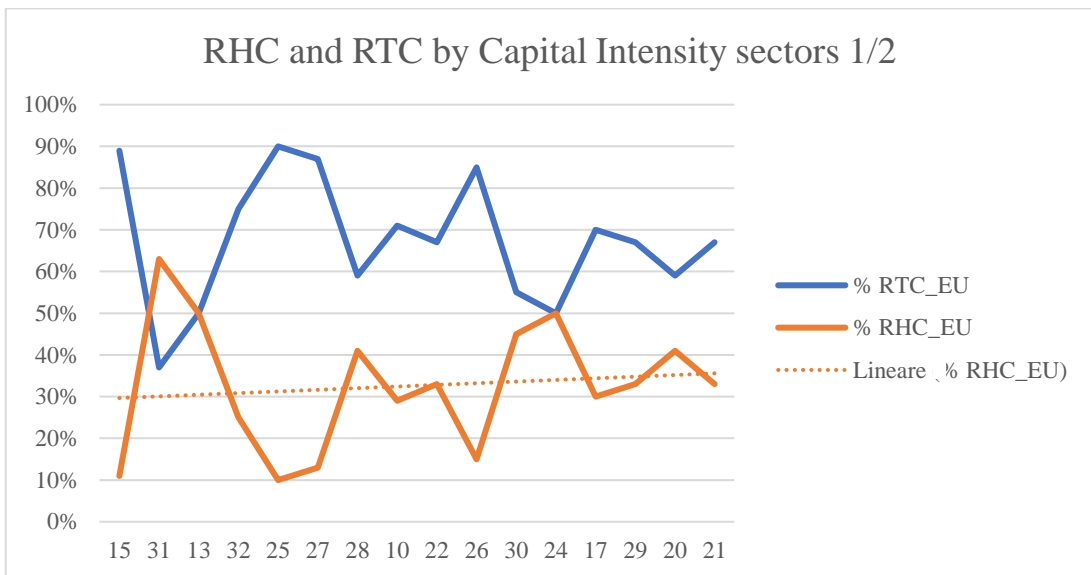


Figure 23 - Comparison of RHC and RTC by capital intensity sectors 1/2

In this case, however, the linear trend is positive, but much less marked than in the previous case. Going, also here, to eliminate the sectors 26, 27 and 31, which cause the distortion of the trend, a more marked and clear increase in the data is obtained.

It is possible to conclude, that also in this case, the number confirm our initial idea. Thus, in sector high capital intensive, the probability of undertaking a RHC is higher than a RTC.

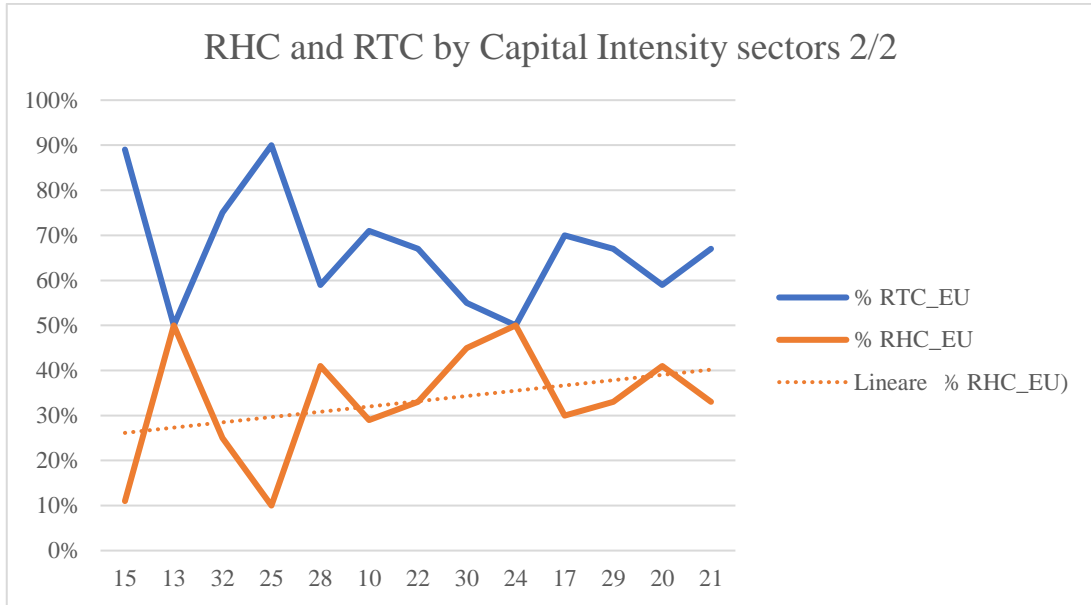


Figure 24 - Comparison of RHC and RTC by capital intensity sectors 2/2

Finally, the results of the tech-level confirm, also in this case, the hypothesis that in high-tech sectors there would be a greater propensity to RHC and RTC operations.

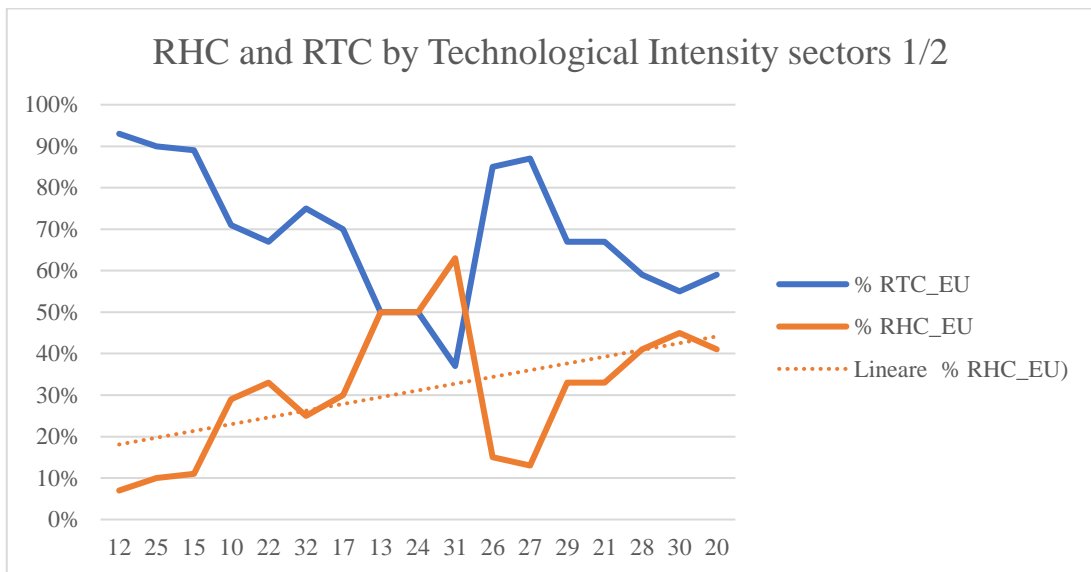


Figure 25 - Comparison of RHC and RTC by technological intensity sectors 1/2

And also in this case the sectors 26, 27 and 31 are the ones that distorts the desired positive growth trend. By eliminating these three sectors only temporarily, the result is strengthened.

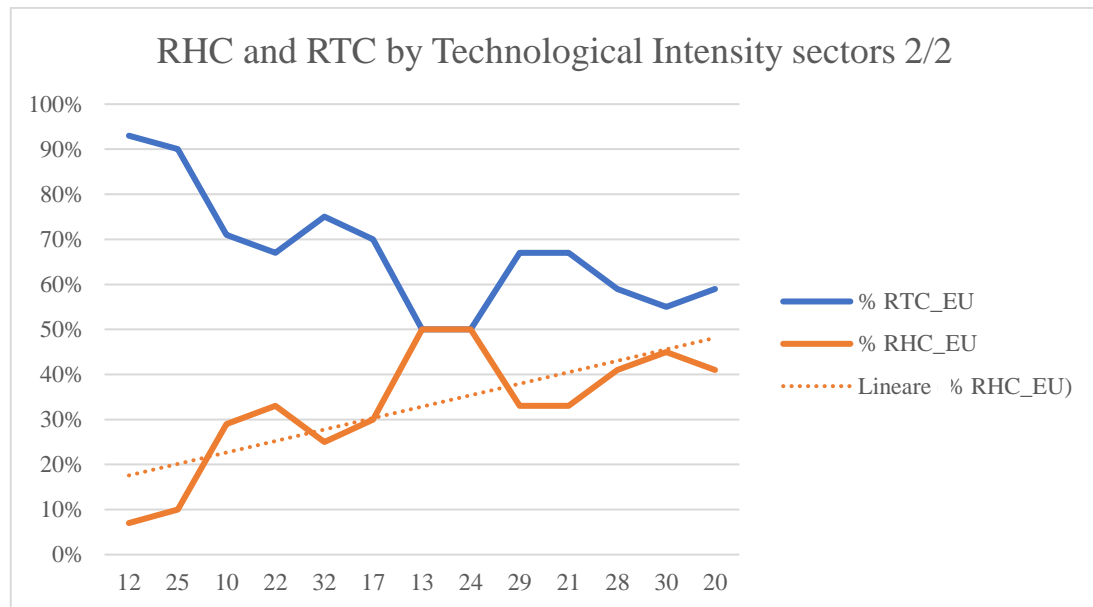


Figure 26 - Comparison of RHC and RTC by technological intensity sectors 2/2

In conclusion, it can be stated that all three hypotheses announced and described in the previous chapter seem to be confirmed by this first and approximate analysis.

However, it is necessary to further investigate and understand the reasons behind the non-linear behaviours of sectors 26, 27 and 31. As for sector 31 “*Manufacturer of Furniture*”, which records 5 RHCs on 8 RSDs, a possible explanation can be found in the limited number of observations, only 8, made by only 5 different companies. A possible hidden explanation is the existence of firm specific features that our model fails to highlight, and that the limited number of observations amplifies.

Sectors 26 and 27, “*Manufacture of computer, electronic and optical products*” and “*Manufacture of electrical equipment*”, instead count respectively 20 and 55 observations, with only 3 and 7 RHC operations. In both sectors, all the operations appear to be very similar, marking 85% of the cases moving to an Eastern European country. Therefore, it is supposed the existence of others drivers and industry-specific

characteristics and specific context, that are not considered in this first and approximate analysis, and that may weigh heavily in preferring an RTC operation instead of RHC.

3.6 – Firm-level analysis

To conclude this first part of our descriptive analysis, we shift the perspective from a country and sector level to a firm level, trying to highlight major trend and differentiate company behavioural patterns. The dataset counts 117 companies with two or more RSD operations; hence, it is possible to gather them in a table and perform a comparative analysis to cover most relevant factors underlying the RSD decision. Specifically, the ten most active companies per number of observations are listed in the following table.

Firm	NACE	TOT	RHC	RTC	Tot Employee reduction
Kraft Foods	10	14	0	14	1592
Delphi	27	11	0	11	3627
Unilever	10	10	3	7	1201
Electrolux	28	9	1	8	1927
Philips	27	7	0	7	1397
Bosch	29	7	1	6	1693
Continental	29	6	2	4	1281
Henkel	20	5	1	4	276
Mars	10	5	0	5	600
Yazaki	27	5	0	5	1950

Table 5 - Top 10 firms for RSD

Therefore, a first attempt it is performed to recall the different incidence of the RTC with respect to the RHC on the total number of RSD and the respective most preferred destination. As it emerges from the data, Kraft Foods, Delphi, Philips, Mars and Yazaki have undertaken only RTC-type relocations, while Unilever and Continental have the highest number of RHC-type relocations. The analysis suggests a routine and repetitive behaviour implemented by these companies, which further underlines the existence of common drivers that guide their choices.

The most selected destination for this top-ten is Poland, which is also Kraft Foods' favourite destination. Below, there is Hungary, which is the most chosen destination for Delphi and Bosch. Other outstanding countries are Slovakia, Czech Republic and Romania. This evidence suggests, again, the crucial role played by the Eastern expansion of the European Union in 2004 and 2007.

The impact on employment, reported in the last column of the table, records, obviously, all results (except for Henkel) far beyond the dataset average, that is equal to 262 employees per RSD operation (figure 27). It should be emphasized, however, the difference between European and non-European companies, and, also, that when looking at the ten companies registered for the greatest number of reduced employees, there is none of the company present in our table. This suggests a weakening of the belief that the higher the number of RSD the more negative the impact on employment will be.

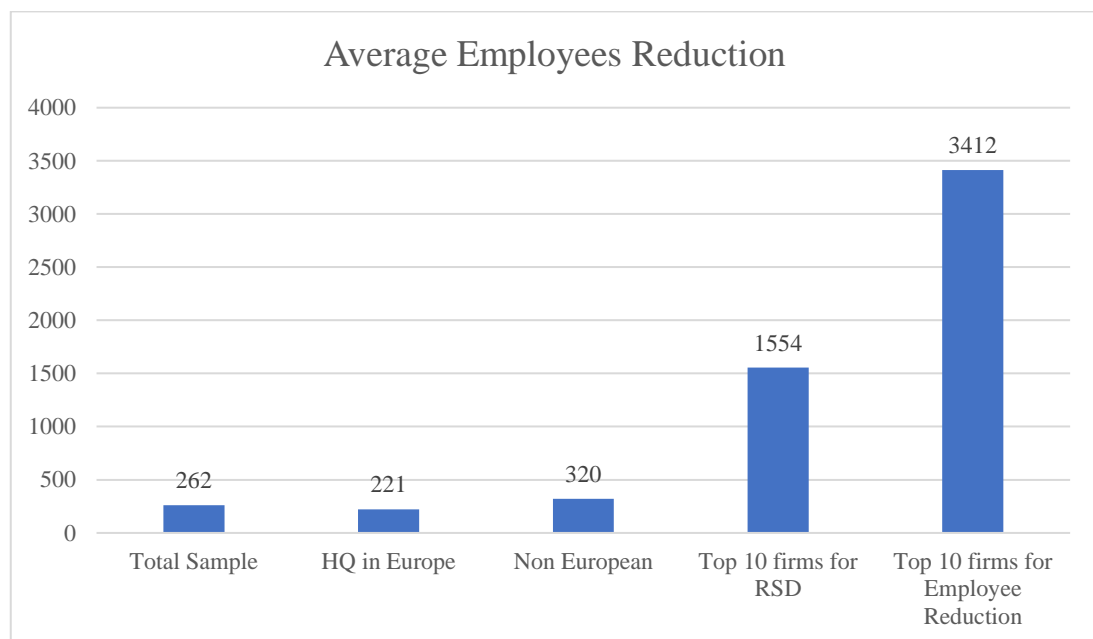


Figure 27 - Average Employees Reduction

Focusing on the underlying sector, it is recorded that 6 companies out of 10 operates in high-tech sector, 8 companies out of 10 operates in sector with a high propensity of outsource production and 3 companies out of 10 operates in sector defined capital intensive. If we add to these results a more in-depth analysis, we note how the companies that have undertaken only RTC, and so Kraft Foods, Delphi,

Philips, Mars and Yazaki, are all companies operating in sectors that, according to our definition, we can describe as labour intensive and with a high propensity of outsource production.

Finally, to conclude the analysis, we look at the firms that are recorded for the larger number of relocations to home country (RHC). Therefore, it is noticed that the large part of them have performed only RHC operations. The most active in this pattern is Alstom, with three RHC out of the four RSD operations in the dataset. Volkswagen, Arla, Takao, Thyssenkrupp, Renault and Lonza performed two RSD operations and all of them towards their home country (RHC).

3.7 – Macroeconomic indicators

This part of descriptive statistics is conducted with the aim of outlining some interesting insights that might be helpful to explain how the targeted locations have changed over time. A worldwide analysis of the most relevant variables is performed, taking as a reference period the years between the 1997 and the 2016. Given the purpose that this thesis aims to pursue, the analysis of macroeconomics indicators is concentrated on the major European countries, as well as on the European countries present in greater number in the dataset, in order to understand possible traits that affect the choices of the firms when implementing a relocation of second degree.

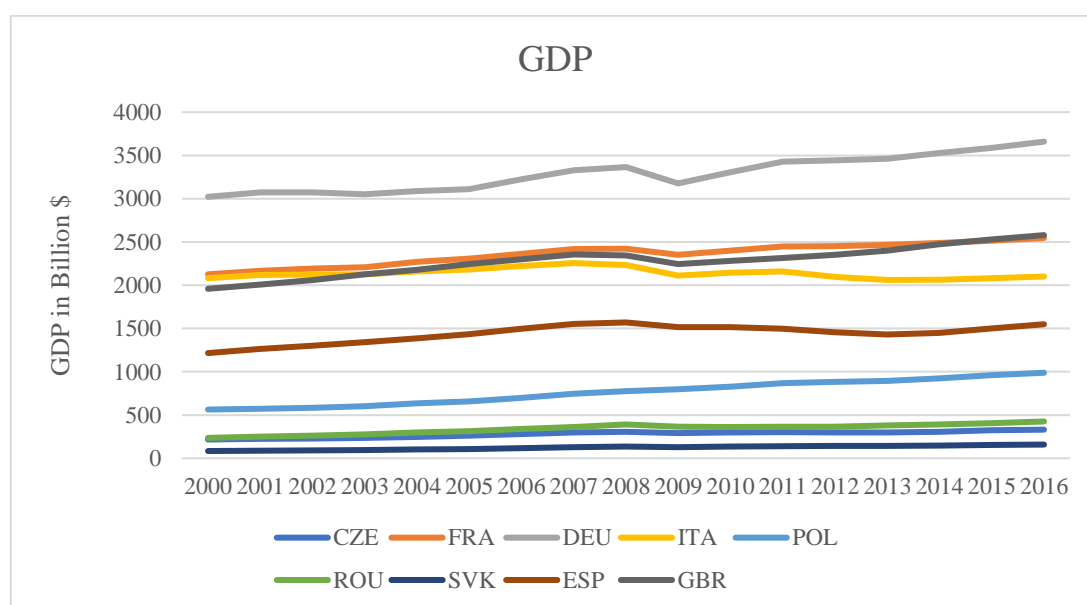


Figure 28 - GDP variation between 2000 and 2016. Source: World Bank

The trend of GDP allows us to build an initial idea about the expansion or contraction of markets. What emerges in figure 28 is that a positive growth trend characterized all the selected country, with the only exception of Italy, that instead shows a slight decline of the value in the last years. Germany remains the most growing economy in Europe, with Great Britain and France following and often switching relative position. But what immediately catches the attention is the distance between western and emerging economies. Indeed, the worst results are recorded by Poland, Romania, Czech Republic and Slovak Republic. These economies are moving together consistently. There have not been big changes in the equilibrium of these economies in terms of growth and relative positions. Therefore, taking into account only this type of information, it is impossible to trace a plausible underlying cause for the change in the targeted country selection.

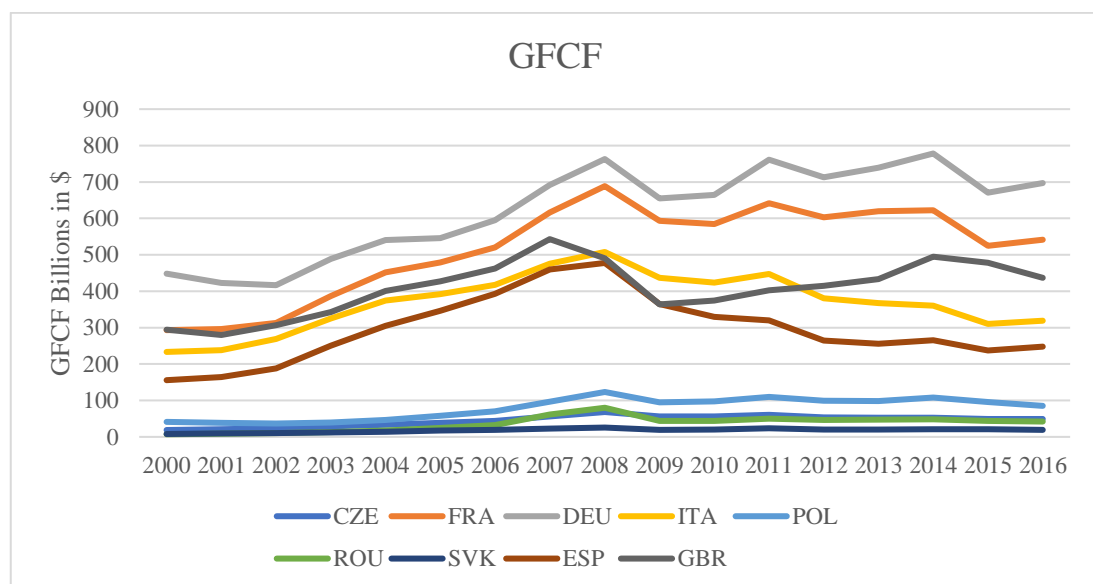


Figure 29 - GFCF variation between 2000 and 2016. Source: World Bank

Gross Fixed Capital Formation measures the value of acquisitions of new or existing fixed assets by the business sector, governments and “pure” households, less disposal of fixed assets. It’s then a good proxy of how much investments in assets are made in a certain country. Also in this case it is possible to notice a strong gap between industrialized countries and emerging economies. Western European countries move compact and consistent, but with multiple fluctuations. Some countries seem to suffer most from the effects of the crisis, Italy and Spain especially. The Eastern European

countries, instead, after the 2007/2008 pick are able to limit the declining phase and to stabilize the GFCF on a constant trend. Therefore, what emerges is basically that the financial crisis penalized both Eastern and Western economies, but the first seem not to be involved in the downturn in the same marked way. As a consequence, the latter became favourable field of investments.

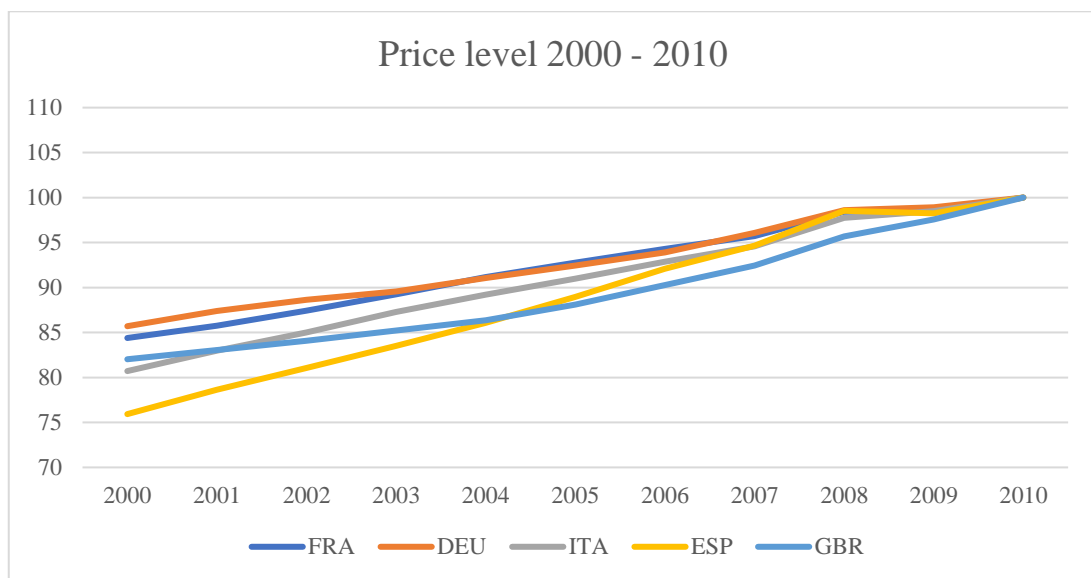


Figure 30 - Price level variation between 2000 and 2010. Source: World Bank

The price level variable is created in relation to the bundle value in 2010 in each of the selected country. For this reason, all the lines intersect the value 100 at year 2010. It is necessary, therefore, to focus on the slope of each curve to understand the differences between country. Also in this case we can notice a difference in the pattern between Western and Eastern economies. Nevertheless, all the economies analysed move compact and consistent. However, some interesting deviation must be highlight. In particular, shown in the chart above, after 2002 the growth trend of price level shows a marked slope for Germany, France and Italy and Spain. The reason is the adoption of the Euro as a national currency. Other countries, like Great Britain, who never left their currency, show a lower growth rate in the period 2000 - 2010.

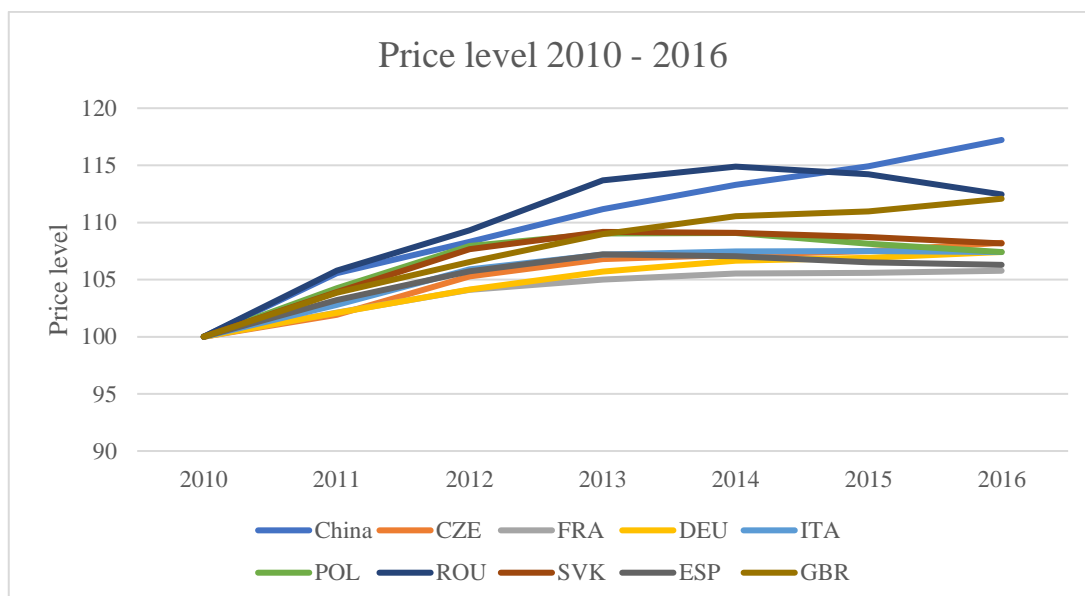


Figure 31 - Price level variation between 2010 and 2016. Source: World Bank

The chart focuses on the 2010-2016 period, to better show the most recent dynamic. During these years the economies seem to be almost aligned, with physiological differences from country to country, in a moderate range. However, a more accurate analysis shows that after an initial phase of growth of the price level in all the selected countries, starting from the 2013/2014 the difference between Western and Eastern countries comes out again. In particular, Italy, Germany, France and Great Britain continue to show a positive growth of the price level, while Romania, Czech Republic, Slovakia and Poland begin to record a decrease in price level. Therefore, these data suggest that preference in investments between Western and Eastern countries in Europe should have changed also due to price level trend.

Moreover, we can go deeper in the analysis, and thus we introduce also China in the sample, to have an international benchmark, and to better explain some dynamics in the selection of the “third country”. Indeed, all the emerging European economies had and still have a significant gap in terms of price level growth with China, which continues to show a strong increase. This comparison strengthens the belief that is becoming more convenient for Western European countries to invest in Eastern European countries rather than in economy like China, also considering the geographic and cultural distance.

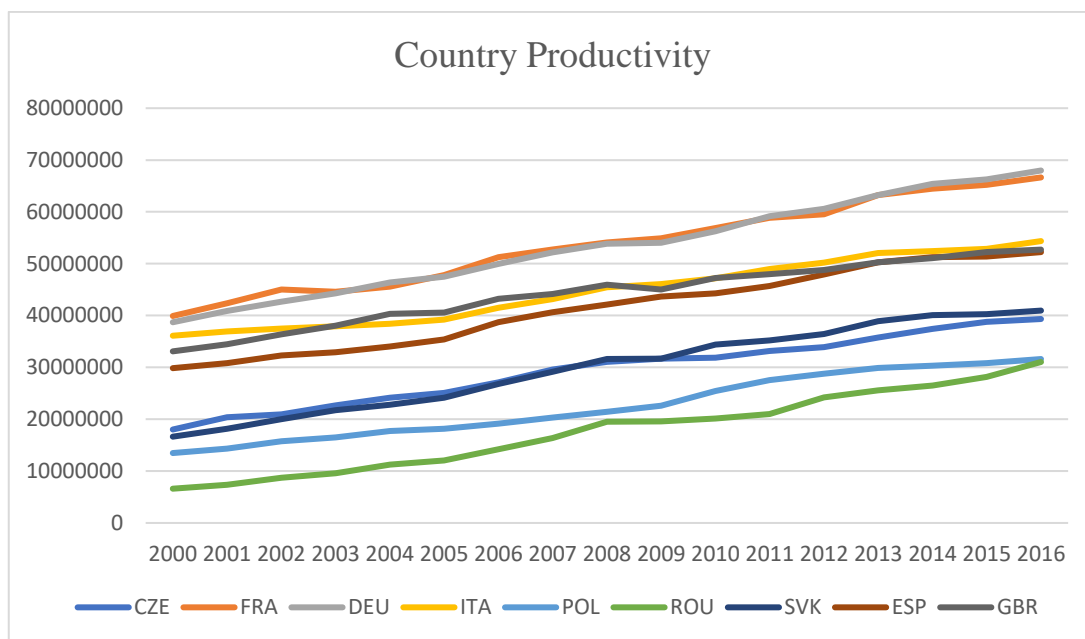


Figure 32 - Country productivity variation between 2000 and 2016. Source: World Bank

The trend of the productivity index (calculated as $\frac{GDP \text{ in US\$ at PPP}}{\text{Hour worked}}$) follows, for all the country, a similar and consistent growth trend, with a physiological difference due to country-specific factors. The analysis is performed building the variable *productivity* as the ratio between *Gross Domestic Product* and the *yearly amount of working hour*, country by country, year by year. No major shocks emerge from the analysis, no changes of relative position of the countries, and a positive pattern is highlighted.

It is clear that some emerging countries have evident margins of improvement in terms of productivity, however some economies grow stronger than others (see Romania, +285%). Thus, it implies that in a long-term perspective these countries are more attractive for efficiency seeking investments. To give a quantitative reference, the whole sample of selected countries shows, on average, a 98% increase in productivity in the 2002-2016 time period. But if we split the sample in Western versus Eastern economies, an interesting result emerge. The Western countries records a +55% of increase, while the Eastern countries shows a +148% of increase in productivity. This strengthens the above said.

3.8 – Drivers for the first relocation

In order to investigate the main drivers behind each relocation of second degree, an empirical analysis based on country characteristic is conducted. The underlying hypothesis is that it is possible to correlate the decision to move from a country to another with differences in some key decisional factors. Thus, all the observations, in which a positive delta (calculated as a mere difference) is recorded in key variables between home and host country results, are selected. And, finally, it is supposed that the drivers which record the highest percentage (i.e. number of positive deltas respect to the total number of observations) could be considered as the predominant reasons behind the offshoring decision.

Surly this kind of approach have a limited accuracy. There might be firm specific reasons that lie outside this framework, or multiple country and firm specific scope coexist. Therefore, aware of the limits, a preliminary analysis is carried out with the aim to better understand the motivation behind RSD.

Specifically, the four drivers used in this analysis, which reflect the location advantages of the first host (with respect to the home) country underlying the initial offshoring investment are the following:

- *Strategic asset-seeking location advantage.* The delta between the first host country and the home country of the Researcher in R&D per million people;
- *Cost-saving location advantage.* The delta between home country and first host country in the Unit Labour Cost (based year 2010=100);
- *Market seeking location advantage.* The delta between host and home country GDP per Capita in US\$ at Purchasing Power Parity, Constant 2011;
- *Productivity location advantage.* The difference between the first host country and the home country in the ratio GDP per person employed in US\$ at Purchasing Power Parity.

The results are summarized in the following chart.

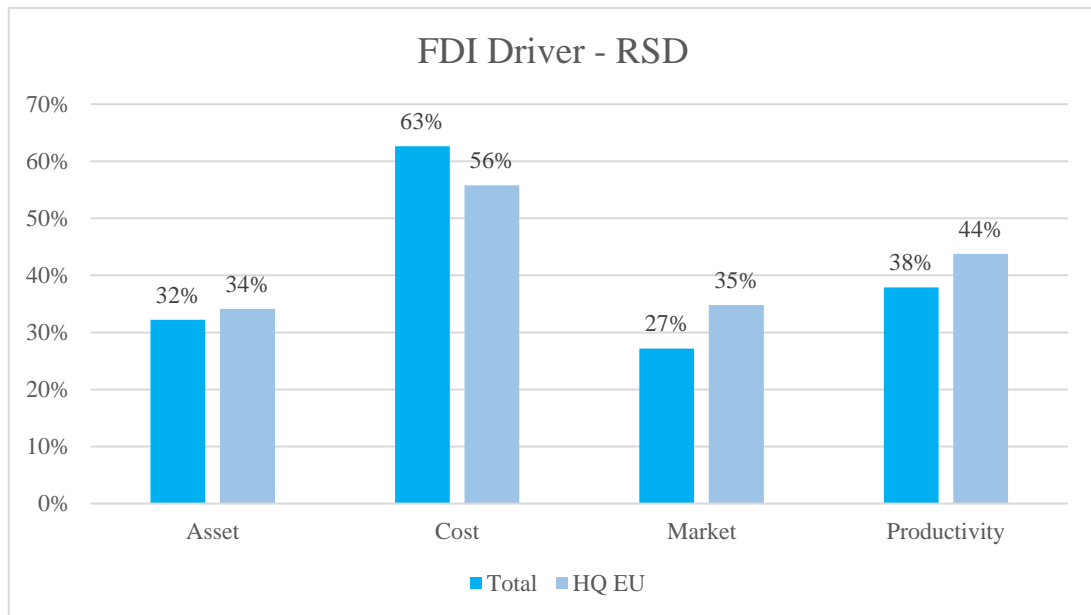


Figure 33 - RSD driver distribution

Cost-savings location advantage seems to be the most important driver for relocations, followed by productivity location advantage. However, it is necessary to remark that both labour cost reduction and high productivity are two aspects of the same strategic driver, that is efficiency seeking. Hence, accounting together, emerges clearly how the cost saving purpose is the main driver. Moreover, clearly appears an interesting distinction between European companies and the total of the sample. In particular, companies located in Europe seem more directed, also, towards the search for a market seeking location advantage.

Furthermore, an in-depth analysis is conducted to understand if difference exists between the two type of relocations of second degree.

Concerning return to the home country, cost continues to be the driver most commonly associated to the observation. However, it is important to stress how in this case the percentage incidence of market and asset increase compared to the analysis performed to the entire dataset, moving from 26% and 32% to 31% and 37%, respectively.

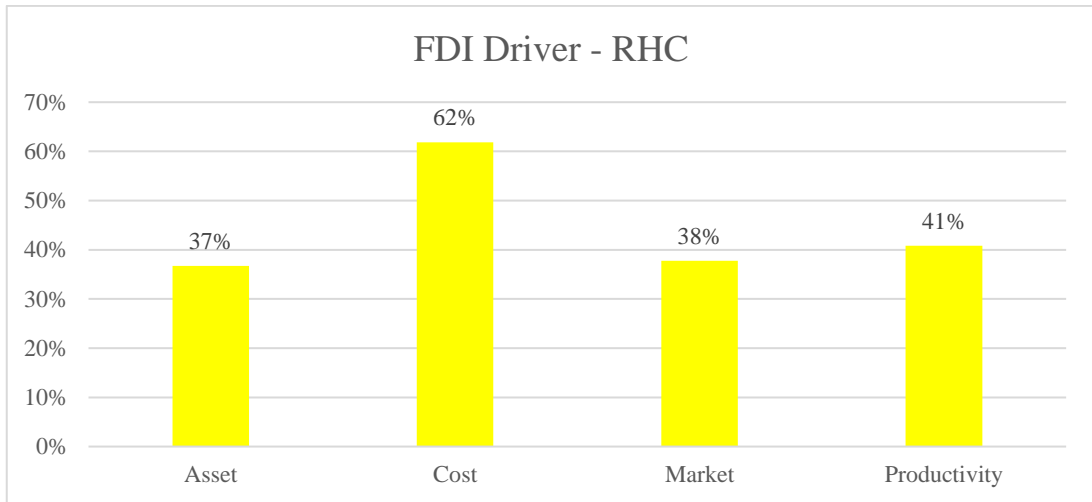


Figure 34 - RHC driver distribution

By performing the same type of analysis on the RTC observation sub-sample, the result is, again, a predominance of efficiency-seeking drivers. The percentages of the observations in which the deltas of costs and productivity are positive, are equal to 63% and 37% of the total of the RTC operations. But, what appears immediately clear, is the marked difference between European and non-European companies. Among European companies, clear and widespread is the search for countries in which to find better conditions of productivity and market, compared with the total RTC sub sample. Therefore, compared to RSD complete sample analysis, there are no evidence that aggregate Efficiency Seeking have less or more weight on RHC rather than on RTC. Indeed, all the drivers analysed appear more or less in line with the total RSD result.

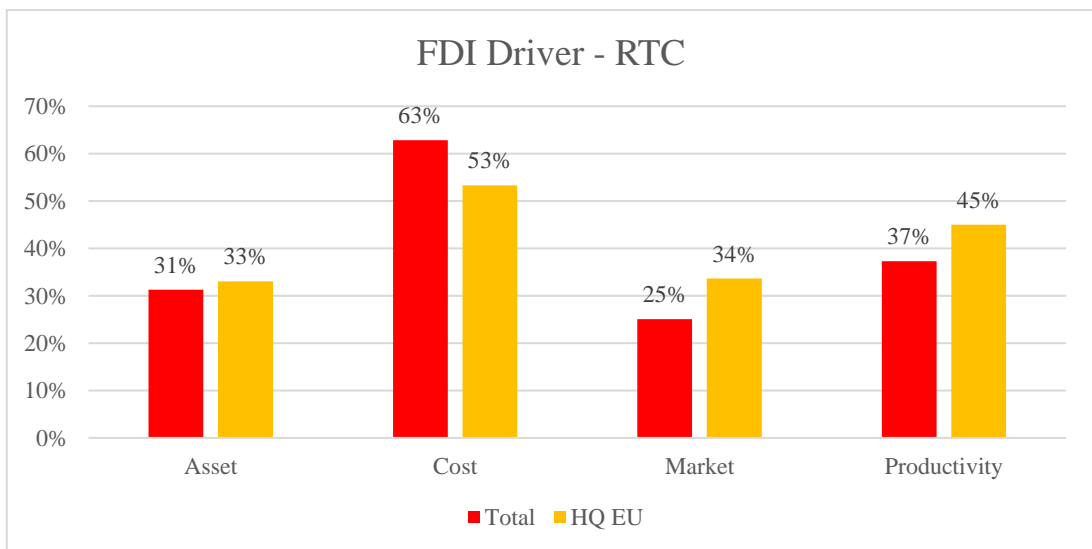


Figure 35 - RTC driver distribution

Finally, it is interesting to analyse what happens in the company that have undertaken more than one relocation of second degree. In particular, it is analysed if the drivers pursued in the first operation (in a chronological way) are pursued also in the following RSD. In 34% of cases company decided to leverage on different drivers, which confirms the trend that companies sometimes try to follow different strategies in order to pursue other objectives and goals. Still 66% of the companies, that undertake more than one relocation, exploits the same drivers of the first offshoring decision, moving to a new country to better embrace the advantages they were looking for. Therefore, these companies prefer to choose consistently with the past strategy of the company.

To conclude the descriptive statistic, an in-depth comparative analysis is performed, to highlight the relationship between the type of RSD and the FDI drivers at a firm-specific level. Therefore, the two most active companies in the RTC and RHC fields are selected: Kraft Foods, with 14 RTC operations out of 14 RSD operations, and Alstom, with 3 RHC operations out of 4 RSD operations.

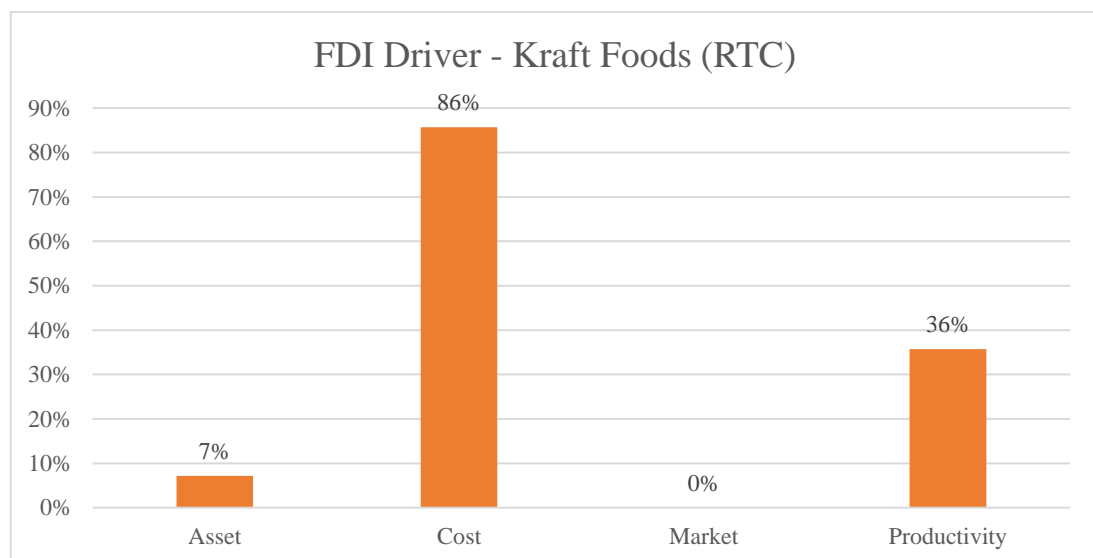


Figure 36 - Kraft driver distribution

What emerges, once again, is that in the choices of RTC operations it is clear the systematic behavioural patterns of the companies, which look for countries in which to benefit from an increase in efficiency. And, for Kraft Foods, especially in a reduction of unit labour cost.

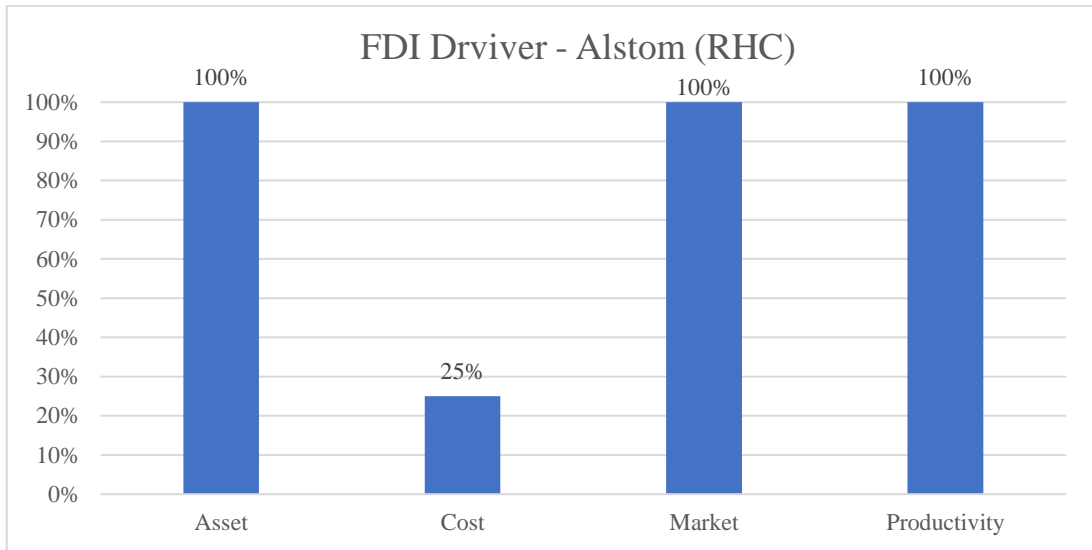


Figure 37 - Alstom driver distribution

Analysing Alstom, and therefore the reasons behind the decisions of RHC, it emerges that the company, returning to its home country shows, in all the operations, an increase of the value for the variable *strategic asset-seeking location advantage*, *market seeking location advantage*, *productivity location advantage*. The results show a completely different trend than the values recorded for Kraft Foods. This suggests that to weigh in the RHC operations there are completely different reasons compared to the drivers that guides the RTC choices.

CHAPTER IV

Econometric analysis

The database used for the econometric analysis is provided by the European Restructuring Monitor dataset for reshoring cases between 2002 and 2015, and by the European Reshoring Monitor dataset for reshoring cases occurred between 2015 and 2018. Both these datasets include data concerning the EU28 Member States and Norway, considering relocations that meet at least one of the following criteria: (1) *it affects at least one European country*; (2) *it involves a reduction of at least 100 workers and* (3) *it involves at least 10% of the workforce in sites with more than 250 employees*. The database is composed of 589 observations, but due to a partial coverage of data, the analysis is based on 263 observations. For this reason we test if the sample of the econometric analysis is representative using five variables of the model, and four of these variables, showed that the sample is representative (see the annex II for further details).

4.1 - Definition of the variables

4.1.1 - Dependent variable

The dependent variable of the Probit model is a binary variable modelling the RSD (*Relocation of second degree*) decision. More specifically, the variable is called RHC (*Relocation to the home country*) and assumes the value 1 if a firm implements an RHC operations. Contrary, if a company conducts a RTC operations, the variable is set to 0. In the dataset, the RHC cases are 42 whereas the RTC cases are 221.

4.1.2 - Explanatory variables

Three explanatory variables are identified to reflect the industrial aspects discussed in section 2.3: *Outsourcing Propensity*, *Capital Intensity* and *Technological Intensity*. The variables are described in detail in the following paragraphs¹.

Outsourcing propensity

A variable representing the propensity of outsourcing the industry is constructed. The ratio between *Total Purchase of goods and services (€)* over the *Total Turnover (€)* is used as a proxy for the degree of outsourcing of the specific industry (Quèlin 2003; Ricciardi 2011; Marchegiani *et al.*, 2013).

The data are gathered from the sectoral database provided by Eurostat, which collects data aggregated among EU28 firms in the years from 2011 to 2017. Then for each manufacturing sector (*NACE 2-digit* from 10 to 33) is computed the ratio of the punctual yearly value of each of the seven years (from 2011 to 2017). Finally, a simple average is performed. The value obtained is used as a proxy of the outsourcing propensity of the industry (see figure 38). Given the discussion in the literature review section, a positive correlation between the propensity of outsourcing and the willingness to relocate in the home country the production activities is expected.

The industry that outsource more, according our indicator, are *Manufacture of basic metal* (NACE 24), *Manufacture of coke and refined petroleum products* (NACE 19), *Manufacture of motor vehicles, trailers and semi-trailers* (NACE 29) while *Manufacture of tobacco products* (NACE 12) has the lower value.

¹ Given that some variables express numbers with different units of measure and various orders of sizes, standardization is used to obtain more homogeneous values of variables

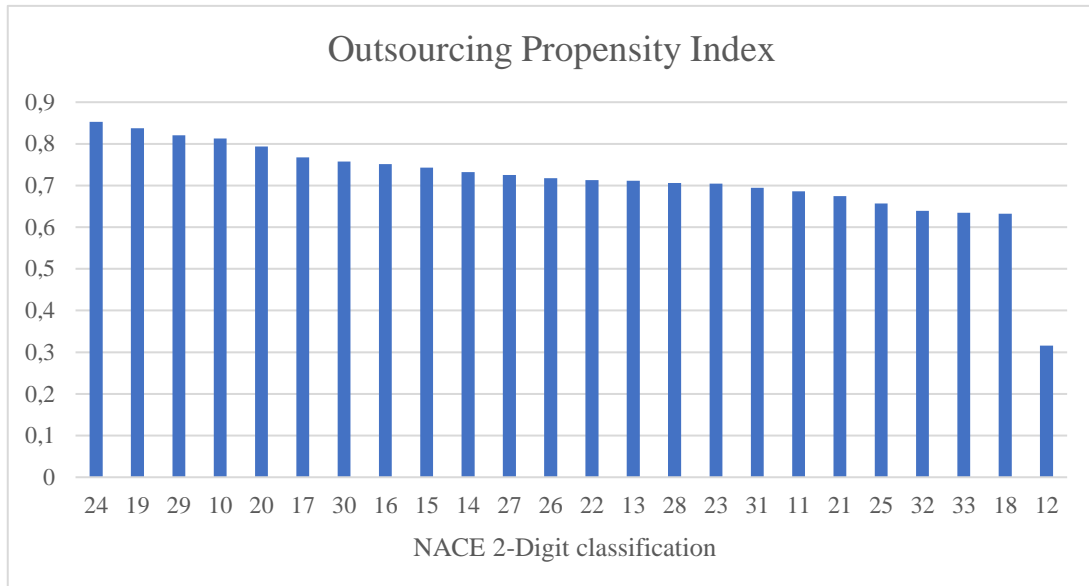


Figure 38 - Outsourcing propensity by Industry

Capital intensity

The second explanatory variable refers to the capital intensity of the industry. Various measures are adopted in literature in order to estimate the level of capital and labour intensity. The most used are fixed capital or fixed assets of a company respect to the persons employed in the organization (Kapoor, 2016). Thus, an indicator similar to what scholars suggests is used as proxy: the ratio between *Gross investment in tangible goods (million €)* over the *Number of persons employed*. As previously explained, also in this case the data are gathered from the database provided by Eurostat, that collect aggregated data of EU28 firms by sectors between 2011 and 2017. Following a similar approach explained above the seven-year average of capital intensity index is obtained (see figure 39).

Given the discussion in the literature review section, a positive correlation between the capital intensity and the willingness to relocate in the home country the productivity activities is expected. *Manufacture of coke and refined petroleum products* (NACE 19), *Manufacture of tobacco products* (NACE 12) and *Manufacture of basic pharmaceutical products and pharmaceutical preparations* (NACE 21) are the sectors more capital intensive according while *Manufacture of wearing apparel* (NACE 14) and *Manufacture of leather and related products* (NACE 15) appear more

labour intensive and this is in line with what generally different scholars states about the distinction of capital and labour intensive sectors (Dachs, 2014).

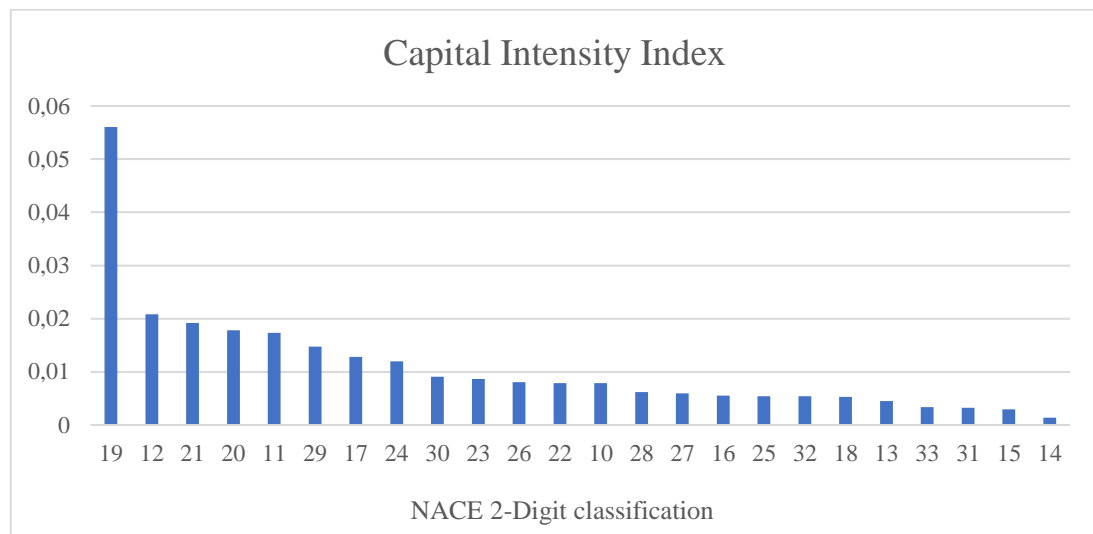


Figure 39 - Capital Intensity Index by industry

Technological intensity

The last explanatory variable regards the technological intensity of the sector. In this case several measures are indicated in literature, but one of the most solid is *R&D expenditure over Output* (Palda, 1986). A very similar one, *R&D expenditure over Value Added*, is used by Eurostat in order to identify the industries technological intensity but in this case, the European institute provide only an aggregation of the manufacturing industries based on NACE Rev. 2 at 2-digit level. The manufacturing sectors are classified in four sub-categories: *High technology*, *Medium-high technology*, *Medium-low Technology* and *Low Technology* (for clarity it is shown again the table of section 3.5.1).

Thus, a ranking is given, when each sector is classified belonging one of the four sub-categories. Coherently, the index is built as a scale from 1 to 4, where 1 is assigned to *low technology* sector and 4 to *high technology* sector.

Given the discussion in the literature review section, a positive correlation between the level of technology and the willingness to relocate in the home country the productivity activities is expected.

Manufacturing Industries		NACE Rev. 2 codes – 2-digit level
High-tech	21 26	Manufacture of basic pharmaceutical products and pharmaceutical preparations; Manufacture of computer, electronic and optical products
Medium-high tech	20 27 to 30	Manufacture of chemicals and chemical products; Manufacture of electrical equipment; Manufacture of machinery and equipment n.e.c.; Manufacture of motor vehicles, trailers and semi-trailers; Manufacture of other transport equipment
Medium-low tech	19 22 to 25 33	Manufacture of coke and refined petroleum products; Manufacture of rubber and plastic products; Manufacture of other non-metallic mineral products; Manufacture of basic metals; Manufacture of fabricated metals products, excepts machinery and equipment; Repair and installation of machinery and equipment
Low tech	10 to 18 31 to 32	Manufacture of food products, beverages, tobacco products, textile, wearing apparel, leather and related products, wood and of products of wood, paper and paper products, printing and reproduction of recorded media; Manufacture of furniture; Other manufacturing

Table 6 - Technology Intensity Index by industry

4.1.3 – Control Variables

In addition to the explanatory variables, that represent the factors driving a relocation, other variables are introduced as controls, since they may affect the choice for a RSD. These control variables consider different aspects: the drivers of the offshoring decision, the characteristics of the firms, the period in which the relocation decision took place, the cultural distance, the origin and the currency adopted by the first host country.

Here the description of all the control variables adopted.

Market seeking

The variable used as drivers for the *market seeking* factors is the difference between host and home country GDP per Capita in US\$ at Purchasing Power Parity (Constant 2011)² and is called *Offshoring Market Driver*. This variable is constructed as the average of the difference between punctual values in the three years before the announcement year of the RSD operation. The purpose of the variable is to define to what extent a country may result more attractive than another one in terms of market opportunity, since the level of the GDP of a specific country can be considered as a good proxy of the possibility to enlarge the market in the country under analysis.

² Source: World Bank Data, <https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD>

Strategic-asset seeking

This control variable captures the role of the *strategic asset-seeking* factors and is measured as the difference between the first host country and the home country number of researchers in R&D per million people³. Also, in this case, the variable is the simple average of the difference of the punctual value in the three years prior to the announcement's year of the relocation. The *Offshoring Asset Driver* is used with the aim to identify if a country is more attractive than another, due to the specific assets, knowledge, synergies it offers.

Efficiency seeking

The efficiency seeking factor is based on two sub factors, namely the *cost reduction* and the *productivity enhancing* advantage. The variables, called *Offshoring Cost Driver* and *Offshoring Productivity Driver*, are calculated respectively as the difference between home country and first host country in the Unit Labour Cost, based year 2010=100⁴, and as the difference between the first host country and the home country in the ratio GDP per person employed in US\$ at Purchasing Power Parity⁵. As already explained both the efficiency seeking indicators are calculated as the average of the difference of the punctual values in the three years before the announcement year of the reshoring decision.

Crisis 2008 -2011

In order to evaluate the effects of the economic crisis in 2007-2008 on the relocation decisions the dummy *Crisis 08-11* is introduced. The objective is to capture the distinction between relocations announced during this period and those proclaimed before or after. The variable assumes the value 1 if the relocations was declared during this interval, and 0 otherwise.

³ Source: World Bank Data, <https://data.worldbank.org/indicator/SP.POP.SCIE.RD.P6>

⁴ Source: OECD Data <https://data.oecd.org/lprdy/unit-labour-costs.htm>

⁵ Source: World Bank Data <https://data.worldbank.org/indicator/SL.GDP.PCAP.EM.KD>

Eastern first host country

Regarding the reshoring destinations, is used a dummy aiming to identify the subset of first host country. In particular, *Host1 East-EU*, distinguish if the first host country belongs to the Eastern Europe. Specifically, Eastern Europe countries are: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Serbia, Slovak and Slovenia. The variable assumes the value 1 if the country belongs to the list above, otherwise is 0.

Euro currency in the first host country

A control variable is set in order to evaluate if the first host country belongs to the Euro area. The countries where Euro is the currency adopted are: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, Spain. The variables *Host1 Euro-Currency* is set equal to 1 if the country uses Euro as currency and 0 otherwise.

Cultural Distance

Relocations of production activities are often affected by the cultural distance between home and host country. The variable *Cultural Distance* aims to capture cultural differences and was built using the Dow & Karunaratna (2006) index which is composed by several dimensions: Language, Industrial Development, Democracy and Religion. It is supposed that higher is the distance in term of culture, higher is the tendency to implement a relocation of second degree.

Size of the firm

The number of employees of the firm are used to measure the size of the company. This control variable is important in order to understand if the behaviour of the firms in performing a delocalization is affected by the dimensions, since large enterprises can rely on a higher number of resources to implement their internationalization strategies, including the RSDs. The data are gathered by Orbis –

Bureau van Dijk database, and it is computed as the average of the total number of employees for the timespan of investigation. In the model, the variable is labelled *Firm Size*.

Patent stock of the firm

Finally, a control variable was introduced to comprehend if patents regarding Industry 4.0 technologies have a role in the relocation decisions that the firms have decided to put in practice. This variable is used as reference for the level of innovation of the company. Data are gathered from the Global Patent Index (GPI) database, provided by the European Patent Index and the variable denominated *Patent in FIR technologies* represents the stock of the application of Industry 4.0 patents for each company. More specifically, the values taken into consideration refer to the patents till the previous two years of the announced reshoring movement.

4.2 – Model setting

Given the binomial nature of *RHC variable (dependent variable)*, a clustered Probit model is performed to estimate the results. This is a regression model utilized when employing a ‘binary’ dependent variable, namely a dummy variable defined in the interval (0, 1). The purpose of the model is to estimate the probability that an observation, with particular characteristics, will fall into one of the identified categories.

The function is defined as:

$$probit(p) = \ln(p) - \ln(1 - p) = \ln\left(\frac{p}{1-p}\right)$$

Where \ln is the natural logarithm and $\frac{p}{1-p}$ is called odd, representing the ratio between the probability of occurrence of an event and the probability of non-occurrence of the same event. In figure 40 is shown the plot of the Probit function.

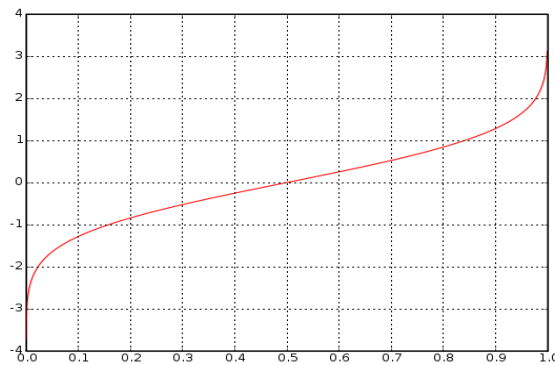


Figure 40 - Plot of the Probit function

The model is described by the equation:

$$P(y = 1|X) = \Phi(X^T \beta)$$

where $P(y = 1|X)$ denotes the probability of a positive outcome for the dependent variable, and the vector X represent the explanatory variables (observed characteristics). The Φ is the Cumulative Distribution Function (CDF) of the standard normal distribution, the parameters β , typically estimated by maximum likelihood, the estimated impact that the regressors have on the probability of a positive outcome.

4.3 – Empirical findings

Before testing the three hypothesis, we show the correlation matrix and the descriptive statistics in table 7.

Total Sample		Correlation Matrix													
		1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)
1)	RHC (Dependent Variable)	1.0000													
2)	Outsourcing Propensity	0.0839	1.0000												
3)	Capital Intensity	0.1069	-0.27641	1.0000											
4)	Technological Intensity	0.0983	0.2189	0.1187	1.0000										
5)	Offshoring Market Driver	0.2010	-0.3259	0.1941	-0.0088	1.0000									
6)	Offshoring Asset Driver	0.0453	-0.0956	0.0253	-0.0119	0.3560	1.0000								
7)	Offshoring Cost Driver	-0.0446	0.3415	-0.1341	0.1019	-0.3304	0.0422	1.0000							
8)	Offshoring Productivity Driver	0.0477	-0.3455	0.1818	-0.0501	0.8110	0.3533	-0.3058	1.0000						
9)	Crisis 08-11	0.0914	0.1002	-0.0811	0.0388	-0.1243	-0.0482	-0.0280	-0.1340	1.0000					
10)	Host1 East-EU	-0.0180	0.1432	-0.0922	-0.0266	-0.5052	-0.3479	0.1190	-0.6157	0.1169	1.0000				
11)	Host1 Euro-Currency	0.0002	-0.1900	0.2594	0.0713	0.2106	-0.2667	-0.3444	0.3372	-0.1133	-0.3385	1.0000			
12)	Patents in FIR technologies	0.0375	0.0820	-0.0266	0.1090	0.0678	0.0550	0.0706	-0.0043	0.0143	0.0340	-0.0185	1.0000		
13)	Cultural Distance	0.0360	0.0373	-0.0567	0.0248	0.0515	0.0965	0.0343	0.0250	0.0800	-0.0004	-0.1184	-0.0274	1.0000	
14)	Firm Size	0.0787	0.1833	-0.0138	-0.0049	-0.1818	0.0157	0.0976	-0.2002	0.0108	0.1682	-0.1394	0.1478	0.0124	1.0000
	Obs	263	263	263	263	263	263	263	263	263	263	263	263	263	263
	Mean	0.1596	-0.0163	0.2333	2.5551	-0.1361	-0.0322	-0.0104	-0.0901	0.2433	0.13307	0.6428	-0.0574	-0.0740	0.2257
	Std. Dev.	0.3670	1.1867	1.0285	1.0244	0.7596	0.8509	0.9724	0.9006	0.4299	0.3403	0.4801	0.8663	0.8871	1.1231
	Min	0.0000	-4.2919	-1.7520	1.0000	-2.3869	-2.0636	-2.9779	-2.5809	0.0000	0.0000	0.0000	-0.2964	-0.9882	-0.6170
	Max	1.0000	1.2045	2.0952	4.0000	2.9827	3.3911	3.9086	2.8942	1.0000	1.0000	1.0000	6.4455	3.5899	7.7966

Table 7 - Correlation Matrix and descriptive statistics

To check the possible existence of multicollinearity between the variables used in the model, the Variance Inflation Factor (VIF) is computed. The analysis of the multicollinearity excludes the presence of correlation between variables, reporting that there are no values with a variance inflation factor above the recommended threshold of VIF=10 (Hair *et al.*,1995).

Entering in the heart of the analysis, one model is developed to test the three hypothesis explained in the previous chapter.

Table 8 displays the results. Two over the three explanatory variables, i.e. *Outsourcing Propensity* and *Capital Intensity*, show a positive and significant ($p<0.05$) correlation with the dependent variable, meaning that firms operating in sector characterized by a high outsourcing propensity and by a high capital intensity are more likely to implement a relocation to home country rather than to a third country. These results confirm and support the hypothesis number 1 and 2, formulated above.

As regards the control variables, only the variables *Offshoring Market Driver* ($p<0.01$) *Offshoring Productivity Driver* ($p<0.05$) and *Crisis 08-11* ($p<0.05$) exhibit a significant coefficient. In particular, *Offshoring Market Driver* is characterized by a positive sign, meaning that firms looking for market advantages are more likely to

undertake an RHC. Conversely the *Offshoring Productivity Driver* shows a negative coefficient, meaning that a firm looking for productivity advantage prefers to undertake an RTC operations. Finally, *Crisis 08-11* display a positive coefficient, thus suggesting that firms investing abroad during crisis period are more likely to return home, rather than to relocating to third country, coherently to what suggested by previous studies.

All the other variables do not record statistically significant coefficient.

Variables	Model 1			
	Coef.	R Std. Err.	z	P> z
Outsourcing Propensity	0.230	0.110	2.08	0.037 **
Capital Intensity	0.209	0.104	2.01	0.045 **
Technological Intensity	0.078	0.103	0.76	0.449
Offshoring Market Driver	1.048	0.246	4.26	0.000***
Offshoring Asset Driver	-0.035	0.130	-0.27	0.788
Offshoring Cost Driver	-0.007	0.103	-0.07	0.943
Offshoring Productivity Driver	-0.427	0.210	-2.03	0.042 **
Crisis 08-11	0.430	0.206	2.08	0.037 **
Host1 East-EU	0.214	0.391	0.55	0.583
Host1 Euro-Currency	0.036	0.272	0.13	0.893
Patents in FIR technologies	-0.024	0.070	-0.34	0.732
Cultural Distance	0.005	0.115	0.05	0.960
Firm Size	0.096	0.100	0.96	0.337
Observations	263			
Wald Chi-Square	48.39			
Prob > Chi-square	0.000			
Pseudo R2	0.152			
Log pseudo-Likelihood	-97.845			

Table 8 - Results of the Probit Model [**p<0.10, **p<0.05, ***p<0.01*]

4.4 – Robustness Check: European Subsample

In order to reinforce the results obtained and shown in the previous paragraph, a robustness check is conducted.

The major weakness that could be advanced against the model is the use of a dataset that counts RTC observations of European and non-European companies, and RHC observations of only European companies. To avoid limitations and cancel the effects of this misalignment in the structure of the dataset, it was considered appropriate to proceed with a further econometric analysis, using a uniform subsample, which therefore counts only European companies. The number of observations is dropped from 263 to 149. The correlation matrix and the synthesis of the econometric analysis are reported in the tables below.

Total Sample		Correlation Matrix													
		1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)
1)	RHC (Dependent Variable)	1.0000													
2)	Outsourcing Propensity	0.1912	1.0000												
3)	Capital Intensity	0.0514	-0.3823	1.0000											
4)	Technological Intensity	0.1318	0.4155	-0.0183	1.0000										
5)	Offshoring Market Driver	0.0593	-0.3160	0.0952	0.0159	1.0000									
6)	Offshoring Asset Driver	0.0987	-0.1011	0.1497	0.0364	0.4084	1.0000								
7)	Offshoring Cost Driver	0.0109	0.4173	-0.0111	0.2283	-0.3368	-0.0473	1.0000							
8)	Offshoring Productivity Driver	-0.0185	-0.4035	0.1698	-0.0448	0.7678	0.3382	-0.3439	1.0000						
9)	Crisis 08-11	0.1342	0.1475	-0.1204	0.0510	-0.1613	-0.0476	-0.1318	-0.1443	1.0000					
10)	Host1 East-EU	-0.0394	0.1778	-0.1843	-0.1580	-0.6453	-0.3058	0.1773	-0.7369	0.1769	1.0000				
11)	Host1 Euro-Currency	-0.0562	-0.2460	0.2150	0.0310	0.2673	-0.1838	-0.1836	0.4190	-0.2242	-0.5137	1.0000			
12)	Patents in FIR technologies	0.0029	0.1172	-0.0565	0.0824	0.0190	0.1032	0.1759	-0.0440	0.0308	0.0410	-0.0862	1.0000		
13)	Cultural Distance	0.0526	0.0265	-0.0642	0.0729	0.1217	0.1342	-0.1039	0.0713	0.1158	-0.1342	-0.1695	-0.0264	1.0000	
14)	Firm Size	0.1234	0.1443	-0.0102	0.0340	-0.1074	0.0414	0.0570	-0.1684	0.0367	0.2692	0.1368	0.1976	-0.0497	1.0000
	Obs	149	149	149	149	149	149	149	149	149	149	149	149	149	149
	Mean	0.2818	-0.2315	0.3957	2.5771	0.1501	-0.0922	-0.1269	0.0339	0.2416	0.1409	0.6845	0.1196	-0.0733	0.1767
	Std. Dev.	0.4514	1.465	1.0923	0.9944	0.6710	0.9447	0.9879	0.8755	0.4295	0.3491	0.4662	1.1011	0.8652	1.2813
	Min	0.0000	-4.2919	-1.7520	1.0000	-1.8255	-2.0636	-2.9779	-2.2119	0.0000	0.0000	0.0000	-0.2964	-0.9882	-0.6170
	Max	1.0000	1.2045	2.0952	4.0000	1.5670	3.0049	2.2284	1.6565	1.0000	1.0000	1.0000	6.4455	3.3272	7.7966

Table 9 - Correlation Matrix and descriptive statistics of the European Subsample

The results obtained confirm and strengthen the previous analysis, confirming the idea that companies operating in sector high capital intensive and with a high propensity to outsourcing are more likely to undertake a relocation to home country, rather than to a third country. Namely that, among the explanatory variable, only the *Outsourcing Propensity* ($p < 0.05$) and *Capital Intensity* ($p < 0.1$) exhibit a positive and significant coefficient.

Also the evidence from control variable support and are in line with the result presented above. Only the control variable *Crisis 08-11* displays a positive and significant coefficient ($p < 0.1$).

Variables	Subsample HQ in Europe			
	Coef.	R Std. Err.	z	P> z
Outsourcing Propensity	0.285	0.123	2.32	0.020***
Capital Intensity	0.190	0.114	1.67	0.095*
Technological Intensity	0.041	0.115	0.36	0.718
Offshoring Market Driver	0.369	0.263	1.40	0.161
Offshoring Asset Driver	0.071	0.141	0.51	0.612
Offshoring Cost Driver	-0.073	0.126	-0.58	0.562
Offshoring Productivity Driver	-0.165	0.244	-0.68	0.498
Crisis 08-11	0.404	0.240	1068	0.092*
Host1 East-EU	-0.204	0.614	-0.33	0.739
Host1 Euro-Currency	-0.051	0.340	-0.15	0.879
Patents in FIR technologies	-0.054	0.080	-0.68	0.497
Cultural Distance	0.017	0.139	0.13	0.900
Firm Size	0.103	0.103	1.00	0.315
Observations	149			
Wald Chi-Square	28.15			
Prob > Chi-square	0.008			
Pseudo R2	0.097			
Log pseudo-Likelihood	-79.93			

Table 10 - Results of the Probit Model [**p*<0.10, ***p*<0.05, ****p*<0.01]

4.5 – Additional evidence

After analysing the correlation between relocations of second degree and the three industry dimensions, a second step was introduced in order to understand the connection of the productivity driver with the three explanatory variables.

In particular the attention was focused on the efficiency seeking driver, because we noticed that both the control variables *Offshoring cost driver* and *Offshoring Productivity Driver* had a negative coefficient but, in our case, only the second one was statistically significant. This partially goes in the direction that Barbieri *et al.*, (2019) explained in their research: in fact, as already discussed, when the driver in the first relocation is cost saving or productivity enhancing there is a higher propensity of undertake a RTC. In this perspective we decided to implement a second step in the econometric analysis, in order to understand if the industrial characteristics may have an impact on change this trend, or better, making an interaction between the three industrial explanatory variables and the productivity driver, it is expected a propensity of firms to carry out a RHC instead than a RTC. The interaction, performed using the same econometric model and sample of the previous analysis, gave the following results:

Variables	Model 2			Model 3			Model 4		
	Coeff.	z	P> z	Coeff.	z	P> z	Coeff.	z	P> z
Outsourcing Propensity	0.063	0.48	0.632	0.217	1.96	0.051*	0.203	1.75	0.081*
Capital Intensity	0.293	2.63	0.009***	0.211	2.01	0.045*	0.234	2.09	0.037**
Technological Intensity	-0.001	-0.01	0.990	0.068	0.61	0.541	0.069	0.67	0.500
Offshoring Market Driver	1.051	4.30	0.000***	1.039	4.21	0.000***	1.058	4.36	0.000***
Offshoring Asset Driver	-0.054	-0.41	0.681	-0.036	-0.28	0.779	-0.016	-0.12	0.905
Offshoring Cost Driver	-0.026	-0.25	0.802	-0.004	-0.04	0.967	-0.012	-0.12	0.903
Offshoring Productivity Driver	-0.496	-2.28	0.023**	-0.407	-1.83	0.068*	-0.792	-1.74	0.081*
Crisis 08-11	0.417	2.05	0.041**	0.433	2.12	0.034	0.417	2.02	0.043**
Host1 East-EU	0.263	0.69	0.492	0.222	0.56	0.574	0.215	0.54	0.586
Host1 Euro-Currency	-0.033	-0.13	0.899	0.044	0.16	0.872	0.060	0.23	0.822
Cultural Distance	0.020	0.18	0.859	0.001	0.01	0.991	0.006	0.06	0.953
Firm Size	0.114	1.13	0.259	0.098	0.97	0.332	0.090	0.85	0.393
Patents in FIR technologies	-0.022	-0.37	0.709	-0.022	-0.31	0.755	-0.019	-0.26	0.792
<i>Outsourcing Propensity*Offshoring Productivity Driver</i>	0.324	2.01	0.044**						
<i>Capital Intensity*Offshoring Productivity Driver</i>				-0.044	-0.29	0.771			
<i>Technological Intensity*Offshoring Productivity Driver</i>							0.130	0.85	0.395
Observations	263			263			263		
Wald Chi-Square	58.24			48.75			46.95		
Prob > Chi-square	0.000			0.000			0.000		
Pseudo R2	0.1646			0.1533			0.1558		
Log pseudo-Likelihood	-96.486			-97.793			-97.504		

Table 11 - Results of the Probit Model, second step [*p<0.10, **p<0.05, ***p<0.01]

In Model 2, the interactions between the *Outsourcing Propensity* variable and the *Offshoring Productivity Driver* ones is statistically significance ($p<0.05$), with a positive coefficient. This means that when a firm belongs to an industry with a high outsourcing propensity and decide to offshore production in order to search better conditions in term of productivity, there is a tendency to implement a RHC as a second relocation of production, supporting the expectation defined before.

In Model 3, the interaction of the *Capital Intensity* variable instead has a negative coefficient but is not significant, thus seems to be no connections with the productivity driver, not supporting the idea that this industry characteristic may invert the trend of a RTC in favour of a RHC when the driver is productivity enhancing.

In Model 4, when interacts the *Technological Intensity* variable with the *Offshoring Productivity Driver*, there is a positive coefficient but the statistically

significance is poor, thus is not possible to support the fact that firms in high tech industry searching higher productivity tend to relocate production in the home country rather than move continuously.

Since only one of the interactions give evidence of a strong connection between the industry characteristic and the *Offshoring Productivity Driver*, to gain more insights on the results, the interaction term was plotted. Figure 41 plot the interactions between the *Outsourcing Propensity* and the *Offshoring Productivity Driver*.

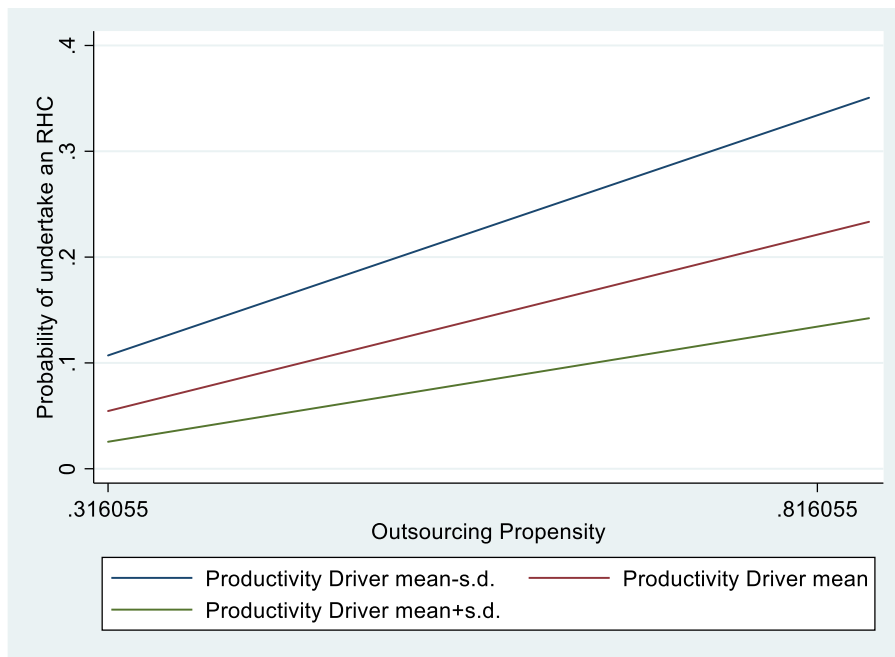


Figure 41 - Interaction plot *Outsourcing Propensity*Offshoring Productivity Driver*

CHAPTER V

Discussion of the results

5.1 – Analysis of the econometric model

Only recently the literature has posed its attention on the phenomenon of the relocation to home country, and therefore there are still many question marks and insights that have not been investigated yet. After years of massive exodus towards emerging and low-cost countries, this new disruptive phenomenon seems to have started inverting, at least partially, this trend. Consequently, nowadays, the academic effort is to understand and highlight what are the factors that provide firms with the opportunity to offset the low-cost or high-productivity location advantages of some foreign countries, thus electing the home country as a valid alternative to internationalization. Our contribution is directed to clarify how industry-specific characteristics can influence the firm decision to moving to home country or towards a new place.

More specifically, our results suggest that belonging to an industry with a high propensity to outsourcing can increase the probability to adopt a RHC, instead of a RTC. The hypothesis H1 formulated in the chapter 2 is confirmed, and the associated variable shows a positive and significant coefficient in the Probit model. This, basically, supports and gives evidence of the theoretical framework underlying the formulation of the related hypothesis. The use of outsourcing can be seen as an alternative to a relocation of second degree operations, and in particular to a relocation to third country. Indeed, a massive recourse to outsourcing can eliminate, or at least weaken, the location advantages of low cost countries and, simultaneously, allow companies to be more focus on core competencies and to gain access to external competencies and to improve quality (Barthélemy & Geyer, 2000; Quélin & Duhamel,

2003). For companies, and especially efficiency-seeking firms, localization of manufacturing activities in countries, where production costs are lower or productivity is higher, is of crucial importance (Elia *et al.*, 2019). Therefore, companies have started to establish their production activities in countries with low cost or high productivity advantages over the past decades, despite the higher vulnerability, longer lead times, and frequent quality issues experienced within their globally extended supply chains (Brennan *et al.*, 2015). But, the use of outsourcing seems to be a valuable alternative, representing the opportunity to reduce costs or increase flexibility, while eliminating the limits and the disadvantage of offshoring, reducing also the transaction costs. Consequently, companies operating in industry with a high recourse to outsourcing prefer to return home.

Our analysis also provides evidence that firms that operates in industry capital intensive are more likely to go back, when undertaking an RSD, and parallelly in industry labour intensive the RTC choice is the most likely. These results are confirmed by the Probit model, resulting in a positive and significant coefficient. Indeed, considering the cost reduction as the main motivations, and taking into account the rising labour costs in the “classical” low wage countries (i.e. China), it is possible to suppose that companies in labour intensive industries are inclined to continuously move exploring new countries, with the aim of reducing the labour costs. A high number of movements of production activities is expected, driven by the search of the new low-cost locations, following the change of the comparative advantage between countries. This is partially confirmed by Barbieri *et al.* (2019), who shows that, when the driver of the relocations is efficiency seeking, firms tend to implement more RTC, rather than RHC. On the contrary, capital intensive enterprises have, by definition, a lower proportion of workforce, so theoretically a lower need and propensity of reduce labour costs. This can confirm our initial idea of a lower tendency to search for new places that offer lower costs, which means that in capital-intensive sectors, companies, owning a large amount of fixed assets such as machinery and equipment, have a lower necessity to continuously move in search of lower labour costs, and thus can decide to come back home, implementing an RHC.

Moving on, we focus the attention on H3, i.e. the relationship between the technological level of the industry and the probability to undertake a RHC instead of

a RTC. In particular, the variable *Technological Intensity* shows a positive but non-significative coefficient. The possible reasons, underlying this result, are multiple. For instance, firms investing abroad to enhance their productivity are likely to rely on different advantages with respect to the mere exploitation of the low cost of labour. In particular, the main mechanism through which firms can enhance their productivity via cross-border investment is “learning-by-interacting”, which arises when firm are exposed to different technological, managerial and organization capabilities that are available in the ecosystem of the foreign country (Bertrand and Capron, 2015). In other words, firms are able to enhance their productivity by sourcing knowledge, resources and know-how from the foreign production system by establishing economic relationships with suppliers, buyers, competitors, partners, associations and labour markets (Alcacer and Oxley, 2012; Pisano and Shih, 2009; Oxley and Sampson, 2004; Oxley and Wada, 2009). For this reason, in those industries defined in this dissertation as high-tech, the need to have a window on the latest technology development and to have access to global and dispersed knowledge and know how, push firms to undertake a large number of relocations of second degree, moving always towards a new third country. In other word, firms tend to follow the evolution of the competitive gap between host and home country. Thus, this means a propensity to RTC instead of RHC operations and can explain also why we did not found support for hypothesis H3.

Finally, another relevant aspect is suggested by the study of Alcacér *et al.* (2016). Industry with a high technology intensity need a great and constant supply of new knowledge. As knowledge has become increasingly globally dispersed and yet connected, firms need to be able to construct new combinations of knowledge, the progress or success of which may depend at least initially on their capacity to build new forms of relatedness between formerly disparate branches of knowledge by connecting these across space. Firms start a cumulative process, moving continuously towards new places. The advantages of individual places become increasingly interconnected with one another. As a result, the international network control or orchestration of MNEs may become geographically more dispersed, and yet their ownership of assets becomes more concentrated in certain activities and places, with an eye on how they can best achieve both new value creation and value capture

together. All these factors can explain the absence of analytic support to our hypothesis H3.

Regarding the additional evidence, results show that only in case of industries with a high outsourcing propensity, there is the tendency to implement a RHC when the first offshoring driver is productivity enhancing. Furthermore, the graph in figure 41 shows that the Offshoring Productivity Driver mitigates the propensity to undertake RHC: in fact, when the productivity is high (green line), the probability to undertake a RHC is lower respect when the productivity is low (blue line). A possible explanation is that, when firms both belong to industries with high outsourcing propensity and are looking for higher productivity, they can take advantage of the higher efficiency associated to the suppliers, e.g. by exploiting economies of scale or by concentrating production on suppliers that are more productive and specialized than the single enterprise.

The productivity enhancing driver, on the contrary, does not have any significant moderation effect in none of the other two interactions.

5.2 – Policy makers implications

Our results allow to provide policymakers with an answer to these questions: Do industry characteristics have a role on the reshoring phenomenon of firms? What are the industries which perform more RHC and those who implement more RTC?

Governments should care about re-attracting firms in the home country or increasing FDIs from other countries, as these phenomena can have a positive effect on employment and GDP. In particular, the attention in the last years was concentrated on the back-reshoring, aiming to increase the rate of domestic firms that decided to come back home. Thus, it is important understand which are the manufacturing sectors that are more involved on RHC and, more specifically, if there are some industry characteristics that pushed firms in the direction of back-reshoring. As emerge from the analysis, policy makers, in order to reattract firms, should focus on outsourcing propensity enterprises and on capital intensive ones. On the other hand, as explained also by reshoring literature, the first motivations for relocations of second degree

regards cost reduction, in particular labour costs. Countries should try to appear more attractive, offering incentives for repatriation that able to offset the higher cost of labour, especially in western countries.

In addition, it is irrational that governments try to reattract enterprises without considering if there is an environment ready to sustain those investments in the home country. An example is the Industry 4.0 program developed by several countries, which require big amount of initial large investments but also a large set of managerial competencies and specialized skilled workers. Capital intensive industries for example, but also high tech sectors, require a lot of investments and are strongly involved in this kind of programs, so after developing a plan, governments require also to highly invest in R&D, infrastructures and in lower bureaucracy. Furthermore, automated factories require highly skilled workers, able to manage computer and technology, thus it is also important to support education system in order to create skilled workforce in the industries mentioned above. Regarding outsourcing propensity, the attention should be on creating in the home country a sustainable networks of suppliers of those industries that outsource more (e.g. *Manufacture of basic metal, Manufacture of coke and refined petroleum products, Manufacture of motor vehicles, trailers and semi-trailers*) and on creating incentives, as financial ones, hence firms are more inclined to produce locally rather than in a new country.

5.3 – Limits and future developments

Our dissertation has some limitations, which represent possible developments for further researches. Firstly, the dataset refers to public announcements of reshoring initiatives but it is not sure that all the enterprises effectively decide to implement a relocation of second degree. This is a limitation in the study but the authoritativeness of the institutions which collect data (i.e. an EU agency) increases the reliability of our analysis. Secondly, the database is constituted by firms which performs relocations inside European countries, so this creates a possible bias since RHC can be implemented only by European firms. Although Europe is the perfect context since it has been deeply affected by both offshoring and reshoring initiatives and has been subject to big political and economic transformations affecting the location advantages

of various countries, future studies could include a broader perspective, including USA and the main Asian countries (e.g. China, Japan and India). Thirdly, future researches should focus on analysing other drivers, for example at firm level, investigating the financial performance of the foreign subsidiary respecting to those of the home country.

Another limitation regards the three explanatory variables of our analysis: *Outsourcing Propensity*, *Capital Intensity* and *Technological Intensity*. Firms were gathered on the basis of the industry to which they belong, according to an own elaboration index that uses industry data. Despite the classifications that were created used data provided by reliable institutions as Eurostat, it is not possible to be sure that a firm, which is part of an outsourcing propensity industry, is actually heavily involved in outsource the production, or that a firm, which belongs to a capital intensive sector, uses more capital than labour force. A future analysis instead could use firm specific data to better establish the industry of the firm.

A further starting point for researchers could be to study the employment effect of RHC and RTC and the impact they have on country B and country C. In particular, in the study performed, the reduction of labour force referred to the first host country but was not present any information if these workers were relocated in an equivalent way in the home or second host country. Studying also this aspect can represent a useful contribution in the literature.

Finally, other future studies could look at the effect of the economic policies on RSD, from the point of view of policy makers, for example trying to comprehend the effectiveness of government incentives offered to companies that back-reshore production and the costs and benefits for the economy of the country.

Concluding remarks

In this dissertation we provide some evidence on the relationship between the RSDs and the characteristics of the industry in which the firms operates.

The results obtained, offer some insights. In general, a firm operating in an industry with a high outsourcing propensity will adopt a relocation strategy based on RHC. This is confirmed, moreover, for European firm subsample. In addition, also companies operating in capital intensive industries will return to the home country. On the other hand, we do not have empirical evidence for firms operating in high technology sectors.

We also performed a model in which the variable of outsourcing propensity is interacted with the productivity enhancing driver. The evidence shows a mitigation of the tendency to implement an RHC when the first offshoring driver is productivity enhancing.

A deeper analysis on the relationship between other relevant industrial characteristics and the pattern of relocation of second degree is suggested in future studies. Additionally, a focus on the employment effect and on the effectiveness of possible national economic policies, that can have an impact on the RHC and RTC, should be analysed. Another matter in favor of the continuation of the research is the extension of the geographic and temporal horizon, which can reinforce the results and/or show some aspects not captured in this thesis.

Hence, we can define this dissertation as a starting point for a future analysis of the relocation trends using the industrial characteristics (i.e. meso-perspective point of view) as relevant factors.

In conclusion, we strongly believe that our results can be considered as valid, shedding new light on aspect not yet investigated by literature.

Bibliography sources

- Albertoni, F., Elia, S., Fratocchi, L., & Piscitello, L. (2015). Returning from offshore: what do we know? *AIB INSIGHTS*, 15, 9-12.
- Albertoni, F., Elia, S., Massini, S., & Piscitello, L. (2017). 'The reshoring of business services: Reaction to failure or persistent strategy?' *Journal of World Business*, 52(3), 417-430.
- Alexander, M., & Young, D. (1996). Strategic outsourcing. *Long range planning*, 29(1), 116-119.
- Ancarani, A., & Di Mauro, C. (2018). Reshoring and Industry 4.0: How Often Do They Go Together?. *IEEE Engineering Management Review*, 46(2), 87-96.
- Ancarani, A., Di Mauro, C., Fratocchi, L., Orzes, G., & Sartor, M. (2015). Prior to reshoring: A duration analysis of foreign manufacturing ventures. *International Journal of Production Economics*, 169, 141-155.
- Ancarani, A., Di Mauro, C., & Mascali, F. (2019). Backshoring strategy and the adoption of Industry 4.0: Evidence from Europe. *Journal of World Business*, 54(4), 360-371
- Arnaboldi, M., Azzone, G., & Giorgino, M. (2014). *Performance measurement and management for engineers*. Academic Press.
- Auguste, B. G., Hao, Y., Singer, M., & Wiegand, M. (2002). The other side of outsourcing: Despite the difficulties, there is money to be made running routine operations for other companies. *The McKinsey Quarterly*, 53-64.
- Aykol, B., Palihawadana, D., & Leonidou, L. C. (2013). Research on the import activities of firms 1960–2010. *Management International Review*, 53(2), 215-250.
- Baraldi, E., Ciabuschi, F., Lindahl, O., & Fratocchi, L. (2018). A network perspective on the reshoring process: The relevance of the home-and the host-country contexts. *Industrial Marketing Management*, 70, 156-166.

- Barbieri, P., Elia, S., Fratocchi, L., & Golini, R. (2019). Relocation of second degree: Moving towards a new place or returning home? *Journal of Purchasing and Supply Management*.
- Barthelemy, J. and Geyer, D. (2000) IT outsourcing: findings from an empirical survey in France and Germany. *European Management Journal* 19(2), 195–202.
- Bednarzik, Robert W. 2005. ‘Restructuring information technology: Is offshoring a concern’. *Monthly Lab. Rev.* 128.
- Brown, J.S., Durchslag, S. and Hagel, J. (2002) Loosening up: how process networks unlock the power of specialization. *McKinsey Quarterly* 2, 59–69.
- Buckley, P.J. and Casson, M. (1976), *The Future of the Multinational Enterprise*, The Macmillan Press, London.
- Bunyaratavej, K., Doh, J. P., Hahn, E. D., Massini, S. & Lewin, A. Y., *Conceptual 150 Issues in Services Offshoring Research: Implications for Organizational Management and International Business*, Group & Organization Management, vol. 36, n. 1, pp. 70-102, 2011.
- Canham, S., & T. Hamilton, R. (2013). SME internationalisation: offshoring, “backshoring”, or staying at home in New Zealand. *Strategic Outsourcing: An International Journal*, 6(3), 277-291.
- Caroli, M. (2012). *Gestione delle imprese internazionali* Second Ed.
- Chakrabarti, A., & Mitchell, W. (2013). The persistent effect of geographic distance in acquisition target selection. *Organization Science*, 24, 1805–1826.
- Christopher, M., & Holweg, M. (2011). “Supply Chain 2.0”: Managing supply chains in the era of turbulence. *International Journal of Physical Distribution & Logistics Management*, 41(1), 63-82.
- Dachs, B., Ebersberger, B., Kinkel, S., & Waser, B. R. (2006). Offshoring of production-a European Perspective Frequency, Target Regions and Motives. *European Manufacturing Survey*.

- Dachs, B., & Zanker, C. (2014). Backshoring of production activities in European Manufacturing. European Manufacturing Survey. *Fraunhofer Institute for Systems and Innovation Research, November-December, 3(3), 8.*
- Dachs, B., Kinkel, S., and Jäger, A., (2017), “Bringing it all back home? Backshoring of manufacturing activities and the adoption of Industry 4.0 technologies”, *Munich Personal RePEc Archive.*
- Di Mauro, C., Fratocchi, L., Orzes, G., & Sartor, M. (2018). Offshoring and backshoring: A multiple case study analysis. *Journal of Purchasing and Supply Management, 24(2), 108-134.*
- Dunning, J. H., & Lundan, S. M. (1993). *Multinational enterprises and the global economy.* Edward Elgar Publishing.
- Dunning, J. H. (1998). Location and the multinational enterprise: a neglected factor?. *Journal of international business studies, 29(1), 45-66.*
- Dunning, J. H. (2000). The eclectic paradigm as an envelope for economic and business theories of MNE activity. *International business review, 9(2), 163-190.*
- Elia, S., Barbieri P., Fratocchi L., Dima G., (2019). ‘Relocations of second degree of efficiency-seeking firms: The role of industry 4.0 technology intensity and policies’. Paper presented at International Trade, New Technologies and International Organization of Production Milano, May 16-17, 2019.
- Ellram, L. M. (2013). ‘Offshoring, reshoring and the manufacturing location decision’. *Journal of Supply Chain Management, 49(2), 3-6.*
- Ellram, L. M., Tate, W. L., & Petersen, K. J. (2013). ‘Offshoring and reshoring: an update on the manufacturing location decision’. *Journal of Supply Chain Management, 49(2), 14-22.*
- Engel D., V., Procher, (2010), “Home Firm Performance after Foreign Investments and Divestitures”, *Ruhr Economic Papers, No. 193.*

- Felsenstein, D. and Bar-El, R. (1989), "Measuring the technological intensity of the industrial sector: a methodological and empirical approach", *Research Policy*, Vol. 18 No. 4, pp. 239-252.
- Ferdows, K., (2008), "Managing evolving global production networks", in Galavan, R., Murray, J., and Markides, C., (Eds), *Strategy Innovation and Change: Challenges for Management*, Oxford: Oxford University Press, 149-162.
- Foerstl, K., Kirchoff, J. F., & Bals, L. (2016). Reshoring and insourcing: drivers and future research directions. *International Journal of Physical Distribution & Logistics Management*, 46(5), 492-515.
- Franco, C., Rentocchini, F., & Vittucci Marzetti, G. (2008). Why do firms invest abroad? An analysis of the motives underlying foreign direct investments.
- Fratocchi, L., Ancarani, A., Barbieri, P., Di Mauro, C., Nassimbeni, G., Sartor, M., ... & Zanoni, A. (2016). Motivations of manufacturing reshoring: an interpretative framework. *International Journal of Physical Distribution & Logistics Management*, 46(2), 98-127.
- Fratocchi, L., Barbieri, P., Di Mauro, C., Nassimbeni, G., & Vignoli, M. (2013). Manufacturing back-reshoring-an exploratory approach for hypotheses development. *XXIV Riunione Scientifica Annuale Associazione italiana di Ingegneria Gestionale, "Entrepreneurship, innovation and the engine of growth"*, Politecnico di Milano, Milano, 17-18.
- Fratocchi, L., Di Mauro, C., Barbieri, P., Nassimbeni, G., & Zanoni, A. (2014). When manufacturing moves back: concepts and questions. *Journal of Purchasing and Supply Management*, 20(1), 54-59
- Fynes, B., Coughlan, P., Brennan, L., Ferdows, K., Godsell, J., Golini, R., ... & Taylor, M. (2015). Manufacturing in the world: where next?. *International Journal of Operations & Production Management*.
- Galbraith, J. 1973. *Designing complex organizations*. Reading, MA: Addison–Wesley

- Goold, S. D., Hofer, T., Zimmerman, M., & Hayward, R. A. (1994). Measuring physician attitudes toward cost, uncertainty, malpractice, and utilization review. *Journal of General Internal Medicine*, 9(10), 544-549.
- Grandinetti, R., & Tabacco, R. (2015). A return to spatial proximity: combining global suppliers with local subcontractors. *International Journal of Globalisation and Small Business*, 7(2), 139-161.
- Gray, J.V., Esenduran, G., Rungtusanatham, M.J. and Skowronski, K. (2017), “Why in the world did they reshore? Examining small to medium-sized manufacturer decisions”, *Journal of Operations Management*, Vols 49-51, pp. 37-51.
- Gray, J. V., Skowronski, K., Esenduran, G., & Johnny Rungtusanatham, M. (2013). The reshoring phenomenon: what supply chain academics ought to know and should do. *Journal of Supply Chain Management*, 49(2), 27-33.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1995). Multivariate data analysis New York. NY: Macmillan.
- Hatzichronoglou, T. (1997), “Revision of the high-technology sector and product classification”, [Working Paper no 1997/2], OECD Publishing, Paris.
- Hayes, D. C., Hunton, J. E., & Reck, J. L. (2000). Information systems outsourcing announcements: Investigating the impact on the market value of contract-granting firms. *Journal of information Systems*, 14(2), 109-125.
- Kakabadse, A. and Kakabadse, N. (2002) Trends in outsourcing. *European Management Journal* 20(2), 189–198.
- Kedia, B. L., & Mukherjee, D. (2009). Understanding offshoring: A research framework based on disintegration, location and externalization advantages. *Journal of World Business*, 44(3), 250-261.
- Kinkel, S., & Maloca, S. (2009). Drivers and antecedents of manufacturing offshoring and backshoring—A German perspective. *Journal of Purchasing and Supply Management*, 15(3), 154-165.

- Kinkel, S., Lay, G., & Maloca, S. (2007). Development, motives and employment effects of manufacturing offshoring of German SMEs. *International Journal of Entrepreneurship and Small Business*, 4(3), 256-27.
- Kinkel, S. (2012). Trends in production relocation and backshoring activities: changing patterns in the course of the global economic crisis. *International Journal of Operations & Production Management*, 32(6), 696-720.
- Kinkel, S., & Zanker, C. (2013). New patterns of German production relocation and back shoring activities after the global economic crisis. *Paper presentato all'EUROpean Operations Management Association (EurOMA), Dublino, Irlanda*, 7-12.
- Kinkel, S. (2014). Future and impact of back-shoring—Some conclusions from 15 years of research on German practices. *Journal of Purchasing and Supply Management*, 20(1), 63-65.
- Krugman, P. R., & Obstfeld, M. (2011). *International economics: theory and policy*. 9 th.
- Lacity, M. and Hirschheim, R. (1993a) The information systems outsourcing bandwagon. *Sloan Management Review*, 73–86.
- Lacity, M. and Hirschheim, R. (1993b) *Information systems outsourcing*. Wiley, New York.
- Lasi, Heiner, Peter Fettke, Hans Georg Kemper, Thomas Feld, and Michael Hoffmann. 2014. 'Industry 4.0'. *Business and Information Systems Engineering* 6(4):239–42.
- Lee, J., Kao, H. A., & Yang, S. (2014). Service innovation and smart analytics for industry 4.0 and big data environment. *Procedia Cirp*, 16, 3-8.
- Lepak, D. P., Takeuchi, R., & Snell, S. A. (2003). Employment flexibility and firm performance: Examining the interaction effects of employment mode, environmental dynamism, and technological intensity. *Journal of Management*, 29(5), 681-703.

- Lewin, A. Y., Massini, S., & Peeters, C. (2009). Why are companies offshoring innovation? The emerging global race for talent. *Journal of International Business Studies*, 40(6), 901-925.
- Manning, S. (2014). Mitigate, tolerate or relocate? Offshoring challenges, strategic imperatives and resource constraints. *Journal of World Business*, 49(4), 522-535.
- Manning, S., Massini, S., & Lewin, A. Y. (2008). A dynamic perspective on next-generation offshoring: The global sourcing of science and engineering talent. *Academy of Management Perspectives*, 22(3), 35-54.
- Mansfield, E., & Romeo, A. (1984). "Reverse" transfers of technology from overseas subsidiaries to American firms. *IEEE Transactions on Engineering Management*, (3), 122-127
- McDermott M.C., (2010), "Foreign Divestment: The Neglected Area of International Business?", *International Studies of Management and Organization*, Vol. 40, No. 4, pp. 37-53.
- Marchegiani, L., Giustiniano, L., Peruffo, E., & Pirolo, L. (2013). Le decisioni di outsourcing oggi. *Electronic Journal of Management*, 1.
- Markwald, R. (2004), "Intensidade tecnologica e dinamismo das exportações brasileiras", *Revista Brasileira De Comércio Exterior*, Vol. 79 No. 2, pp. 3-11.
- Martínez-Mora, C. and Merino, F. (2014), "Offshoring in the Spanish footwear industry: a return journey?", *Journal of Purchasing and Supply Management*, Vol. 20 No. 4, pp. 225-237.
- McFarlan, F.W. and Nolan, R.L. (1995) How to manage an IT outsourcing alliance. *Sloan Management Review*, 9–22.
- Mihalache, M., & Mihalache, O. R. (2016). A decisional framework of offshoring: integrating insights from 25 years of research to provide direction for future. *Decision Sciences*, 47(6), 1103-1149.
- Mouhoud, E. M. (2007). *Mondialisation et délocalisation des entreprises*. HAL

- Müller, J., Dotzauer, V. and Voigt, K-I, (2017), “Industry 4.0 and its Impact on Reshoring Decisions of German Manufacturing Enterprises”, Bode, C., Bogaschewsky, R., Eßig, M., Lasch, R., Stölzle, W. (Eds), *Supply Chain Research*, Springer Gabler.
- Mudambi, R., & Venzin, M. (2010). The strategic nexus of offshoring and outsourcing decisions. *Journal of Management Studies*, 47(8), 1510-1533.
- Nachum, L., & Zaheer, S. (2005). The persistence of distance? The impact of technology on MNE motivations for foreign investment. *Strategic Management Journal*, 26(8), 747-767.
- O’Mahony, M., & Van Ark, B. (2003). EU productivity and competitiveness: an industry perspective. *Can Europe resume the catching-up process?*
- Osborn, R. N., & Baughn, C. C. 1990. Forms of interorganizational governance for multinational alliances. *Academy of Management Journal*, 33: 503–519.
- Oxley, J., & Wada, T. (2009). Alliance structure and the scope of knowledge transfer: Evidence from US-Japan agreements. *Management science*, 55(4), 635-649.
- Quélin, B., & Duhamel, F. (2003). Bringing together strategic outsourcing and corporate strategy: Outsourcing motives and risks. *European management journal*, 21(5), 647-661.
- Quintens, L., Pauwels, P., & Matthyssens, P. (2006). Global purchasing: state of the art and research directions. *Journal of purchasing and supply management*, 12(4), 170-181.
- Rappaport, A. (1986). *Creating shareholder value: the new standard for business performance*. Free press.
- Ricciardi, A. (2011). L'outsourcing strategico. *Amministrazione e finanza*.
- Ricciardi, A., Pastore, P., Russo, A., & Tommaso, S. (2015). *Strategie di back-reshoring in Italia: vantaggi competitivi per le aziende, opportunità di sviluppo per il Paese* (Vol. 5, p. 16). IPE Working Paper.

- Rullani, E. (2011). L'internazionalizzazione invisibile. La nuova geografia dei distretti e delle filiere produttive. *Sinergie Italian Journal of Management*, (69), 3-32.
- Sako, M. (2005). Outsourcing and offshoring: key trends and issues. Available at SSRN 1463480.
- Sako, M. (2014). Outsourcing and offshoring of professional services. *The Oxford Handbook of Professional Service Firms*, 327-347
- Saunders, C.S., Gebelt, M. and Hu, Q. (1997) Achieving success in information systems outsourcing. *California Management Review* 39(2), 63–79.
- Schmeisser, B. (2013). A systematic review of literature on offshoring of value chain activities. *Journal of International Management*, 19(4), 390-406.
- Schoonhoven, C. B. 1981. Problems with contingency theory: Testing assumptions hidden within the language of contingency “theory”. *Administrative Science Quarterly*, 26: 349–377.
- Scott, W. R. 1992. *Organizations: Rational, natural, and open systems*. Englewood Cliffs, NJ: Prentice-Hall.
- Stentoft, J., Mikkelsen, O. S., Jensen, J. K., & Rajkumar, C. (2018). Performance outcomes of offshoring, backshoring and staying at home manufacturing. *International Journal of Production Economics*, 199, 199-208.
- Stephan, M., Silvia, M., & Arie Y, L. (2008). A dynamic perspective on next-generation offshoring: The global sourcing of science and engineering talent. *Academy of Management Perspectives*, 22(3), 35-54.
- Strange, R. and Zucchella, A., (2017), “Industry 4.0, Global Value Chains and International Business”. *Multinational Business Review* 25(3):174–84.
- Stringfellow, A., Teagarden, M. B., & Nie, W. (2008). Invisible costs in offshoring services work. *Journal of Operations Management*, 26(2), 164-179.
- Teece, D.J., Pisano, G. and Shuen, A. (1997), “Dynamic capabilities and strategic management”, *Strategic Management Journal*, Vol. 18 No. 7, pp. 509-533.
- Thompson, J. D. 1967. *Organizations in action*. New York: Prentice-Hall.

- Vestring, T., T. Rouse, and U. Reinert (2005). "Hedge Your Offshoring Bets." MIT Sloan Management Review 46(3): 27-2.
- Wan, L., Orzes, G., Sartor, M., Di Mauro, C., & Nassimbeni, G. (2019). Entry modes in reshoring strategies: An empirical analysis. *Journal of Purchasing and Supply Management*, 25(3), 100522
- Zawislak, P. A., Fracasso, E. M., & Tello-Gamarra, J. (2018). Technological intensity and innovation capability in industrial firms. *Innovation & Management Review*, 15(2), 189-207.

Sitography sources

<http://www.americanmanufacturing.org/blog/entry/more-troubling-signs-for-american-auto-jobs-and-manufacturing-employment> (accessed 02/03/2019)

<https://www.bcg.com/publications/2011/made-in-america-again.aspx> (accessed 09/03/2019)

<https://www.businessinsider.com/r-euro-zone-companies-come-home-as-asian-costs-rise-2014-12?IR=T> (accessed 09/03/2019)

<https://www.economist.com/britain/2017/10/19/brexit-triggers-a-round-of-reshoring> (accessed 02/03/2019)

<https://www.forbes.com/sites/billconerly/2014/09/02/reshoring-or-offshoring-u-s-manufacturing-forecast-2015-2016/#7c0aae43611a> (accessed 09/03/2019)

<https://www.pwc.com/it/it/publications/assets/docs/reshoring.pdf> (accessed 02/03/2019)

<https://tradingeconomics.com/china/wages-in-manufacturing> (accessed 05/05/2019)

Annexes

Annex I: Nace Rev. 2 sectors classification

Division	Description
10	Manufacture of food products
11	Manufacture of beverages
12	Manufacture of tobacco products
13	Manufacture of textiles
14	Manufacture of wearing apparel
15	Manufacture of leather and related products
16	Manufacture of wood and of products of wood
17	Manufacture of paper and paper products
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products
22	Manufacture of rubber and plastic products
23	Manufacture of other non-metallic mineral products
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment
29	Manufacture of motor vehicles, trailers and semi-trailers
30	Manufacture of other transport equipment
31	Manufacture of furniture
32	Other manufacturing
33	Repair and installation of machinery and equipment

Table 12 - Nace Rev. 2 sectors classification

Annex II: Representative test

Industry tech level				
	Sample		Population	
NACE1digit = 1	63	23.95%	129	21.90%
NACE1digit = 2	183	69.58%	417	70.80%
NACE1digit = 3	17	6.46%	43	7.30%
n	263		589	
X^2	0,67			

Firm Size (number of employees)				
	Sample		Population	
<10	21	7.98%	45	10.27%
Btw 10 e 49	18	6.84%	31	7.08%
Btw 50 e 249	7	2.66%	41	9.36%
>250	217	82.51%	321	73.29%
n	263		438	
X^2	0,00			

Country Home				
	Sample		Population	
Non EU	110	41.83%	242	41.09%
East EU	2	0.76%	8	1.36%
West EU	151	57.41%	339	57.56%
n	263		589	
X^2	0,69			

Country Host				
	Sample		Population	
Non EU	0	0.00%	0	0.00%
East EU	35	13.31%	89	15.11%
West EU	228	86.69%	500	84.89%
n	263		589	
X^2	0,72			

Announcement Year				
	Sample		Population	
2002	0	0%	9	1.53%
2003	988	3.04%	17	2.89%
2004	18	6.84%	48	8.15%
2005	28	10.65%	59	10.02%
2006	36	13.69%	89	15.11%
2007	18	6.84%	46	7.81%
2008	16	6.08%	42	7.13%
2009	27	10.27%	55	9.34%
2010	10	3.80%	20	3.40%
2011	11	4.18%	26	4.41%
2012	16	6.08%	33	5.60%
2013	19	7.22%	43	7.30%
2014	18	6.84	43	7.30%
2015	15	5.70%	18	3.06%
2016	10	3.80%	19	3.23%
2017	10	3.80%	16	2.72%
2018	3	1.14%	6	1.02%
n	263		589	
X^2	0.61			