UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

Learning to Manage the Unmanageable

A Case Study on Exchange Rate Risk Management within Globally Sourcing Multinational Corporations

Master Thesis; Master of Science in Business & Economics with Specialization in International Business and Trade, 30.0 credits

University: School of Business, Economics and Law at the University of Gothenburg

Authors: Charlotte Granfors Wellemets and Jun Liu

Advisor: Mikael Hilmersson

Spring 2017

Preface

We would like to raise our greatest appreciation towards our loved ones and friends who have been putting up with our formal language and unexpected interest in exchange rate movements over the past five months. Without them, this thesis would not have been possible.

Secondly, we are immensely grateful for the time and efforts the individuals at the case company have put in. We are especially grateful towards the person in charge of the thesis project at the company - you know how you are.

We would lastly like to acknowledge our supervisor Mikael Hilmersson for bringing forth important input during this process, providing us with the right tools and energy.

Charlotte Granfors Wellemets

Jun Liu

May, 2017

Abstract

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Background and problem: Existing research has shown that the various risks related to multinational corporations' (MNCs) supply chains are inherent cost drivers, creating managerial challenges and coherently affecting the bottom line of the companies (Clark & Marois, 1996;Stanczyk et al., 2017). Accentuated in existing theory as especially burdensome to manage is the risk of fluctuating exchange rates, e.g. exchange rate risks (ERR), due to their almost constant state of unpredictability (Holweg et al., 2011). Consequently, MNCs need to find strength and reassurance in operational competence and well-developed exchange rate risk management (ERM) strategies from this marked up vulnerability, however this is easier said than done. Multiple financial risk mitigating measures are set forth in theory (Butler, 2004;Papaioannou, 2006;Eiteman et al., 2007) for MNCs to enforce. However, the theoretical discussion in general lack of the viewing point of ERM as a pure firm capability from an international and financial interactive perspective. With this inadvertence, potentially important managerial implications might not have been given their justified attention, implying that the ERM capability of MNCs possess great potential of being further developed.

Aim of study: The set out purpose of this research was to explore how the ERM capability is handled and can be developed within a globally sourcing MNC.

Methodology: A case study was undertaken as the research strategy for this research, using qualitative interviews to collect the empirical data. Following the data collection, the authors conducted an analysis and comparison of the five case subjects, in order to achieve the aim of the case study.

Conclusions: Conclusions drawn tell us that MNCs identify ERR differently, and the risk reducing actions will depend on the characteristics of the MNC, the individuals within it and its ERM procedures. Further, the critical components in ERM are put forward as being: knowledge, information, communication, collaboration, prioritization and analytical capabilities, as well as negotiation skills and flexibility. By developing these, the ERM capability will be enhanced. Conclusions also imply that not only possessing the knowledge is enough in order to enhance the MNCs ERR reducing efforts. Knowledge needs to be coordinated and transferred in a suitable manner as well between different individuals throughout the network of the MNC.

Keywords: Exchange Rate Risk Management, Multinational Corporations, Global Sourcing, Risk Management, Capability Transfers

Glossary

Term:	Definition:
Exchange Rate Risk(s) (ERR)	The volatility of an exchange rate
FOREX	Risk and exposure to foreign exchange (FOREX) generated by unexpected fluctuations in currency rates is a multileveled challenge, for both domestic and internationally sourcing companies
Exchange Rate Risk Management (ERM)	A set of managerial skills, incl. capability creation and transfer, and financial risk mitigating management models, used to manage ERR
External Exchange Rate Risk Management Strategies	External financial derivatives aimed to eliminate transaction risk
Currency Forward Contract (CFC)	An agreement between two parties. Under CFC, two parties agree to convert a fixed amount of foreign currency by a pre-fixed currency rate, at a pre-fixed future date
Currency Futures	An agreement to deliver a standard amount of a specified foreign currency at a predetermined date, standard place and an agreed price
Currency Options	A contract that gives the option buyer the right to buy or sell a fixed amount of the underlying currency at a predetermined price per unit before or on the expiration or maturity date
Strike Price / Exercise Price	Payment of the price if buyer exercise the option
Premium	The cost of price to buy the option
A Call	An option to buy foreign currency
A Put	An option to sell foreign currency
Internal Exchange Rate Risk Management Strategies	A tool used by a company that aims to mitigate the currency risk within the corporate network, without any interference from outside of the corporate
Matching	A company matching a similar amount of outflows and inflows in the same currency at the same time period
Lead & Lag	Leading refers to making a payment early; Lag refers to making a payment late
Ordinary Capabilities	Capabilities that are more easily replicated and transferred
Dynamic Capabilities	Well-developed best practices that are not easily replicated and transferred, e.g., unique problem solving capabilities
Sourcing Buyer/Buyer	Individual appointed to source and procure components

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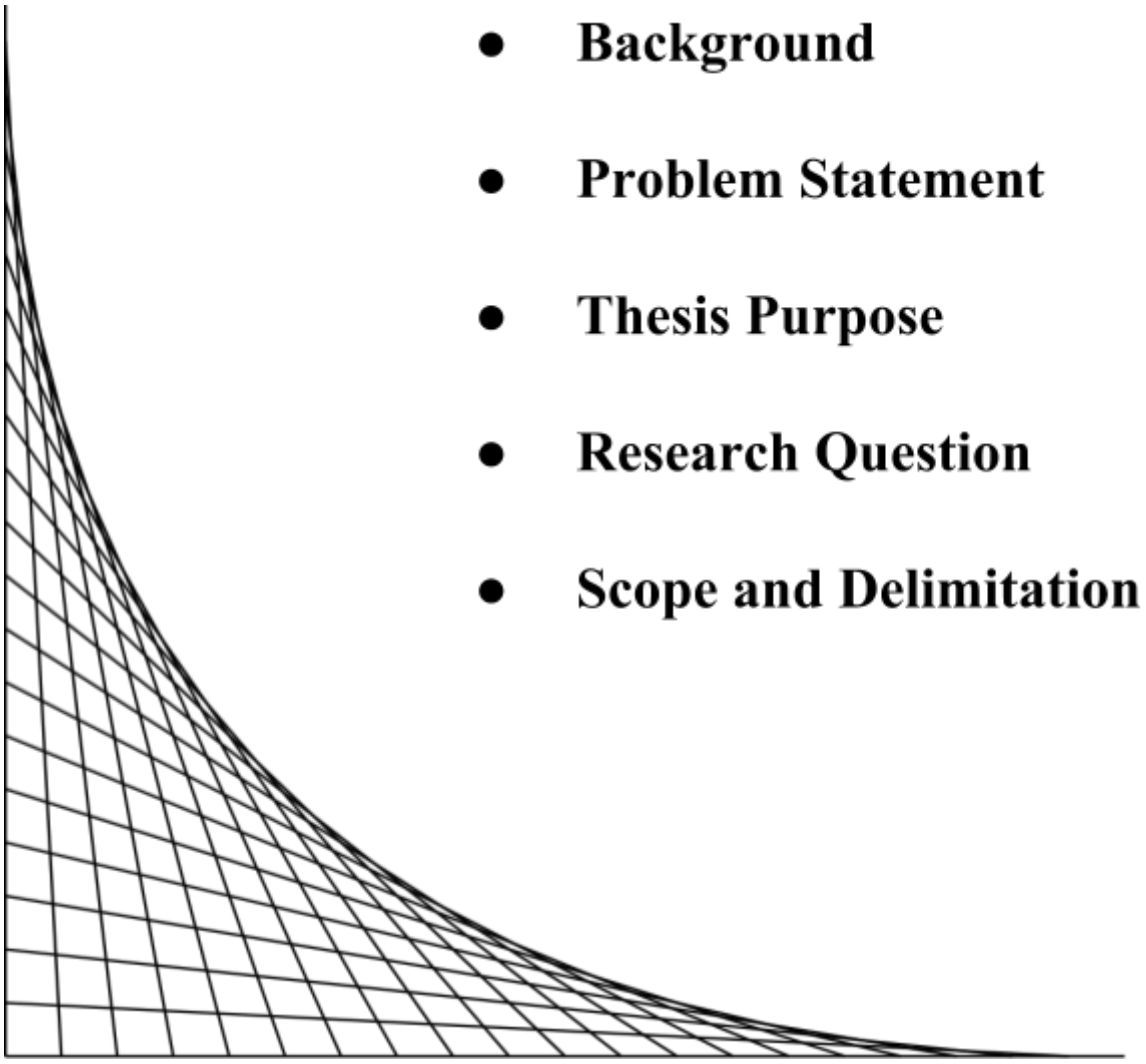
1. Introduction



This chapter starts with giving the reader a background of the study as well as the importance of ERM from both an academic and business related perspective. The background briefly introduces the phenomenon of globalization, global sourcing, exchange rate fluctuations, the meaning and capabilities of MNCs and ERM, followed by an introduction of the purpose and the problem statement of this thesis. The scope and delimitations will be stated in the end of the section.

1.1 Background

Multinational corporations (MNCs) are exposed to a plethora of uncertainties and risks in global sourcing activities, which command managers to have the right skill-sets to promptly recognize these and consequently identify ways to manage them (Wang, 2015). The main reason why MNCs have traditionally outcompeted smaller firms and local competition is the MNCs' superior ability to develop and transfer knowledge and skill-sets across borders (Kogut & Zander, 1995;Kogut & Zander, 2003). These skill-sets, in theory denominated as capabilities (Teece, 2014), can be developed in any part of the organization and can, for example, entail a well-developed set of skills in communication, trust generation or conflict resolution and so on and so forth (Tyler, 2001;Ritter & Gemünden, 2003;Walter et al., 2006). Since developing greater knowledge sharing routines (for sharing capabilities across the MNC) has a positive impact on a firm's overall management capabilities (Haltiwanger, 2012). Consequently, specific knowledge transfer procedures might aid managers in the detection and management (Wang, 2015) of risks encountered in their sourcing operations.

Of all the risks encountered in various MNCs sourcing operations, one of the most well known and deep-seated ones is exchange rate risk (ERR), which stems from exchange rate fluctuations (Sarkis & Shu, 2008). The actual term *ERR* may be defined in terms of the volatility of an exchange rate, present on both a macro level, affecting a country's economic state in areas such as consumption and production, as well as on a micro level, where global companies face these fluctuations in operations daily (Clark & Marois, 1996).

Essentially, the impact exchange rates have in the purchasing process stems from a time lag between the point a purchasing contract is undersigned to the point when payment de facto is made (Carter & Vickery, 1989). Regardless of currency decided upon in the contract, this time lag gives the currency rate room to fluctuate, resulting in the buyer paying either considerably more or less than the price decided upon in the contract (ibid). In that sense, profits may change direction due to moves in the exchange rates included in the company's portfolio of purchasing activities, but the risk may be two-folded in its character, presenting both a threat and an opportunity (Clark & Marois, 1996). Focusing on the potential downturns from exchange rate movements, the ERR factor can be translated into *financial risk*, where organizations may potentially lose a substantial amount of money in their investments and purchasing decisions through poor exchange rate risk management (ERM) (Suranovic, 2005). Consequently, this highlights a strong need for operational competence and strategies dealing with an issue, such as this, throughout the organization (Trent & Monczka, 2005;Gupta, 2006;Senft, 2014), where the major challenge is to create managerial reactiveness and form methods to cope with ERR. This type of reactiveness and management methods used in dealing with ERR may be delimited as a specific skill-set (i.e. a firm capability) (Teece, 2014), linking risk management to capabilities, and further emphasizing the importance of their transferability. Now, looking at ERM as a capability of the firm, in accordance with Kogut and Zander (1995), if it is properly developed, managed and transferred, the organization has the ability of outcompeting other firms who are not as efficient in its ERM.

Earlier business research presents numerous methods in terms of working with general risk assessment and risk mitigation measures of risks associated with global sourcing (Raz & Michael, 2001;Geunes, 2005;Sodhi & Tang, 2012), however theory dealing specifically with ERR often stems from the finance field (Pike et al., 1999;Bennet, 2003;Butler, 2004;Papaioannou, 2006). As will be presented and discussed later in this thesis, many corporate strategies aimed at managing ERR are characterized by being both of high risk and high return depending on the characteristics of the MNCs' business activities (Butler, 2004). Close to all transactions in a foreign currency are at some point exposed to ERR, however there are models which can be used to mitigate such exposures, including for example: currency forwards, currency futures and currency options (ibid).

In terms of choosing the most well-matched ERR mitigation strategies for the MNC, there are numerous factors which need to be taken into account by the management (Bennet, 2003). Some of these are which type of exposure the MNC is encountering, the risk attitude of the managers and the time-horizon the ERR reducing measures are going to focus on (ibid). Regardless, the management has to possess the competence and ability to oversee what is necessary and feasible, which in itself might be a challenge (Bennet, 2003;Butler, 2004).

1.2 Problem Statement

Through its need of well-working sourcing strategies, the actual concept of global sourcing is giving the phenomenon globalization a practical meaning, indicating managerial tasks of integration and coordination on a global basis (Trent & Monczka, 2005). It is a multifaceted and complex task, highly demanding of resources and entailing countless risks (Senft, 2014). Naturally, as companies strive to find better, and fresh state-of-the-art, approaches to compete globally, importance and attention given to the topic of international business strategies is gaining in size (Trent & Monczka, 2005). For any MNC, the grandiosity of possessing and mastering proper knowledge within international business strategies is that it generates the crude ability to unlock the treasury of opportunities, both for overall improvement and in realizing hitherto unexplored ways of supply chain management (ibid). Needless to say, MNCs must take into account their advantages when competing in the global market, therefore forming optimal manufacturing and sourcing strategies, in terms of cost -, risk- and competitive advantage management, is crucial for MNCs' business strategies (Kouvelis, 1999). Apart from unlocking new business opportunities and new ways of managing business affiliates, higher and wider demands on operational competence and strategies stems from marked up vulnerability in the supply chains (Trent & Monczka, 2005;Senft, 2014;Gupta, 2006). This vulnerability is a state caused by the multiple risks which are ever-present down these chains (Stanczyk et al., 2017).

Since, even though the efficiency levels in them are increasing, much due to advancements in information technologies (IT), the higher degree of interrelatedness between the MNCs and their supplier links is associated with a great amount of risks (Geunes, 2005).

Narrowing down the problematization focus onto the financial performance of an MNC, the supply chain risks are seen as cost drivers which then affect the bottom line of the company (Clark & Marois, 1996;Stanczyk et al., 2017). Especially difficult to manage, due to its almost constant state of unpredictability, are fluctuating exchange rates, which extend into a risk category, in previous research, denominated as *hidden costs* (Holweg et al., 2011). As explained by Holweg et al. (2011), these are to be seen as indirect costs, not directly linked to the actual supply chain activities, but rather a result of inescapable alterations in the global environment surrounding an MNC. Fluctuating exchange rates carry a heavy weight of importance as well as difficulty for sourcing managers, as it is a recurring and deep-seated risk in an MNC's global sourcing process, affecting the financial results of the firm as well as its competitiveness and future growth possibilities (Bennet, 2003;Suranovic, 2005). They are tremendously troublesome to assess, much due to the aforementioned trait of incurring on an inconstant basis as well as them becoming even more complex to predict the more one extends the estimation horizon (Holweg et al., 2011;Stanczyk et al., 2017). In that sense, profits may change direction due to moves in the exchange rates included in the company's portfolio of purchasing activities (Clark & Marois, 1996). In order to cope with this issue, managerial attention must be paid to evaluating and re-evaluating sourcing decisions and sales strategies in order to stay on top of the ERR (Suranovic, 2005;Hu & Motvvani, 2013). This managerial trait is in theory denominated as a capability, indicating that a set of skills have been put together in order to direct a problem (Govindarajan & Gupta, 2000;Teece, 2014), which in this case concerns assessing fluctuating exchange rates and the management regarded to that specific issue. Citing Wilson (2015, p.4) "*What gets measured, gets managed*", the task seems straightforward, however it is challenging even assessing the ERR one might be exposed to, in order to begin to manage them, due to this dynamic state (Bennet, 2003). This implies that international firms need to go beyond their current best practices (i.e. ordinary capabilities) in knowledge creation and application, and step into the generation of unique processes and problem solving capabilities (Teece, 2014;Kogut & Zander, 1996), which will aid the ability of catching ERR throughout the supply chain more efficiently.

Earlier business research presents numerous measures of both assessing and mitigating general business risks, however only lightly touching upon ERR (Raz & Michael, 2001;Geunes, 2005;Sodhi & Tang, 2012).

The theoretical family of existing literature more strongly emphasizing ERR and ERM is of a rather more finance related character, presenting both traditional and modern financial ERR mitigating models, crucial for both small and large organizations competing internationally (Bennet, 2003;Butler, 2004;Kim & Park, 2014;Broll & Wong, 2015). These financial risk mitigating management models, including for example currency forward contracts and currency futures, are well described in theory through financial instruments (Butler, 2004;Papaioannou, 2006). However, shortcomings in this type of literature are shown in the lack of actual descriptions of ERM as a pure firm capability. Granted, general risk management methods in earlier business research is presented in a manner of how to identify and assess risk based on success factors, such as maintaining *flexibility* in the sourcing processes (Sodhi & Tang, 2012;Geunes, 2005) and research by Teece (2014), as well as Kogut and Zander (2003), on firm capabilities and knowledge transfers can beneficially be applied in these ERM processes as well. However, the issue remaining is the lack of an international business and finance interactional perspective, exploring the importance of developing the ERM capability within a globally sourcing MNC. Hence, as many of the managerial challenges and procedures linked to this interactional ERM capability have not been highlighted, the ability of controlling ERR through ERM, and process enhancements within the field, might have been lost along the way. Subsequently, when employees in charge of sourcing components globally, or managing global sourcing teams, today, are facing ERR on a recurring basis, they might also be facing the risk of suffering from inadequacy of the relevant ERM tools and knowledge. In the same light as this, if not completely lacking these tools and knowledge, one sourcing unit of the MNC might dangerously be facing an inadequacy in some procedures of the ERM practices, which in reality already could have been mitigated by an adequacy of this procedural knowledge residing in another part of the MNC. These gaps in an MNC's ERM capability are consequently important to fill, subsequently, what needs to be explored is how the ERM capability is handled, along with how it might be developed over time, for example in terms of capability transfers within the network of an MNC. Generating knowledge to this field will yield managerial implications which will aid MNCs in their ERM efforts.

1.3 Thesis Purpose

The main purpose of the thesis is to explore how the ERM capability is handled and can be developed within a globally sourcing MNC.

1.4 Research Question

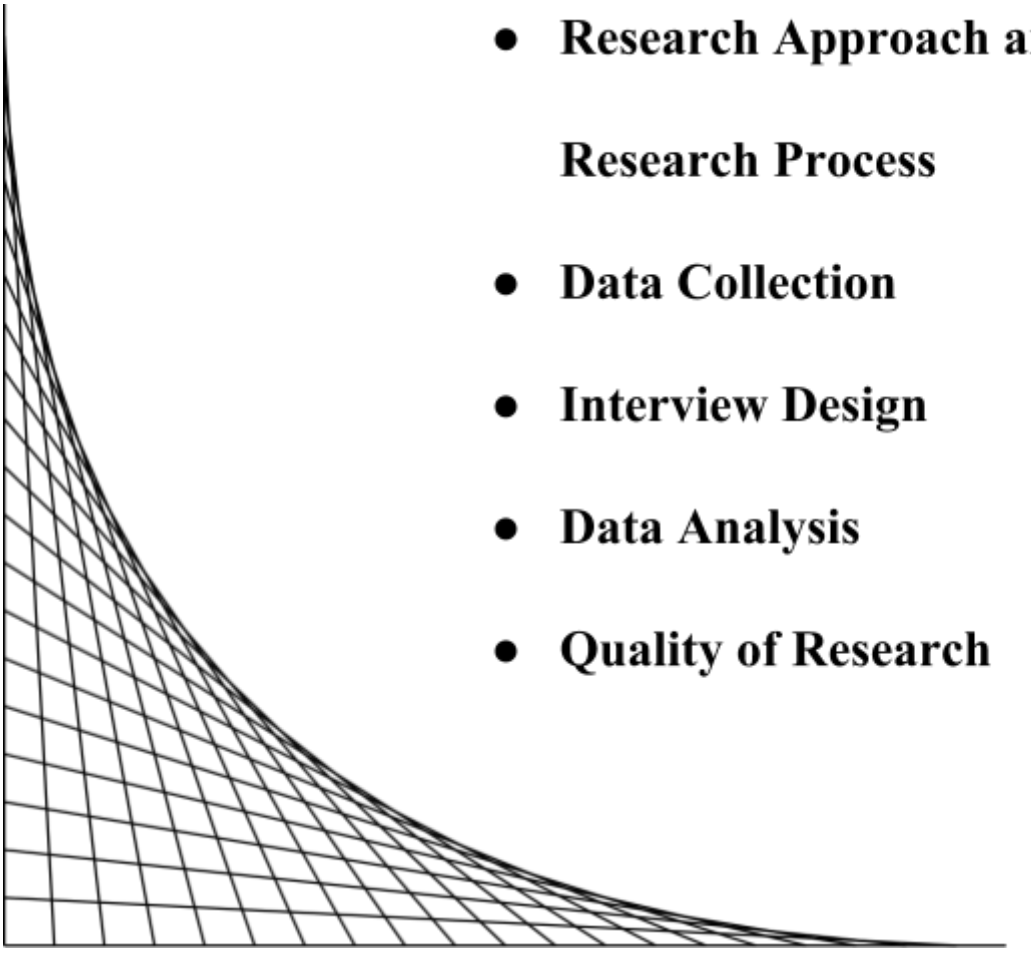
In the pursue of exploring ERM from an international business and finance interactional perspective, the aim is to answer the following research question:

How is ERM handled within globally sourcing MNCs?

1.5 Scope and Delimitation

This thesis project will carry a focus on the risks of exchange rate fluctuations, MNCs' exposure to these and ERM as a capability. The case company is a heavily geographically spread one with a broad supplier network, and although the buyers are globally dispersed, this study mainly focuses on insights of one of the global purchasing teams within said case company. The sourcing process within the other two existing purchasing departments however share most of the same characteristics as the interviewed team, as informed during the interviews. Since the research is based on the global sourcing activities of the case company, which then stands on a buyers' angle, the major delimitation of this study is the fact that it mainly applies the buyers' perspective in the sourcing process.

2. Research Methodology



- Research Approach and Research Process
- Data Collection
- Interview Design
- Data Analysis
- Quality of Research

The following chapter not only in detail expounds the research process, the research strategies and approaches that are used, but also explains the reasons as to why the authors conducted this research via the specific strategies. Furthermore, how the authors aimed to ensure the quality of the study is discussed at the end of the chapter

2.1 Research Approach and Research Process

As the usage of an inductive research approach is usually applied in bound up qualitative research (Bryman & Bell, 2011), the authors, in order to accomplish the aim of the thesis, exploring how MNCs could better handle and develop their ERM capability, choose to conduct interviews followed by an analysis of the collected empirical data whilst undertaking an inductive research strategy. This decision was reached also due to the characteristics of the issue which was faced, namely that ERM as a capability within the MNC network, from an international and financial interactive perspective, has received little attention, where authors such as Merriam & Tisdell (2016) argue that a qualitative approach applies when there is a deficit in theory in a specific situation or when the existing theoretical framework cannot sufficiently interpret a phenomenon.

Due to the characteristics of chosen research question, the contemporary characteristic of the study and the level of control on observable events, the authors applied a case study approach. Yin (2014) states five types of research questions, among which the "how" type question usually is applied in the case study. In order to elaborate the impacts of volatile exchange rate movements on a globally sourcing MNCs ERM procedures characteristics, and possible development opportunities, a “how” question was deemed as both applicable and necessary. Further on, due to the time limitation of the research project, the complexity of the topic and the tacitness of related knowledge, an aim to gather information in the elected field from multiple MNCs was seen as a mission which could be difficult to accomplish. Due to this, a single case study was conducted in this research, where the case company, divided into multiple units of analysis (the interviewees), provide the comprehensive information on their encounter with ERR and various issues linked to this.

This indicates that an embedded single-case design was used, in accordance with Yin (2014), where a comparison and an analysis of five case subjects were conducted with different purchasing buyers (see Figure 2.1). Consequently, the five subjects represent the five units of analysis. Although these subjects work within one department, they are responsible for different component segments and are located in different sourcing regions. This implies that the important difference between these is based on the line of responsibilities. With this discrepancy, the authors believe that the behaviors of the different individuals even in the same department have distinct opinions on ERM as a capability. In deciding who to interview, the crucial matter was that all of the interviewees engaged in cross-region sourcing activities, in which they had faced, or were facing, exchange rate fluctuation issues. As the authors contacted the interviewees, all these case subjects were informed that the authors will not disclose any confidential information of the case company related to the topic, which might have given them the confidence to speak out more freely.

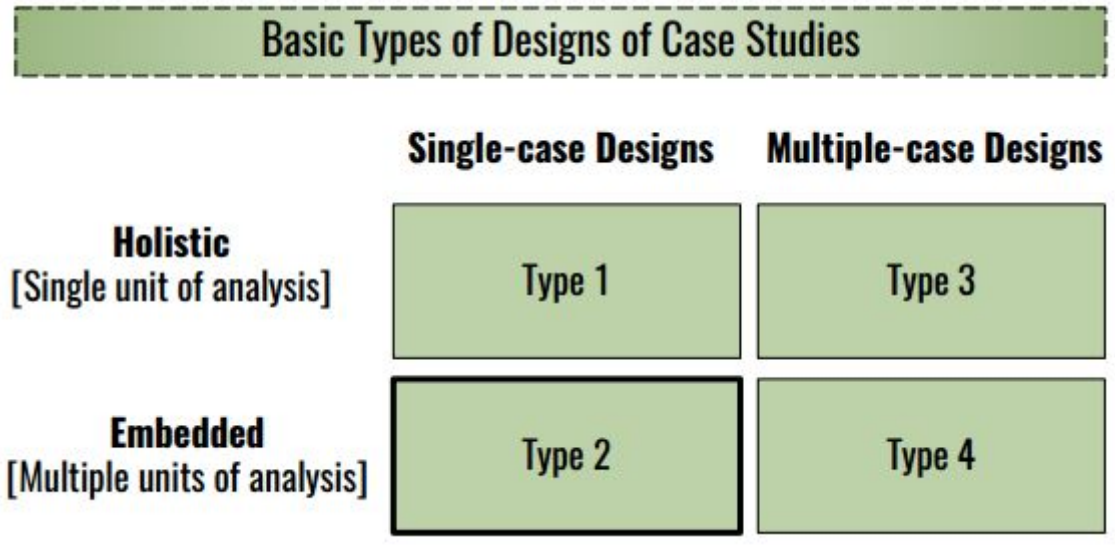


Figure 2.1, Basic Types of Designs of Case Studies, Based on Yin (2014)

To explain the process even further, the case study was completed by two stages: the with-in case analysis and the cross-case analysis. At the first stage, every buyer's case was treated as an integrated case in and of itself, from which the authors could study the individual's point of view on the research topic. After the with-in case analysis was done, the cross-case analysis started. In the cross-case analysis, the authors undertook the crossover analysis on all of the subjects. Further, in the end, the authors had then compared and analyzed one single

case unit consisting of multiple units of analysis, exploring opinions, procedures and potential development aspects of ERM within the MNC.

Short descriptions of the different units of analysis are briefly presented in the following paragraphs (see table 2.1 below). In accordance with the case company's request, both the company and all interviewees were to be anonymous throughout the thesis to protect confidential data and assure all of the interviewees felt as free as possible to explain their potential issues. In line with this, the authors created fictional names, in order to ensure the requested anonymity and, at the same time, heighten the reader's understanding of the text when it came to who said what. Although anonymity is necessary in particular situations, such as when dealing with a controversial topic, or when the performance of the case company will be influenced in a hazardous way, anonymity might not be a desirable option (Yin, 2014). The main reason is that relevant background data of the case may have to be excluded, and, furthermore, to meet anonymity, the authentic identities of a case must be systematically transformed to fictitious ones, which might be challenging for the authors (ibid). In order to deal with this, the authors have tried to explain, to the furthest extent possible, the geographical spread, ERM behavior and the sourcing buyer situation of the company, in order for the reader to fully grasp both the severity and implications of the ERM issue even though lacking of more information about the company and interviewees.

Interviewee	Background
Jonathan Rodriguez Person A	A Senior Sourcing Buyer, located in Sweden, responsible for purchasing specific parts for globally dispersed assembling plants.
Daniel Ancher Person B	A Sourcing Buyer, located in India, responsible for purchasing specific parts for globally dispersed assembling plants.
Tammo Jefferson Person C	A Senior Sourcing Buyer, located in the U.S., responsible for purchasing specific parts for globally dispersed assembling plants.
Sara Walker Person D	A Senior Sourcing Buyer, located in China, responsible for purchasing specific parts for globally dispersed assembling plants.
Peter Murthy Person E	A Sourcing Buyer, located in India, responsible for purchasing specific parts for globally dispersed assembling plants.

Table 2.1, Presentation of Interviewees, Based on the Collected Data

Going back to the beginning of the research, it started with defining the scope of the project through discussions with the supervisor at the case company, as well as an academic supervisor, in order to explicit the width and depth of the research. The start-up meeting with the supervisor, who is a senior sourcing buyer at the case company, gave an overall view of ERR in global sourcing activities. In the later meetings, the purchasing process (including supplier selection), historical profit/loss examples related to exchange rates and existing ERM methods used by the case company were presented, along with the process so as to better understand the challenges which the organization faces. The authors, at the same time, arranged several meetings with their academic supervisor, seeking for advice from an academic perspective. After these first unstructured interviews (as presented in table 2.2 below), the authors settled the dates for the rest of the interviews with the sourcing buyers, e.g. case subjects, in the case unit. As described above, the process was at times iterative however the overall process is illustrated below, in order to clarify the dynamism and stages of the undertaken research:

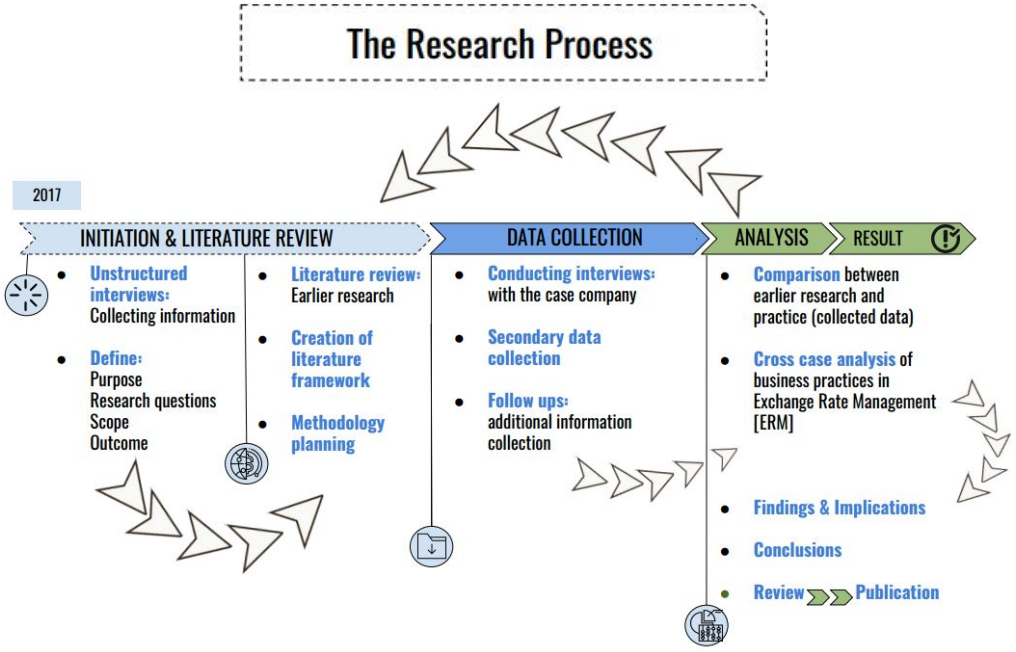


Figure 2.2, The Research Process, Authors Own Creation

2.2 Data Collection

Data collection in this research comes from both primary data and secondary data, interviews, presentations, reports and internal organizational documents have all served as important instruments in achieving the main aim of this research. The data the authors received, from the real business environment, honestly presents the issue and meanwhile allows the authors to further analyze the specific context.

2.3 Interview Design

The interview approach is the most common method used in qualitative research, however the usage of different types of interviews varies between different researchers (Bryman & Bell, 2011). There are three main types of interviews: unstructured, semi- structured and highly structured (Merriam & Tisdell, 2016), whereas the authors undertook several unstructured interviews with the case company at the early stage of the research. This type of interview is similar to a conversation, being highly flexible (Bryman & Bell, 2011) and it is perfectly suitable for researchers who lack of knowledge about a certain phenomenon, in order to gain the ability to formulate interview questions (Merriam & Tisdell, 2016). At the beginning, the main goal of the unstructured interviews was therefore to get an overall understanding of the research problem so as to contribute to the literature reviews. At this stage, the authors had decided the scope and objective of the research and had gained some knowledge on the global purchasing process, suppliers selection process, the current ERM methods used by the case company, and other relevant background information. However, totally unstructured interviews are unlikely to be the solo interview strategy in qualitative research (Bryman & Bell, 2011), which also was the case in this study where the authors combined it with the semi-constructed interview strategy, which is placed in the middle of an unstructured interview and a highly structured interview, at the later stage of the process (ibid). After these unstructured interviews and literature reviews were completed, the authors had gained knowledge on how to formulate the relevant questions in order to fulfil the overall objective of the research. The authors arranged semi-constructed interviews with different sourcing buyers in the empirical part, where a prepared question list was sent by the authors to the interviewees approximately one week before conducting the interviews.

The questions on the list were designed by the authors, with influences from the supervisor from the case company. The main reason as to why the question list was sent out in advance was the fact that the topic is of high complexity, and the authors concluded that preparation time was needed to be given before the interviews were to be held, in order to receive answers of a high quality. Adding to this, although the sourcing buyers are facing ERR in their daily work, the authors deemed it possible that they did not connect it with the field of managerial capabilities in a large sense, leaving room for potential confusion would they not have been given the time to prepare. Additional interviews and follow-ups have been engaged in as well, by using unstructured interviews in order to gather the sought for and adequate data, these are however not included in Table 2.2 below as it primarily represents the main interviews held. All of the interviews were recorded and notes were also taken during all of these, by the authors, as approved by all of the interviewees. Furthermore, based on the literature review, the authors grouped the interview content into four categories: (a) the severity of ERR, (b) uncovering dilemmas and various management of fluctuations, (c) working with reducing the obstacles of ERR, and (d) a focus on knowledge in ERM. Furthermore, the authors transcripted the interviews and sent the transcriptions individually to all interviewees for approval, giving them room to also add or change the information in case of misunderstandings. The details of the interviews are listed as below:

Job Title	Date	Type of Interview	Topics & Key content
Senior sourcing buyer, Person A	2016-12-22	Unstructured	Background, initiation
Senior sourcing buyer, Person A	2017-01-18	Unstructured	Scope, objective
Senior sourcing buyer, Person A	2017-02-03	Unstructured	Project review
Senior sourcing buyer, Person A	2017-02-10	Unstructured	The global sourcing process
Senior sourcing buyer, Person A	2017-02-17	Unstructured	The current methods to manage ERR
Senior sourcing buyer, Person A	2017-02-24	Unstructured	Additional interview about ERM Methods

Senior sourcing buyer, Person A	2017-03-03	Unstructured	Suppliers selection process and information about purchasing orders
Senior sourcing buyer, Person A	2017-03-10	Unstructured	Increasing purchasing costs related to currency in different scenarios
Senior sourcing buyer, Person A	2017-03-13	Unstructured	Additional interview about purchasing currency in six purchasing regions
Senior sourcing buyer, Person C, located in the U.S	2017-03-17	Semi-structured	Interview about ERR, dilemmas of ERR, abilities needed to work with ERM and the aspect of knowledge in ERM
Senior sourcing buyer, Person D, located in China	2017-03-23	Semi-structured	Interview about ERR, dilemmas of ERR, abilities needed to work with ERM and the aspect of knowledge in ERM
Sourcing buyer, Person E, located in India	2017-03-28	Semi-structured	Interview about ERR, dilemmas of ERR, abilities needed to work with ERM and the aspect of knowledge in ERM
Sourcing buyer, Person B, located in India	2017-04-03	Semi-structured	Interview about ERR, dilemmas of ERR, abilities needed to work with ERM and the aspect of knowledge in ERM
Senior sourcing buyer, Person A, located in Sweden	2017-04-07	Semi-structured	Interview about ERR, dilemmas of ERR, abilities needed to work with ERM and the aspect of knowledge in ERM

Table 2.2, List of Interviewees, Dates of the Interviews, Type of Interview and the Main Content, Authors Creation

2.4 Data Analysis

The authors separately elaborate findings of every case subject in the empirical findings chapter, in order to simplify for the reader, in creating a better overview of who said what and, then, to better present the different viewpoints regarding ERM.

After collecting the empirical findings, the authors coded these into different themes based on the literature reviews and gathered data, as coding is one of the most important processes in data analysis, serving as "*shorthand devices to label, separate, compile and organize data*" (Bryman & Bell, 2011. p.578). The line of action taken by the authors here was repeated reviews of the transcriptions of all of the interviews and field notes, combined with secondary data which was collected through internal and official company documents, to be able to possibly sort the data in a good manner.

Furthermore, constant comparison, which refers to "*a process of maintaining a close connection between data and conceptualization*", was adopted in this part of the data analysis (Bryman & Bell, 2011. p.577), where the authors constantly compared differences and similarities in opinions of ERM capabilities in MNCs and the earlier research which had been collected in order to figure out the social reality in the fixed context. Here, the risk of being too "*impressionistic and subjective"* (Bryman & Bell, 2011, p. 408) in one's qualitative research approach was taken into consideration. Whereas the fact that the authors did not possess related experience in the topic when initiating the research is arguably a factor which may have reduced the level of initiatives from the author's side to attempt to sort out what information was significant and what was not. By this notion, it was decided by the authors that the judgement of what would be viewed as important, and in contrast, less noteworthy during the interviews was shifted to the actual interviewees to the largest extent possible. The interviewees got to speak freely and were given the time to put their own "label of grandness" onto the topics. Later in the process, however, following the interviews, secondary data helped the authors in their data analysis to add to, and confirm, the factors brought forward. The process was, again, characterised by being somewhat iterative (Bryman & Bell, 2011), where the authors then went between the theoretical framework and the data, which proved to be quite time consuming, however necessary. Also, taking it by and large, the authors read and attained confirming data not only from the practical experiences of the interviewees and the secondary data, but also from rigorous exploration of earlier academic research.
Furthermore, early on in the process, before conducting the interviews, the authors thoroughly discussed and formed ways of assessing the interviews in a more systematic way, which may have contributed to reducing the risk of being too "*impressionistic and subjective"* (Bryman & Bell, 2011, p. 408) as well.

Further, when analyzing the data, the authors did not emphasize on any aspect, e.g. difference, based the location of the sourcing buyer, other than to the extent of when an interviewee lifted the location aspect as important in terms of a specific sourcing scenario.

2.5 Quality of Research

With an ambition of supporting the research question with valid evidence, the research must be assessed by different criterias in order to ensure the reliability and validity (Bryman & Bell, 2011). Some research proposed that there is an alternative for assessing the quality of a qualitative research, which is based on two major criteria: *trustworthiness* and *authenticity*. Trustworthiness consists of the four following criteria (ibid):

- Credibility
- Transferability
- Dependability
- Confirmability

2.5.1 Trustworthiness

2.5.1.1 Credibility

Credibility needs to be established to ensure that the findings of a research are trustworthy and believable (Bryman & Bell, 2011). To affirm the credibility in this master thesis, the authors have explored the existing academic studies related to this area, where the vast majority of these articles was chosen from journals listed in the Academic Journal Guide 2015 of Association of Business Schools so as to ensure authority and trustworthiness. Also, the authors interviewed five experienced sourcing buyers, whereas three of them were senior sourcing buyers, who frequently have been facing the ERM dilemmas during their regular global sourcing activities. Triangulation and member checks also serve as common methods to address credibility (Bryman & Bell, 2011;Merriam & Tisdell, 2016), where triangulation, as presented by Bryman and Bell (2011) was applied throughout the process in the gathering of data from different sources by using different methods.

Further, the authors designed the interview questions and provided the different interview participants with the same question list, where member checks then were used when the interviewees were asked to review the gathered data and researcher's' own interpretation of the interviews (Merriam & Tisdell, 2016). In that way, all of the interviewees were given a chance to verify and review their statements, in case anything needed to be changed due to any misunderstandings.

2.5.1.2 Transferability

Qualitative research is usually engaged in small groups, therefore the findings tend to be orientated to the fixed context (Bryman & Bell, 2011), where, in terms of this research, exchange rate risk is a common issue in global activities and all MNCs conducting global sourcing activities face this dilemma. In terms of transferability, the main difference between other contexts is however then the existing ERM methods used by these other MNCs, where some may make fully use of financial derivatives to successfully eliminate currency risk whilst others may not. From this point of view, one downside of the conducted research, in terms of transferability, is that the data from the same department of one MNC proves as limited. Conclusively, other descriptive data on applied methods, from different MNCs, is needed, however, ERR reducing measures is only a part of ERM, which refers to the package of managerial capabilities. Therefore, the findings are partly likely to transfer to other MNCs, in terms of possessing and transferring capabilities.

2.5.1.3 Dependability

According to Lincoln and Guba (1985), dependability is considered as a cornerstone of reliability for a qualitative research approach, consequently, in order to heighten the dependability, the authors kept a tight record of every part of information, or impression, which was attained throughout the entire process. In doing so, the authors kept protocols of their own reflections, question formulations, answers to these questions, as well as data and data analysis, consistently during all of the meetings. This includes both the unstructured interviews and the semi-structured interviews with the case company and the individual interviewees, as well as the meetings with the supervisor awarded at the school.

The majority part of these meetings were also recorded, either through voice recordings or video recordings, in order to reduce the risk of leaving behind important parts of the collected data for the analytical processes to come further down the timeline of the research. Overall, these thorough procedures assured that the risk of losing essential information for the research conducted was reduced consistently throughout the process.

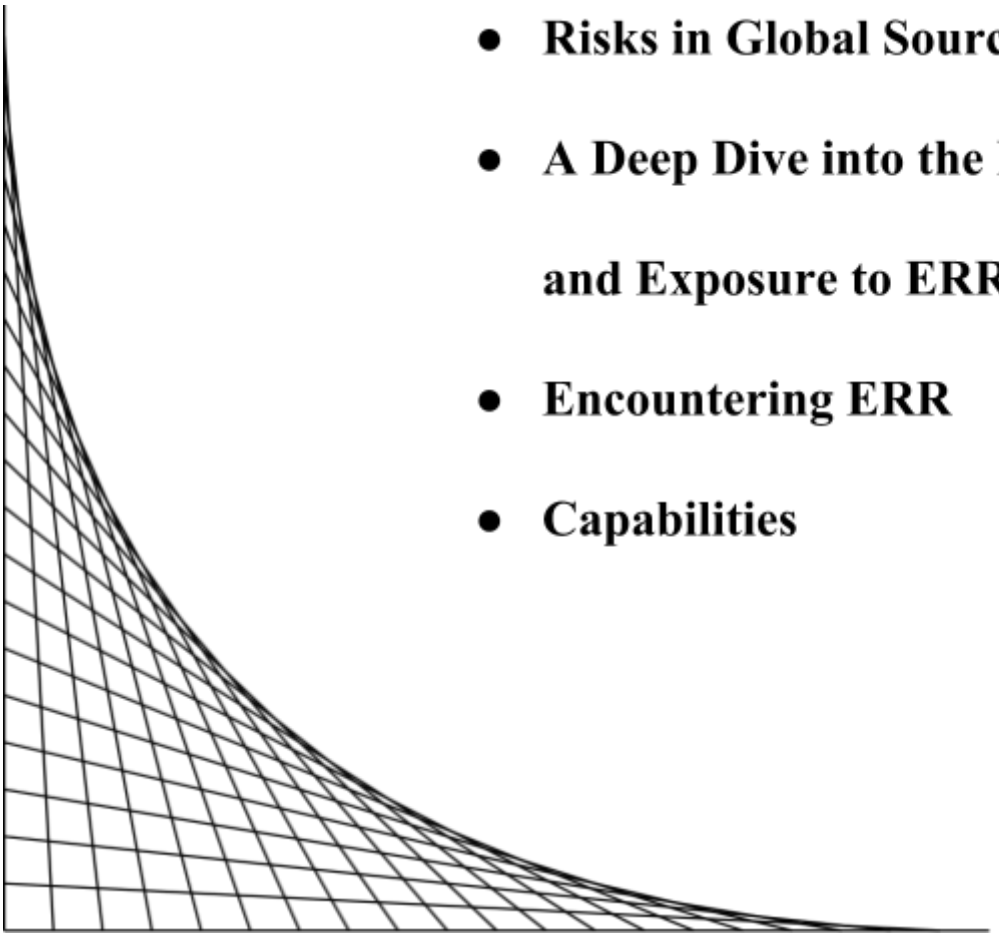
2.5.1.4 Confirmability

Confirmability is a certainty that the research process and its findings are not interfered by the researcher's personal values, prejudices or theoretical inclinations (Bryman & Bell, 2011). Preceding the conception of this research work, the authors had no previous experience in this area. This implies further that the author's lack of knowledge also applies to potential various personal opinions on this topic; possibly reducing the risk of interference by personal prejudices in a potentially biased way. It can through this be implied that information obtained from the sources at the case company consequently ran a bigger risk of being taken for the absolute truth. This risk was however dealt with by the authors through taking a highly analytical stance, as aforementioned, complementing the data with earlier research and official company data from secondary sources throughout the process. Although the academic articles produced by earlier research in ERM, carried out from a financial and international business interactive perspective are limited, the authors reviewed a larger number of related research, from which they assessed articles regarding ERM from both of the two perspectives.

2.5.2 Authenticity

Authenticity is the second criteria to evaluate the quality of a qualitative study (Bryman & Bell, 2011), whereas in this research, the interviewed sourcing buyers were given the chance, and had the personal ability to fairly present their opinions during the interviews. Also, several buyers were interviewed anonymously, providing the research with multiple viewing points and increasing the chance of the subjects giving their honest opinions. By doing this, the interviewees were then more likely to provide more authentic and fair impressions and conclusions on the topics.

3. Theoretical Framework



- **Risks in Global Sourcing**
- **A Deep Dive into the Risks and Exposure to ERR**
- **Encountering ERR**
- **Capabilities**

This chapter provides a theoretical framework for the reader to grasp what has earlier been researched in the related topic, and also for the authors to later apply in the analysis chapter. Initially, global sourcing and risks in global sourcing are presented to offer an overall background. The authors, furthermore, elaborate on ERR and the existing instruments which can be applied to manage the risks, including both external and internal methods. Lastly, capabilities of MNCs and its relationship with ERM are also presented.

3.1 Risks in Global Sourcing

Monczka and Trent (1991) regard global sourcing as the ultimate stage of the evolution of the sourcing strategy, where the MNC seeks to integrate foreign sourcing into its overall sourcing strategy, defining global sourcing as "*the integration and coordination of procurement requirements across worldwide business units, looking at common item, processes, technologies, and suppliers"* (p. 3). As time goes by, sourcing strategies of the MNCs' are however encountering opposition in the growing threats of the gradual emergence of different risks throughout the sourcing processes (PrasannaVenkatesan & Kumanan, 2011). The risks may result in unanticipated cost increases, profit shrinkage and the loss of market share (ibid). These multifaceted risks associated with global sourcing activities are in the literature also referred to as supply chain risk or supply-side risk (Zeng et al. 2005), and they come in numerous shapes and forms in existing theory (Harland et al., 2003;Zeng et al., 2005;Tang, 2006;Samvedi, 2013). Ho et al. (2015, p.5035) however present a comprehensive definition, useful in order to clarify the width of the term supply chain risk: "*the likelihood and impact of unexpected macro and/or micro level events of conditions that adversely influence any part of a supply chain leading to operational, tactical or strategic level failures or irregularities*". In this thesis, we have merged the diverse classifications found in existing the literature into four main risk clusters - capacity limitation, disruptions and delays, techonology incompatibility and exchange rate fluctuations, where the main focus in this thesis, the exchange rate fluctuations, is visibly enhanced in the figure 3.1:

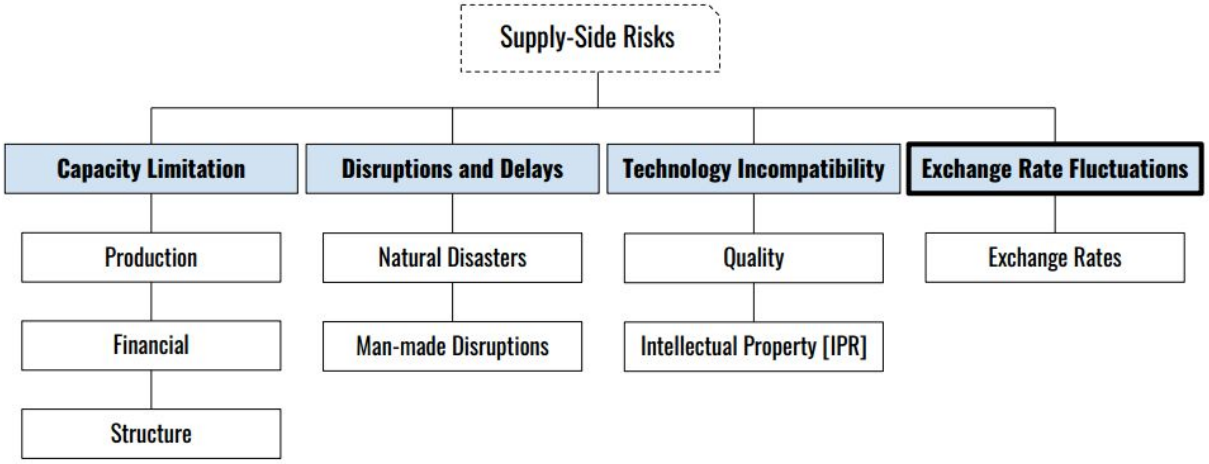


Figure 3.1, Supply Side Risks, Based on Harland et al., 2003, Zeng et al., 2005, Tang, 2006, Samvedi, 2013

Firstly, the capacity limitation refers to the restricted ability to adapt fast changing demands (Zsidisin et al. 2000), which may also be called production risk, defined as the lack of ability to adjust optimal output according to customer's needs (Lin & Zhou, 2011). However, capacity constraints are not only restricted to suppliers' productive capacity, as financial and structural constraints are also taken into consideration (Cucchiella & Gastaldi, 2006). Where, from the financial aspect, a firm may underestimate the product's market value. Whilst the other aspect linked to capabilities is of a more structural sense, where the network might encounter issues in producing and, or, marketing the product due to infrastructural inadequacy (ibid).

Going into the second category, late delivery of any component from the suppliers is certainly a contributory factor in generating negative consequences for the MNC, as for example delaying an important product launch (Sodhi & Tang, 2012). These consequences not only risk causing customer dissatisfaction and a loss of profit due to financial penalties, but also have an adverse influence on the long-term market share (ibid). Disruptions that cause delays can be divided into two kinds - natural and man-made disasters (Sodhi & Tang, 2012), where natural disasters refer to earthquakes, flood, tsunamis, etc. and man-made disasters include wars, terrorist attacks, strikes, war, political and economical instability, etc. (ibid).

Thirdly, technology related risks in supply chain management can be classified as quality risk and intellectual property risk (IPR), where, for example, poor quality can pose a serious risk, rippling down the supply chain (Zeng et al. 2005). Since the sourcing strategy of MNCs more and more has shifted from a vertical integration to the more global, the risk of intellectual property has gained more and more attention (Sodhi & Tang, 2012). IPR is considered as having a long-term dynamic impact on the profitability of MNCs, since the profitability depends on if a company can keep its edge in the competitive market (Chopra & Sodhi, 2004).

Lastly, the impact of volatile exchange rates in the purchasing process stems from a time lag between the point a purchasing contract is undersigned to the point when payment de facto is made (Carter & Vickery, 1989). Regardless of currency decided upon in the contract, this time lag gives the currency rate room to fluctuate, resulting in the buyer paying either considerably more or less than the price decided upon in the contract (ibid). Defined through the volatility of currency rates (Clark & Marois, 1996), naturally, currency risks are of both a short-term and long-term nature, impacting a firm's business transactions, where exchange rate fluctuations often are visualized in the organization's financial results, overall value and cash flows (Eun & Resnick, 2007).

3.2 A Deep Dive into the Risks of and Exposure to ERR

Risk and exposure to foreign exchange (FOREX) generated by unexpected fluctuations in currency rates is a multileveled challenge, for both domestic and internationally sourcing companies (Adler & Dumas, 1984). The exposure to ERR is not only described through a short- and long-term spectra, but also with the characteristics of being both indirect as well as direct (see figure 3.2 below) (Sarkis & Shu, 2008).

In order to clarify the different magnitudes of ERM in MNCs, a distinction needs to be made between the two terms *risk* and *exposure*. Adler and Dumas (1984) provide a framework for how to divide *risk* from *exposure*, where risk is defined as a factor of a random character and exposure links to the share of what you possess that is at risk.

Firstly, in accordance with the risk definition by Luption (1999) where risk is seen as an event which deviates from the expected, Adler and Dumas (1984) emphasize that, indeed, it is when unexpected changes occur risks arise. In line with this, ERR might to some extent be identifiable in statistical quantities, seen to "*the probability that the actual domestic purchasing power of home or foreign currency on a given future date will differ from its originally anticipated value."* (Adler & Dumas, 1984, p.42). Secondly, expected currency changes might then be foreseen through probability, and to some extent hedged for, but the firm's exposure to ERR however might be more intricate to measure and is defined as:

"The amounts of foreign currencies which represent the sensitivity of the future, real domestic-currency (market) value of any physical or financial asset to random variations in the future domestic purchasing powers of these foreign currencies, at some specific future date." (Adler & Dumas, 1984, p.42)

Naturally, exposures alter over time along with the firm's sensitivity to exchange rate fluctuations (He & Ng, 1998;Adler & Dumas, 1984). Overall, the sensitivity to movements in exchange rates is dependent on numerous parameters, not only the level of foreign operations, but also the nature of all business activities, the organizational structure of export and imports and how competitive the firm's markets of output and input are, alongside with the currency classifications of its suppliers and competition (Muller & Verschoor, 2006). Another factor is the time perspective, where the sensitivity and amount of risk exposure only is determinable with regards to a definitive time period (Dumas, 1978). This is due to the exposure being directly conditional upon the firm's commitment horizon, along with the fact that financial instruments practically applied in hedging efforts have set contractual maturity dates (Adler & Dumas, 1984). Moreover, summarizing Dumas' (1978) theories on the total exposure of the firm, this always will remain uncertain, since it is contingent upon future currency rate movements, the firms behavior and macroeconomic effects. Arguably the majority of companies are exposed to ERR, however in some instances the impact is more clear and noticeable than in others, also indicating the challenge of identifying and measuring the exposure on different case to case basis (Bennet, 2003).

The effects of the exchange rate fluctuations might be seen in the current operational year's accounts if the organization have a direct risk exposure, whilst it may not be visible until further down the line if the firm faces an indirect risk exposure (ibid).

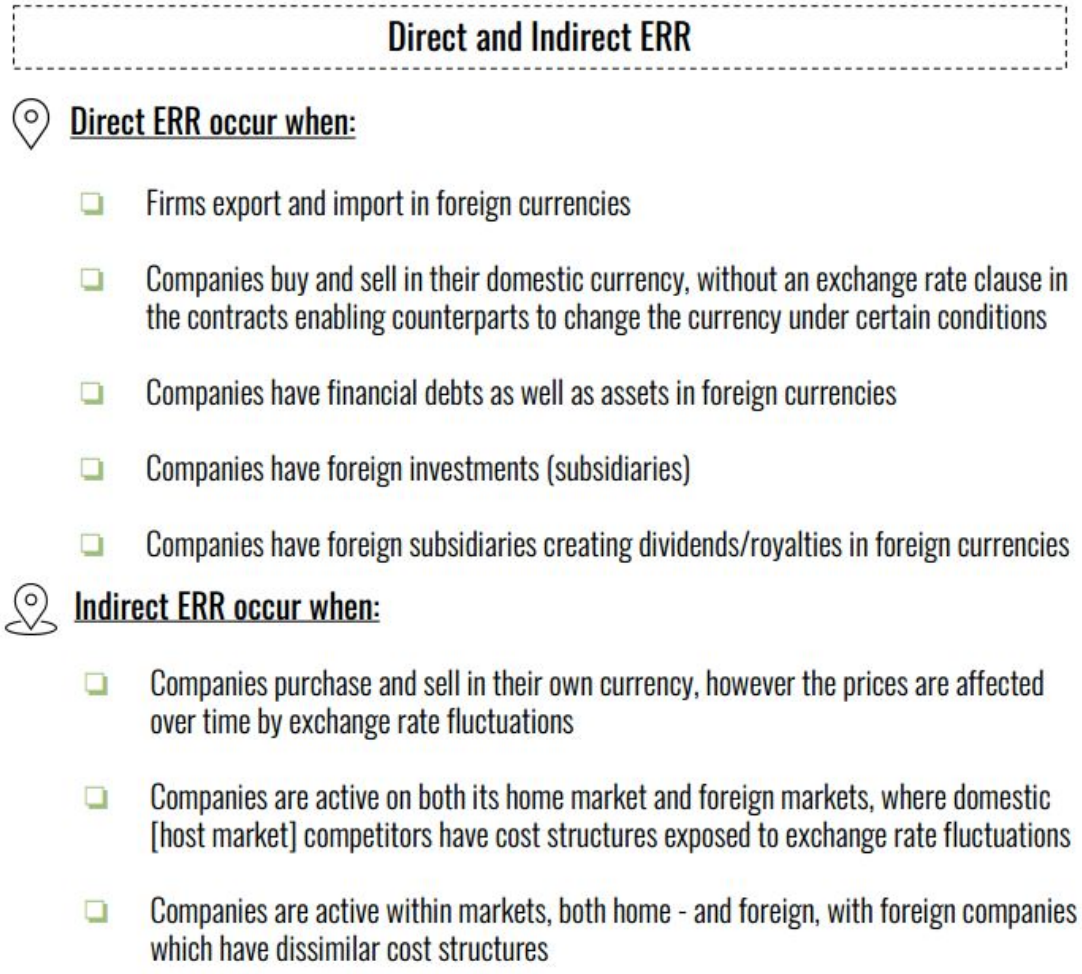


Figure 3.2, Direct and Indirect ERR, Based on Bennet (2003, p. 163)

3.2.1 The Building Blocks of ERR

Moving forward, identifying the different types of risks (defining the direct and indirect ERR) the organization might be exposed to, and the encountered level of risk, is imperative (Hakala & Wystup, 2002). Earlier research presents three major exposures of ERR, which will carry a focus in this paper, namely, *translation exposure, economic exposure* and *transaction exposure* affecting firm value (see Figure 3.3) (Shapiro, 1996;Papaioannou, 2006;Eun & Resnick, 2007).

Taking Adler and Dumas (1984) aforementioned distinction between *risk* and *exposure* into consideration, the following components of exposure to ERR are in the following parts of this paper to be viewed as the risks a company encounters in their total exposure of the firm.

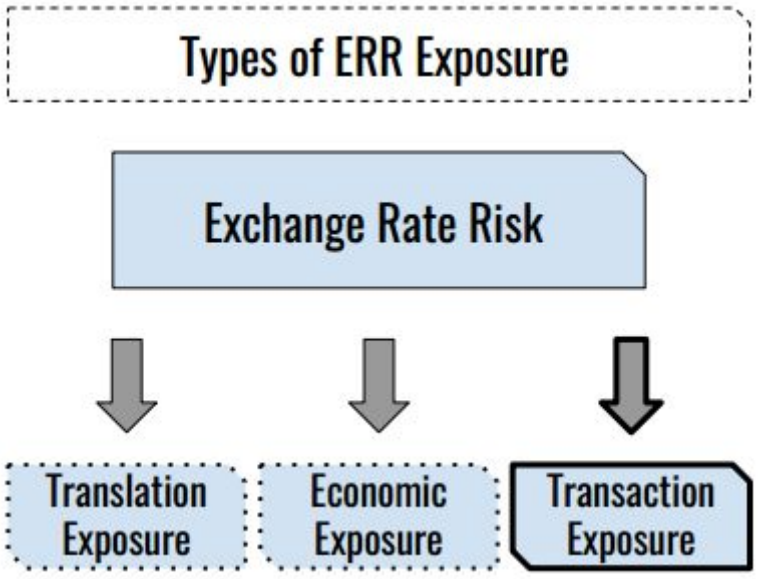


Figure 3.3, Types of ERR Exposure, Based on Eun and Resnick (2007)

3.2.1.1 Translation Exposure

If the organizational structure is characterized by a parent consolidating foreign subsidiaries, said parent needs to translate both the liabilities and assets of those, which might be stated in a different currency, into the denominated currency of the parent (Butler, 2004). This procedure then entails encountering ERR in the financial statements, when adding and translating foreign currencies into the income statement and balance sheet of the parent (Eiteman et al., 2007).

For the foreign subsidiary, translation risk is customarily measured through its net assets' exposure (assets less liabilities) to probable market changes in exchange rates (Papaioannou, 2006). When consolidating, the parent either perform the translation at the exchange rate in the end of a specified period or use a period average exchange rate. In summary, the actual realization of this risk is shown in the valuation of the subsidiaries and consolidation of the same (Eun & Resnick, 2007).

3.2.1.2 Economic Exposure

Economic risk is the most dynamic exposure of the three building blocks (Bennet, 2003), representing "*the risk to the firm's present value of future operating cash flows from exchange rate movements*" (Papaioannou, 2006, p.131). Elaborated, this type of exposure applies to the impact from movements in the exchange rates on the firm's exports and all domestic sales (i.e. revenues) and all of its costs of inputs, domestically, as well as imports (i.e. operating expenses) (Papaioannou, 2006). Thereupon, this type of exposure is comprehensive, denominated by Bennet (2003) as the most complicated one, shown by its multidimensional characteristics.

3.2.1.3 Transaction Exposure

This type of risk is directly related to the company's cash flows, reflecting the organization's vulnerability through transactions it has already entered into (Stulz & Williamson, 1997). More specifically, accounts receivables, such as export contracts and accounts payables, alongside with repatriations of any dividend is at risk here, given that they are designated in a foreign exchange rate (von Ungern-Sternberg & von Weizsäcker, 1990;Marston, 2001;Papaioannou, 2006). If a movement in the exchange rate decided for in the contract occurs, it will subsequently lead to a transaction risk to the organization (Papaioannou, 2006). In comparison to translation exposure, this type of risk exposure relates to the loss and profit narratives of the firm, whilst translation exposure concerns values and its effects on elements in the balance sheet of the firm (Eiteman et al., 2007). According to Butler (2004), this type of exposure is the most visible one to exchange rate risk, and it is also the one commanding the greater managerial attention from the financial managers of the firm. The figure below concludes the drivers of transaction exposure (Eiteman et al., 2007):

Figure 3.4, Drivers of Transaction Exposure, based on Eiteman et al. (2007)

If the firm has a receivable, or payable, which is denominated by a foreign exchange rate, the exposure met consists of i) quotation exposure ii) backlog exposure iii) billing exposure (see Figure 3.5) (Eiteman et al., 2007).

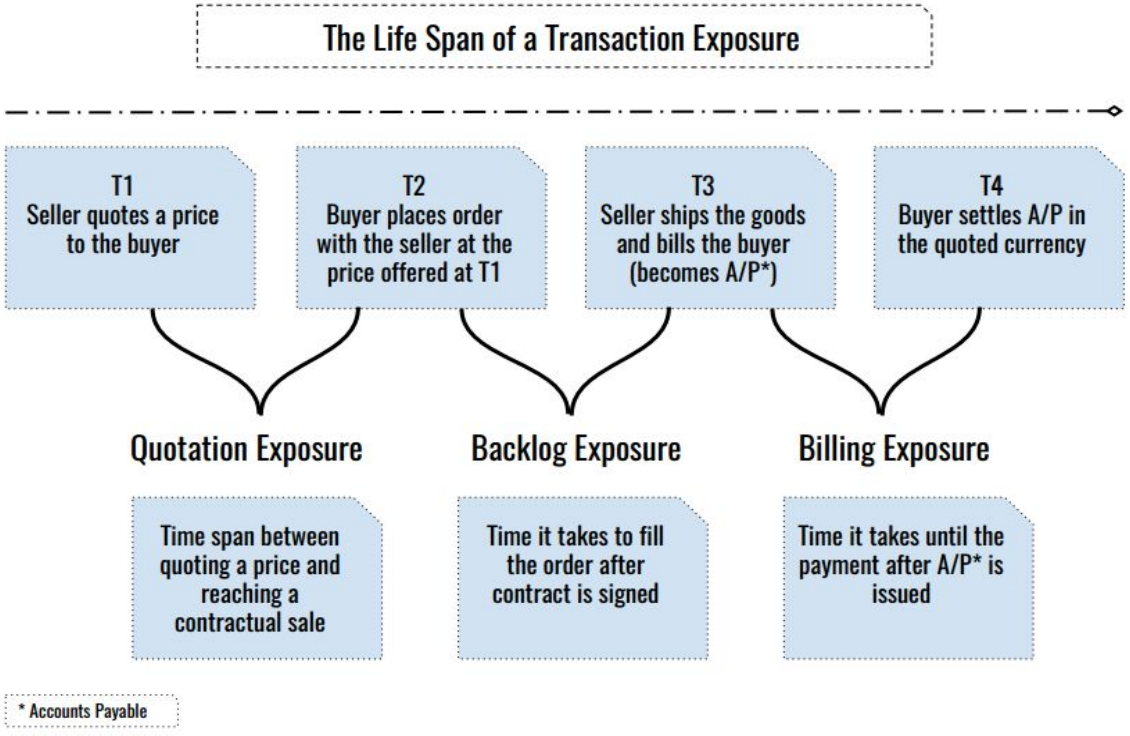


Figure 3.5, The Life Span of a Transaction Exposure, Based on Eiteman et al. (2007)

Reviewing figure 3.5 above, the exposure is conceived at the point when the supplier quotes in a foreign exchange rate to the buyer (T1). As the order is placed, the exposure which was generated at the time of the quotation, has been transformed to a backlog exposure (T2).

This second exposure endures up until the point when the goods are billed (T3), where it converts into the third type of exposure, billing exposure, which then will prevail until the buyer makes the payment (T4). (Eiteman et al., 2007)

3.3 Encountering ERR

Theoretical models on how to handle ERR, through means of ERM, throughout the MNCs sourcing processes of both small and large organizations stem mostly from the finance field, presented by authors such as Bennet (2003), Butler (2004) and Eiteman et al., (2007). When the MNC has identified the ERR and exposure associated with it, the organization ought to determine whether to hedge (i.e. put forward a strategy appropriate to manage ERR) them or not (Allen, 2003). Now, depending on the pervasiveness of the specific ERR prevailing, alongside with the the firm size and abilities, corporate treasurers have several models to put to use, both internally and externally (ibid), as will be presented below.

3.3.1 External ERM Strategies

In order to reduce transaction risks, external financial derivatives are presented, focusing on the ultimate principle and the usage of speculative purpose currency forward contract (Eiteman et al., 2007). There are three widely used currency derivatives related to sourcing activities: currency forward contracts, currency futures and currency options.

3.3.1.1 Currency Forward Contracts

Currency forward contracts (CFC) serve as an external method to mitigating ERR when a company will pay or receive an amount of foreign currency payment in the future (Eiteman et al., 2007). Basically, CFC is an agreement between two parties, generally an exporter and the bank or an importer and the bank. The banks usually provide short-term and long-term CFC in different currency rates. Under CFC, two parties agree to convert a fixed amount of foreign currency by a pre-fixed currency rate, at a pre-fixed future date. By using CFC, it is possible to eliminate currency fluctuation by locking into the exchange rate on the settlement date. However, it is worth noting that the company can not receive any gain when the currency trend move to its favor, since the exchange rate is locked at the transaction (ibid).

CFC includes two types: Outright Currency Forward Contract and Non-deliverable Forward Contract (Adams et al, 1999) Numerical examples of the two types of CFC are presented in Appendix III.

3.3.1.2 Currency Futures

Currency futures is an agreement to deliver a standard amount of a specified foreign currency at a predetermined date, standard place and an agreed price (Eiteman et al., 2007). A numerical example is presented in Appendix III. In order to have a rich understanding of currency futures, the main characteristics of currency futures are listed (Klein, 2001):

- Currency futures must be traded on the future change.
- Each currency future has a standard size set by the future change.
- Currency futures can be liquidated at any time before the last day of the future.
- Currency futures require 5% - 10% payment of the contract value as a deposit when the contract is signed, whereas CFC involves a single payment at the settlement date.
- The predetermined rate of future contract fluctuates on the future market, whereas the fixed rate of CFC is entirely locked down to the quotation spot rate.

3.3.1.3 Currency Options

A foreign currency option is a contract that gives the option buyer the right to buy or sell a fixed amount of the underlying currency at a predetermined price per unit before or on the expiration or maturity date (Eiteman et al., 2007). Notice that the option buyer is not obligated to buy or sell the underlying currency, the buyer only exercise the option if it is profitable. A company can exercise the option when the currency trend turns in disfavour of the company, whereas a company does not exercise the option when the currency trend turns in favour of the company. Currency options include two types: “calls” and “puts”. A call is "*an option to buy foreign currency*"; a put is "*an option to sell foreign currency*" (Eiteman et al., 2007, p.241). Numerical examples of the call and the put are presented in Appendix III.

3.3.2 Internal ERM Strategies

Internal ERM strategies serve as a tool used by a company that aims to mitigate the currency risk within the corporate network, without any interference from outside of the corporate (Sarkis & Shu, 2008). From the sourcing buyers' perspective, there are two internal strategies related to global sourcing activities: Currency Matching and Lead & Lag (OECD, 1999;Chandra, 2008).

3.3.2.1 Currency Matching

Currency Matching refers to a company matching a similar amount of outflows and inflows in the same currency at the same time period (OECD, 1999). The more a firm can match the two-way cash flows, the more it can eliminate ERR (ibid). For example, a sourcing company can make a payment to foreign suppliers in a specific currency by using the sales in that specific region in the same currency.

3.3.2.2 Lead & Lag

Another internal ERM strategy is leading or lagging a foreign currency payment (Chandra, 2008). Leading refers to making a payment early. If the payment currency is expected to depreciate, the sourcing company makes a payment early to avoid the loss from the depreciation, if the other party consents. Whereas, lagging refers to the contrary, namely, making a payment late. If the payment currency is expected to appreciate, the sourcing company makes a payment late to gain benefit from the appreciation, if the other party consents (ibid). It should be noted that this strategy demands the ability to forecast the currency movements indicating that related knowledge is required, such as factors that affect the movements .

3.4 Capabilities

3.4.1 Capability Creation and Transfer within the MNC

Combining the theories of Govindarajan and Gupta (2000) with Teece's (2014), *capabilities* are to be seen as best practices of which an MNC needs to carry out in order to survive. A capability can be developed in any part of the organization, and can, for example, entail a well-developed set of skills in communication, trust generation or conflict resolution and so on and so forth (Tyler, 2001;Ritter & Gemünden, 2003;Walter et al., 2006). Further on, in terms of not only aiming at organizational survival, but also on genuinely creating sustainable competitive advantage (SCA) against competitors, there is a clear distinction between *ordinary capabilities* and, so called, *dynamic capabilities* in previous theory (Teece, 2014). An ordinary capability is more easily replicated and transferred, indicating that its power to create an SCA is low, since competitors might more simply imitate it (ibid). Teece (2014) further argues that the special qualities and skills it takes, in coping with dynamic capabilities, are more aligned with generating exclusive problem-solving techniques and key success processes, making them difficult to imitate. Additionally, not until the point when the dynamic capabilities of a firm are well-matched to the organizational strategy however, an organization has the ability to preserve its superior firm achievements, in a fast- and ever changing global arena (ibid). Narrowing down the perspective even more onto capability transfer, it implies that when knowledge is shared, a set of capabilities has been shared, within the context of an interorganizational "network" of different business units (Gupta, 2006). Since MNCs are highly complex, through their multidimensional structures, the direction of knowledge flows within these types of organizations do not only occur along multiple routes but across numerous dimensions as well (Govindarajan & Gupta, 2000). Forenamed knowledge flows include a wide range of knowledge, including procedural knowledge, declarative knowledge, best practices and so on (Govindarajan & Gupta, 2000;Haltiwanger, 2012).

Linking the theories of Kogut and Zander (2003), on the capability of knowledge generation and conveyance, to Teece's (2014) description of dynamic capabilities, a well-developed and performed transfer and coordination of ordinary capabilities might also, in itself, be a dynamic capability and therefore an important factor for organizational success. Consequently, Kogut and Zander's (2003) view on the MNC as a social community latches onto Govindarajan and Gupta's (2000) theories on how the crude ability of exploiting and transferring knowledge effectively and efficiently within a corporate network is critical in order for an MNC to even exist. Additionally proposed by Kogut and Zander (2003), is that the basic notion of simply understanding and applying knowledge is in itself a capability which allows for an organization to grow. For this however to stay true, new knowledge has to be created and then transferred in a way that is more effective than how competitors are performing it. The transfer mode is accordingly decided upon how efficiently the MNC can transfer knowledge within its network, as opposed to other organizations. Reasonably, as organizations are characterized by differences in what manner information is encoded and transferred, one common denominator between all organizations is that their capabilities (i.e. skill-sets) of understanding, as well as applying, knowledge differs. In the end, competition is fixed upon the differences in possession of capabilities, alongside with the speediness and innovativeness in the way these are transferred within the corporate network (ibid).

3.4.2 The Relationship Between ERM and Capabilities

When sourcing internationally, the risks of fluctuating exchange rates become an inherent part of the supply chain process (Carter & Vickery, 1989;Muller & Verschoor, 2006). The actual managerial impact can be found in the various decision making processes throughout the firm, such as the need for adjusted purchasing schedules and, or, purchasing volumes, alongside with re-consideration of the geographical spread of its supplier network (Muller & Verschoor, 2006). Since poor ERM may lead to substantial losses, ERR are characterized by their *financial risk* to the firm which, consequently, requires organizations to structure and restore effective management routines in their procurement functions (Suranovic, 2005;Muller & Verschoor, 2006). For example, the responsibilities of managers entail an ability to promptly recognize risks and consequently identify ways to manage them (Wang, 2015).

As the risk management skills of a firm is a capability, developing greater knowledge sharing finesse also then has a positive impact on a firm's overall risk management capabilities (Haltiwanger, 2012). General theory on knowledge creation and transfer states, if managers manage to create a platform where employees can combine newly absorbed knowledge with the existing organizational knowledge, a combinative capability within the organizational network is created, which simplifies further resource augmentation of the entire organization (Kogut & Zander, 1996). Would this resource augmentation then give rise to unique processes and problem solving capabilities, in terms of risk management for example, within the organizational network, then, these dynamic capabilities which have been created in accordance with Teece (2014) will reduce the risk exposure of the MNC in total. This is a crucial point in linking risk management to capabilities and their transferability. An actual lack of knowledge, in a firm's internationalization process for example, constitutes one of the largest constraints for an MNC (Johanson & Vahlne, 1977, 2009), so the case of poor capability (knowledge) transferability entails as much risk of damage to a company's ability to succeed. Moreover, in terms of risk management, and genuinely all business processes, the actual perception gap of knowledge is growing alongside with the growth of international information platforms (Figueira-de-Lemosa et al., 2011). This indicates that the more knowledge an organization acquire, the more the management's perception of its inadequacy of possessed knowledge grows (Jonsson & Foss, 2011). If an organization has an adequate capability architecture, indicating a sound portfolio of capabilities, and a well expressed line-up of what capabilities are accessible in all teams of the organization (Vesalainen & Hakala, 2014), this risk of manager uncertainty might be mitigated. Additionally, since exchange rate fluctuations may have a substantial effect on the overall firm valuation and the cash flows, along with the settlement procedures of contracts, it is excessively important ERR gets properly managed in the sense of stabilizing firm cash flows and enhancing firm value (Eun & Resnick , 2007).

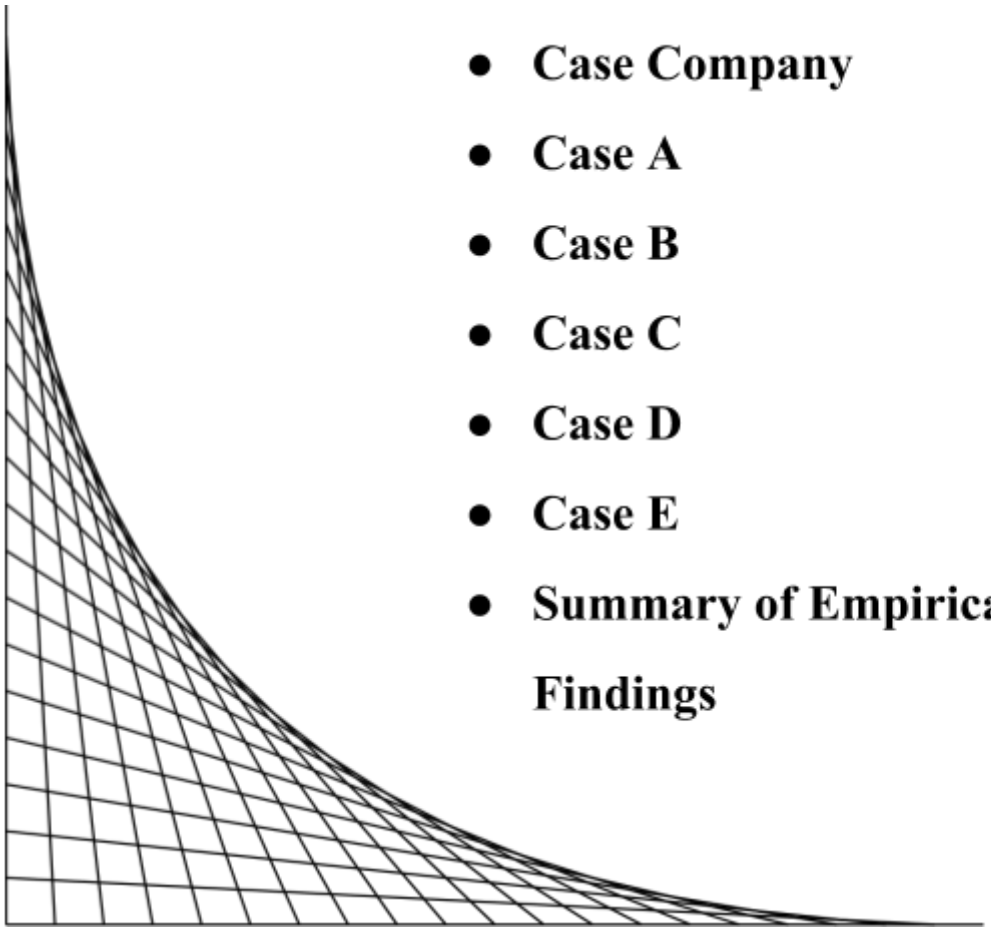
Holweg et al. (2011) emphasize on exchange rates unstable character by extending ERR into the theoretical category known as *hidden costs*, where indirect costs (to the supply chain of an MNC) materialize due to inescapable alterations in the global environment surrounding an MNC which are challenging to anticipate.

These types of costs, building on the theories of Jüttner et al. (2003), are placed into a category called *environmental uncertainties and risks*, where volatile exchange rates are pinpointed in the actual interaction between an MNC's external environment and its global supply chain. Hidden costs increase with the supply chain configuration complexity, also resulting in a heightened management complexity (Larsen et al., 2013) demanding well-developed capabilities, arguably in the form of Teece's (2014) dynamic capabilities in terms of problem solving skills. As put forward by Argyres and Mayer (2007), specific capabilities in, for example, contract design tasks might aid firms to anticipate, as well as manage, these types of costs which otherwise would have been outside of the manager's immediate control. In line with the example of contract design capabilities, which might be placed as a piece into the ERM capability, other risk management strategies are of essence. Lee (2004) puts forward the *Triple-A* strategies, known as *alignment*, *agility* and *adaptability*, where important types of managerial knowledge and focus can be of great aid in the supply chain risk management efforts. Additionally, as it is crucial for MNCs to analyze exposures and mitigate potential risks, and thereby better the configuration of their global sourcing (Cook, 2007), these Triple-A strategies may be argued to grow in importance. Firstly, the principle of *aligning* is focused on reducing risks through merging the interests amongst the different parties of the supply chain, through cooperation, collaboration and a close communication, why a long-term focus and trust building is crucial (Sodhi & Tang, 2012). Secondly, *agility* targets the need for managerial responsiveness and flexibility, where a buyer, for example, should develop the capability to seamlessly shift from one supplier to another who is located in another geographical region (Lee, 2004). Here, the supplier selection process, or the configuration of one's global sourcing, is considered as a virtual part of the strategic decision-making, which has to be in accordance with the MNC's overall strategic goals (Bross & Zhao, 2004). The actual selection process is best determined by multiple criteria and subjective assessments (ibid), where explicit and suited selection criteria can help define the role and responsibility of the suppliers, thereby providing guarantee for the outcomes (Nair et al., 2015).

There are plenty of research articles exploring what the right criterion for supplier selection are, where Dickson (1966) listed 23 selection criteria, among which quality, delivery, performance history, procedural compliance and communication systems are chosen amongst the top 10 ones. Regardless of criteria behind the selection of the suppliers, in terms of ERM, to proactively build in a flexibility such as this (agility) into the supply chain network, management can increase the profit margins and reduce ERR through the ability of exploiting currency movements of different currencies (Kogut, 1985;Kogut & Kulatilaka, 1994;Sodhi & Tang, 2012). Thirdly, *adaptability* regards keeping a close eye on the surrounding, in order to respond with recovery plans in a time efficient demeanor (Sodhi & Tang, 2012). For example, in the scenario where one of the supplier regions faces currency devaluations placing the suppliers in a financial crunch, where they might have difficulties in paying for their production inputs, the MNC can deploy its shift capability (i.e. flexibility capability) well in time in order to not risk supply chain disruptions (ibid).

In all of these efforts, managerial comfort zones, presented by Jensen and Petersen (2013) in the global sourcing construct "transformational global sourcing", come into play, where managers may be forced to step outside of their previous frame of references and into something more unknown. As existing research in the field has shown, in terms of an organization with an intense global purchasing behaviour, some direct consequences in management practices arise when global sourcing decisions need to be adjusted due to risk minimization efforts (Hu & Motvvani, 2013). One of the first and basic challenges then relates to the intricate concept of managerial comfort zones, which in theory constitutes of the individual risk perception and tolerance characteristics of the managers, along with the management ability to engage in risk-reducing procedures. In sum, all of these strategies (*Triple-A*), which are linked to the construct of managerial comfort zones, are arguably, in the end, in line with Teece's (2014) dynamic capabilities, where a well executed transfer of capabilities (for example, an "agility capability") throughout the organization may be an important factor for organizational success.

4. Empirical Findings



- Case Company
- Case A
- Case B
- Case C
- Case D
- Case E
- Summary of Empirical Findings

This chapter gives a description of the empirical data gathered by the authors. The data serves as the base for the coming analysis chapter, therefore it is crucial for the reader to have a rich understanding of what the research question looks like in the real business context. The chapter is divided into five sections according to five interviewed case subjects. However, the sections have the same structure, which respectively includes the severity of ERR in global sourcing activities, uncovering dilemmas and various management of currency fluctuations, working with reducing the obstacles of ERR and knowledge in ERM.

4.1 Case Company

The case company is characterized by its heavily geographically dispersed sourcing and assembling activities, maintaining a broad and diversified global supplier network. The net sale of the case company was about 300 billion SEK in 2016, and the company spends around 78 billion SEK on purchasing activities every year. Brazil, America, Europe, India and Japan are five main sourcing regions for the case company, where the interviewed purchasing team of five all are located in different regions. Each one of the sourcing buyers is responsible for the sourcing of specific components for all of the case company's assembling plants. Therefore, exchange rate exposure frequently arise within these purchasing processes, as the assembling plants regularly order components from foreign locations. Below, a table of the five case subjects is presented:

Interviewee	Background
Jonathan Rodriguez [Case A]	A Sourcing Buyer, located in Sweden, responsible for purchasing specific parts for globally dispersed production plants.
Daniel Ancher [Case B]	A Sourcing Buyer, located in India, responsible for purchasing specific parts for globally dispersed production plants.
Tammo Jefferson [Case C]	A Senior Buyer, located in US, responsible for purchasing specific parts for globally dispersed production plants.
Sara Walker [Case D]	A Senior Buyer, located in China, responsible for purchasing specific parts for globally dispersed production plants.

Peter Murthy [Case E]	A Sourcing Buyer, located in India, responsible for purchasing specific parts for globally dispersed production plants.

Table 4.1, The List of the 5 Case Subjects, Based on the Collected Data

4.2 Case A, Jonathan Rodriguez, Senior Sourcing Buyer

4.2.1 The Severity of ERR

When the authors ask Rodriguez about his opinion on the actual importance of ERR, he explains that ERR is an extremely big risk, however emphasized the fact that the actual risk exposure is both faced and perceived differently, always, depending on the nature of the specific sourcing cases and responsibilities allocated to you. Another point which was made was that the case company heavily faces transaction exposure regarding their global sourcing activities, when entering into contracts with the suppliers which are usually on a 3 - 5 years term. He continues with emphasizing that there are a lot of risks associated with global sourcing efforts, mentioning quality risks and delivery risks, apart from ERR, as two of them. Naturally, quality assurance is seen as a crucial part of the supply chain, especially in terms of end customer satisfaction and product life lenght and security. Further, in terms of delivery risks, he speaks of pro-actively working towards mitigating these and always having backup plans if any disaster, such as a flooding at a supplier location, were to take place, as an important part of the responsibilities in the sourcing processes. He also adds:

"*Every one of these risks affect the company's cash flow in the end, making them extremely important to track and manage.*"

4.2.2 Uncovering Dilemmas and Various Management of ERR

Moving the focus back to the exposure to ERR, Rodriguez continues with explaining that, as the purchasing activities are performed individually from different sites of the world, this results in a large number of active currencies being used in the various sourcing cases (see figure 4.1 below).

By this notion, reviews need to be done on how the relevant currencies are moving at specific times. He states that even though this type of procedure takes up time and effort, it is a well needed task to perform in order to attain a clear picture on which currency is the better currency to buy in.

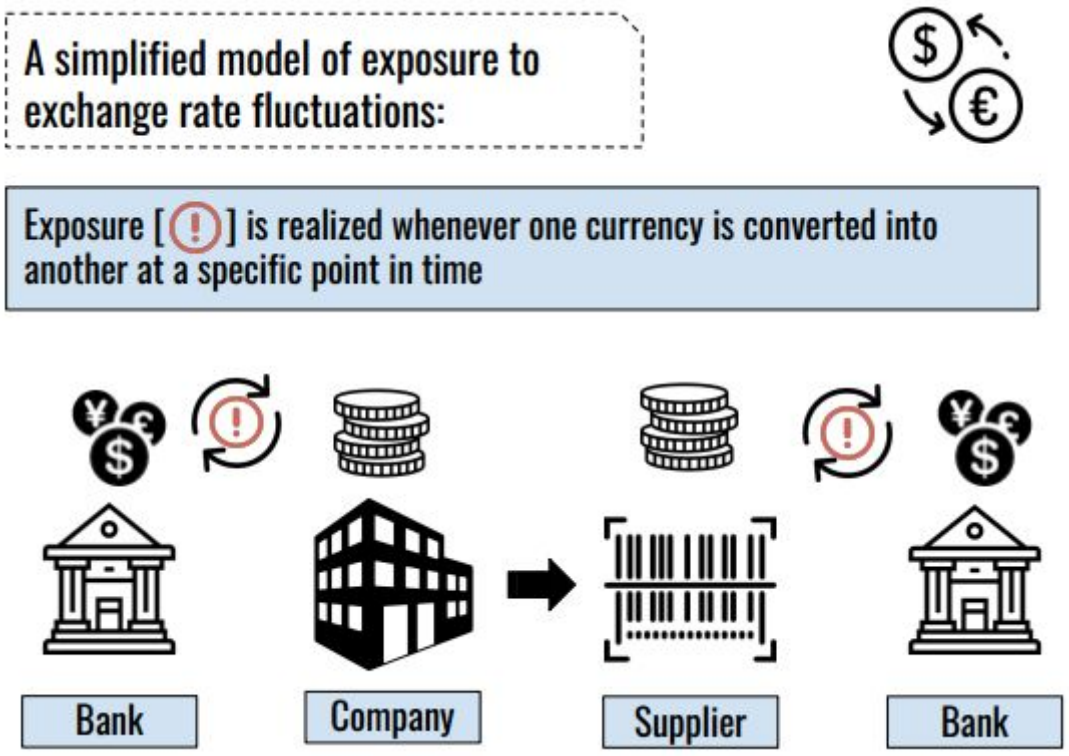


Figure 4.1, A Simplified Model of Exposure to Exchange Rate Fluctuations, Based on the Data Collection

Alongside this important exercise, assessment of which market is better at certain specific points in time is also crucial in regards to tracking the overall business segment's opportunities and weaknesses going forward. If a change in the supplier base is needed here, then this might impact the currency base of the company as well, as another market might entail a different local currency for the buyer to take into consideration. Rodriguez also adds that the head office and treasury is located in Sweden, resulting in all currencies in the end being translated into SEK, which in itself then is a matter of exposure which will never fully be mitigated. Going deeper into the subject of the company's supplier base, it yet again becomes clear how the suppliers are characterized by their own local currencies:

"The plants have their own currency, so everywhere they convert the local currency. Regardless if it is in EUR, SEK, USD or any other currency, what we pay can change on a monthly basis."

It is a long process of choosing suppliers, with a lot of involvement throughout different departments and manager levels, and in the end, there are a lot of factors which are decisive as to which supplier to go with, including the quality of the components and also, naturally, price per component. Except these two prior criteria, other factors, such as delivery requirements, financial status of suppliers, production capacity and previous performances are also needed to consider. With that being said, Rodriguez asserts that, ultimately, it is the competitiveness of the supplier that matters, with no prioritization being made as to which local currency the deal may entail. But it is indeed extremely crucial in the end, still, he says, in terms of bottom line management. As the currency is not per se adjusted in the contracts, other than which currency is chosen for the specific purchasing orders, the company, or rather the individual buyers in collaboration with the team manager and the director, inherently needs to keep track on potential triggers to, and current, fluctuations of the exchange rates.

"*So the issue at hand is not really the difficulty to change the currency [in the contracts], but rather to overlook the fluctuations. In every region, you have to keep a track of it and keep monitoring it on a monthly basis."*

Even though the company has a strict rule to not perform any currency adjustments, again, with the lack of a currency clause in regards to this in the contracts, there are scenarios with increases or reductions in the exchange rates resulting in supplier-company discussions on this topic. The example put forward, by Rodriguez, is that if the exchange rate movements take directions in disfavor of the supplier (see figure 4.2 below for a numeric example), it is very common that the supplier contacts the company stating that they need to be reimbursed for their financial losses in regards to this. However, when it is the other way around, the supplier does not get into contact with the company. In this latter case, what the company instead aims to do is to, as often as possible when the prevailing workload agrees, Rodriguez adds, keep an eye on the biggest suppliers (measured in spend) and try to negotiate for a share of that profit.

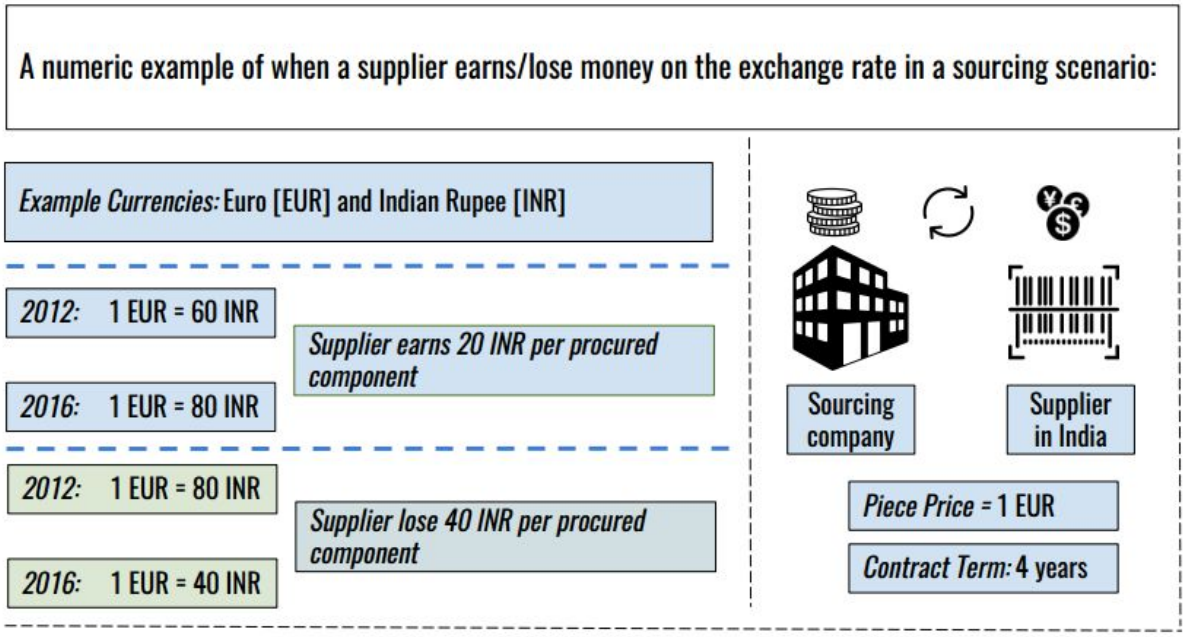


Figure 4.2, A Numeric Example of Supplier Earnings or Losses on Exchange rates, Based on Data Collection

Occasionally, the profit is shared, for example if the supplier makes 20 % then the ambition is to either divide it into 10 % equal parts or to get a cash payment directly for a settled number. Another alternative is to negotiate terms to a following percentage reduction on the future component price. He also acknowledges that an alternative is to go back to the 'profit-loss' issue at the end of the contract term to negotiate for piece price reductions, in cases where the contract is to be renewed. Overall, Rodriguez views ERM as crucial as well as intricate work, where one needs the right negotiation tools, usually achieved by regularly tracking the exchange rates, and also good timing, conclusively adding to the point:

"To keep a track of all exchange rates that are happening globally and events linked to these, that makes it much more complicated. You have to have knowledge and you have to have time."

In terms of ERR mitigation methods, Rodriguez mentions a few options from the top of his head, such as bank financing, various types of hedging or buying the goods directly in the local currencies from the local market. He further states that there are challenges connected to using methods such as these in terms of the size of the company and the number of components and transactions that are being carried out on a monthly basis emphasizing the complexity of the organization and its sourcing processes. It is possible however to put such risk mitigating measures into action and there is potential to gain from it, he expresses.

4.2.3 Working with Reducing the Obstacles of ERR

When Rodriguez is asked about his opinion on ERM and what capabilities an organization dealing with ERR needs to possess, he declares:

"*Exchange rate risk management is very complicated. I can never have a clarity on when we do what or even how we do it. Exchange rates are so unpredictable.*"

He explains that to even begin working with the issue, you need to acquire knowledge about the surrounding environment, such as the political one, or the oil prices or gold prices, affecting the movements of currency rates. It is then crucial to make a mission plan of which suppliers to keep an eye on, since you cannot keep track of everyone and their respective currency, and then try to focus on these ones. The risk here is that you lose *"the smaller ones"*, however it is a matter of time and tools of which you have a restricted amount of, but this means that if the exchange rate turns in favor of the company they would know. However if the movements are in disfavor to the supplier, the phone will ring. All in all, in case of supplier relationships with regards to ERR, being open to negotiations and possessing the right bargaining skills is a critical capability in terms of successfully maintaining a good management and level of one's ERR exposure.

Going forth in the interview, Rodriguez talks about how it has become more and more clear that achieving success in one's ERR assessments is about producing a good strategy on ERM procedures. However this is a challenge, keeping track of all business activities, supply chain crises, goals and so forth on top of the factors related to ERR is not easy.

In Rodriguez view, in addition to this, good communication between the buyers and different departments is crucial in bringing forward a helpful "*information base"*, and creating a good environment within one can deal with ERM in the best way possible with the available tools.

4.2.4 A Focus on Knowledge in ERM

Rodriguez describes that the more you work with ERR, or rather ERM, the more knowledge you realize that you need. The dilemma is however that most of the time, the procedures are characterized by a high level of complexity, implying that you easily lose track of what needs to be done or how to do it. For example, whenever a change in the political environment is taking place, such as the Trump administration coming into power in the U.S. or a new prime minister is elected in the U.K, or whichever it might be, the stock market and the exchange rates take certain directions which you were anticipating. In regards to this, one needs to acquire the right knowledge of the similar historical events, and the repercussions these changes have had, or will have, in the past and the future. There is also an important factor of knowing when implement a certain measure. To explain, Rodriguez mentions that you need to work proactively with, and be reactive as to, when to contact which supplier, when to more carefully monitor the fluctuations and when to use a specific method or a certain tool, in order to mitigate ERR. As further emphasized, since these are issues which are encountered on a regular basis, in different levels, by all internationally sourcing buyers, to communicate your aims and challenges with other people in the same position could be very helpful. This is however not always easy, due to the fact that, yet again, the faced risk exposure, and perception of it, individually differs in terms of responsibility area and on case to case basis depending on the sourcing scenarios. Apart from this, the work time is limited and you only have so many hours to work with your sourcing cases per day. In terms of using meetings as a platform for discussing issues and opportunities relevant to ERR, Rodriguez explains how they have monthly meetings in the team where this can be brought forward. Usually, they go over the fluctuations of the most used currencies during these meetings, however, he adds, *"it is not really a deep dive, it is just on an information basis"*, indicating that the information is voluntary to bring into question and then apply in one's own sourcing cases later on. Above all, he has a very positive approach towards these types of meetings, since it gives every chance to receive knowledge on certain aspects, which might aid both practically in your daily work.

Apart from this, it brings important value in terms of time savings, by sparing you otherwise time consuming information search endeavors. Rodriguez adds that along with the aforementioned positive elements comes the challenge of being able to lift out the important information and then act upon it, which in the end comes down to a matter of making a subjective judgement call.

"Everyone have to individually identify this, grab the info and act upon it! Some of them do it, some of them don't, depending on the crisis of the month and also based on the time available."

Adding to the discussion, Rodriguez mentions that these meetings, on a monthly basis, take place in large groups including the top management. These are very important meetings, where crucial information about the organization's health and whereabouts is being shared. Also "smaller" meetings are successfully conducted, but even smaller groups than that could be good to have, since it might be even more effective, he encouragingly adds. Conclusively, Rodriguez informs the authors that, as for now, a tool which is used to spread news "across the borders" of the company is a magazine. Albeit being a good magazine, it only contains of generic information and do not present any specific cases that could be good for other people in the organization to take part of, in order to share valuable experiences.

"It is a magazine in which we keep 'all the fun stuff' in, so it is only generic information which is motivating for the employees. However, it would be a good tool to use to cover exchange rates issues and opportunities, presenting cases, along with changes in raw materials and the sort."

4.3 Case B, Daniel Ancher, Sourcing Buyer

4.3.1 The Severity of ERR

When considering all of the risks encountered whilst conducting global sourcing, Ancher states that there are a lot of risks to be taken into account, however ERR is definitely one of the biggest ones.

He states that it all starts from being heavily dependent upon importing options, where you need to import goods from an exporting supplier located elsewhere in the world. Here, the currency issue will come into the picture. In Ancher's case, the lion's share of the suppliers supplying goods for the organization's production (or rather assembling) plants are located in Europe, indicating that most of the spend is in EUR, however USD is also one of the currencies dealt with in said sourcing efforts. When asked about the difficulties in forecasting and managing fluctuations in these currencies, Ancher announced that there is always a challenge in anticipating how the coming months, or next year, is going to turn out, creating an uncertainty, also adding:

"In my opinion, what is important of knowing is the historical events of how the currencies have behaved in the past."

Restrictively, he emphasizes that even when knowing this, predicting the future exposure to ERR is hard, and continues by saying:

"There is nothing like magic here, I would say. There is not any set formula, or any set guideline for us to use to get the figure on how to best handle the risk."

Ancher continues by stating that the critical thing to do in managing ERR is to collect various resources and information (from human resources), and then put these resources together. By doing this, internal analysis and judgement can be made in order to decide for what is right for the organization in terms of risk management. What is then emphasised is that one needs to possess the ability to analyze the supplier situation, the historical events of the exchange rates and then pull the company resources together in order to cope with these challenges.

4.3.2 Uncovering Dilemmas and Various Management of ERR

As the interview proceeds, we entered into the subject of contract design, namely that when contracts with the suppliers are put forward, no adjustment on the ERR is being considered. The aim of the contract is to maintain the price (piece price for each procured component) fixed, regardless if the exchange rate goes up or comes down, eliminating liability to correct component prices as the exchange rate fluctuates.

This means that sometimes the exchange rate is in favor of the supplier, and sometimes it is in favor for the case company, however this is not accounted for directly in the contracts. There are examples of when suppliers have not agreed with this, at certain points in time, where corrections in regards to exchange rates have been made. Subsequently, there are also situations where the sourcing buyer has identified the exchange rate leveled in the supplier's favour, and successively used this as leverage. Explanatory, this type of leverage comes from the supplier making money on the prevailing exchange rate, opening up for going back to the supplier asking for (piece) price reductions. This too is a critical aspect in ERM, where negotiation tools are implemented by the sourcing buyer. Other than using contract design to approach ERR, or going back to the suppliers to negotiate, when Ancher was asked about possible improvements of current ways of ERM within the company, or other means of ERM, hedging was brought forward.

"One option is various types of hedging. In previous organizations where I have worked, they have implemented hedging methods in order to mitigate ERR, but, as far as I know, within this company this tool has not been used so far."

Ancher did not have the knowledge of the specific reason as to why this type of tool has not been implemented, but added that the reason may be limitations and restrictions from the financial site of the company. It was stated that there was an inherent interest in knowing why however, and also that it would be good to get some insight on how different companies (especially within the same industry) are dealing with ERM, in order to find other potential efficient ERM methods.

He continued with introducing an example on why hedging instruments probably should be used within the company, in situations where heavy currency depreciation is prevailing in a market, in this case, Brazil.

Plants located in Brazil are importing components which are being shipped from other parts of the world, for example Europe. Concurrently, the Brazilian Real, BRL, is depreciating against the USD (and the EUR), implicating that for every 1 USD one now have to give up more BRL than before (See figure 4.3 below), resulting in losses.

"It [a hedging strategy] could be helpful here. But it is again a risk also, however it can be a calculative risk for the organization. In my opinion, hedging should help us, if it is done in a correct way."

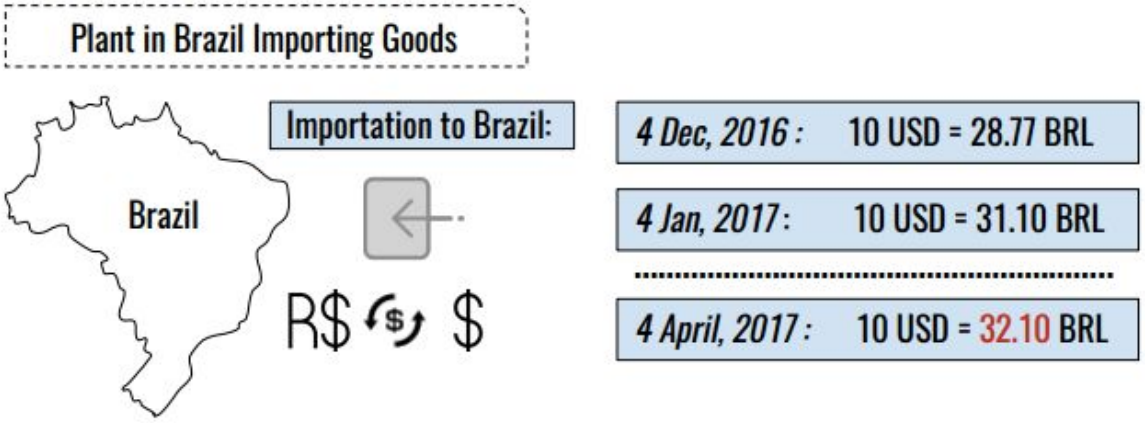
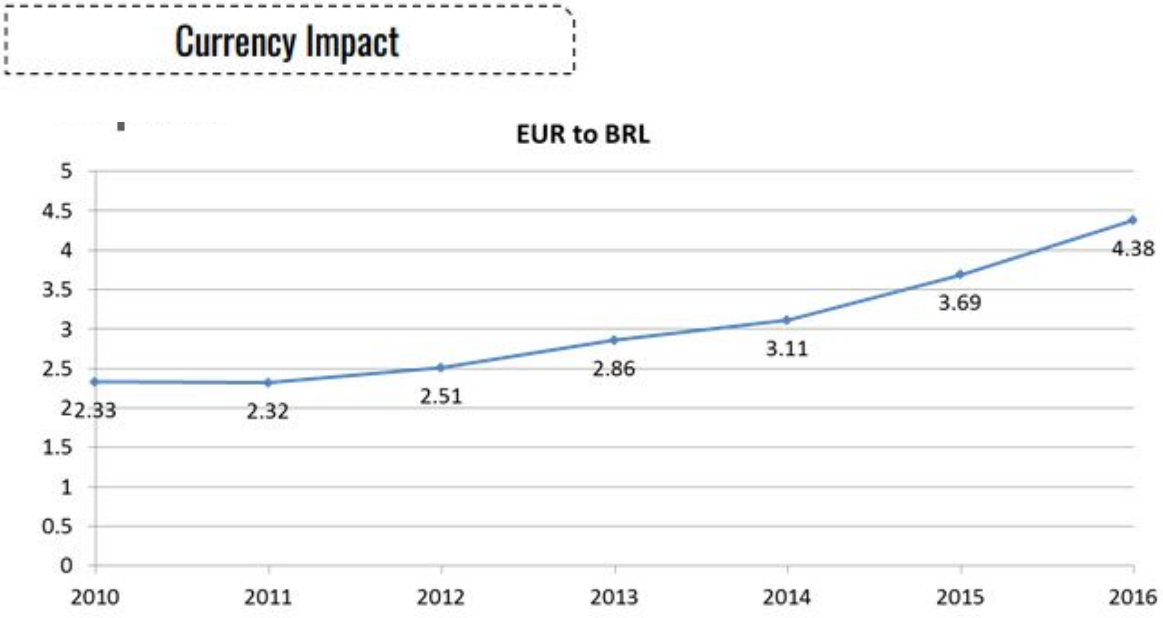


Figure 4.3, Plant in Brazil Importing Goods, Based on Data Collection

Conclusively, in order to clarify how the relationship between two active currencies, e.g. two currencies which are used in a prevailing sourcing case, in more detail have a strong impact in terms of % change of costs, both short term and long term, another example was put forth:



	2010	2011	2012	2013	2014	2015	2016
Average	2.33	2.32	2.51	2.86	3.11	3.69	4.38
Delta		-0.01	0.19	0.35	0.25	0.58	0.69
% change		0%	8%	14%	9%	19%	19%
Cumulative		0%	8%	22%	30%	49%	68%

Figure 4.4, Currency Impact, Chart Provided by the Sourcing Buyer, Case B, 2017-04-03

Figure 4.4 gives an idea on how "*the buying costs*" are affected by yearly changes in exchange rates in the currency relationship of EUR to BRL. If one excludes other factors affecting the cost base in a sourcing case and only focuses on the exchange rate reality, one will quickly identify that over 6 years time, the procurement costs will have increased by 68 %, if you are sourcing to the local plant in Brazil.

4.3.3 Working with Reducing the Obstacles of ERR

It is mentioned that ERM is difficult to succeed in since there is not any set formula or guideline to use in order to figure out the best way to handle ERR. However, there are a few capabilities which are important to develop and posses in order to get closer to an efficient ERM. Ancher sets forth that one of these is the knowledge and ability to perform ERM methods such as hedging. It is stated that hedging is a well-known measure in many organizations with international presence, however not all organizations go through the lengths of performing it, and this may be due to a lack of knowledge.

Moreover, he sets out that the capability of understanding the currencies is crucial, emphasising the importance of understanding the historical behaviour of the exchange rates in order to build a framework for how the behaviour might look in the future. However, this is challenging, and here collaboration seems extremely important. What is brought forward is that, even in purchasing it is not that one person can decide what is going to happen in the coming years for a particular currency, so most of the time, Ancher, and the sourcing team working in the same department take help from some other part of the organization.

"What you need to do is that you need to collect various resources, information from various resources, and then put these together to do internal judgements in order to decide for what is right for the organization"

To develop the capability of pooling resources, in order to receive input to decide for an internal strategy, and the next steps connected to it, is stated by Ancher as being truly important. Apart from this, another success factor linked to the ERM capability identified were negotiation skills in the supplier relations.

In order to realize benefits from identified supplier exchange rate benefits, the leverage must be used appropriately in negotiating for potential price reductions.

4.3.4 A Focus on Knowledge in ERM

Knowledge about all aspects concerning ERM seems important, with an emphasis on possessing knowledge of how currencies have behaved in the past, why they have behaved in that way and how they might behave in the future. Ancher explains that if one knows this, potential trends could be identified, aiding in mitigating ERR, especially through using risk reducing measures such as various hedging methods. He continues stating that, here, it is important to look at practical cases which the organization has had over time, and looking at how other people in purchasing are performing it, especially other companies in the same industry.

Using the knowledge residing in other teams or departments, the organization spreads the knowledge of the issue, and also creates a better chance of catching exchange rate behavior so appropriate internal tools might be put into action. Ancher states that the company might not always prioritize the area of ERM, but it is an important issue why it is good to spread knowledge about this in order for them to look into this activity even more.

4.4 Case C, Tammo Jefferson, Senior Sourcing Buyer

4.4.1 The Severity of ERR

Early in the interview, Jefferson initiates a discussion on how differences in the profiles of the purchasing portfolios are of great importance when assessing the exposure to ERR. In Jefferson's case, the profile of the purchasing portfolio as seen today, was not in a large extent affected by exchange rate exposure in the same way as another purchasing portfolio might have been. The reason for this is that the components he is responsible for procuring are strategically sourced within the same continent due to the heavyweight character of the goods. Nonetheless, Jefferson identifies ERR as a definite part of sourcing cases in general, where, depending on the sourcing method, it could have a huge impact on the organization as a whole:

"It is a huge part of a sourcing case, to have that good understanding of the risk, and what that currency can really do to you as far as your pricing that you are working on today."

Jefferson explains how currencies are part of the deal (in sourcing internationally), whenever you set a pricing with the supplier, in a different land or on a different continent, the currency comes into play.

"You may know what the exchange rate looks like today, but if that currency faces changes of let us say 10 % – 20 %, it is going to create a whole different scenario for you possibly."

With that being said, he shares his experiences in having watched the Euro swing heavily since its inception around the year of 2000, and is amazed of how heavily it has fluctuated over the years, in connection to developments in the global economy. Jefferson denounces that even though it (ERR) is a definite part of sourcing today, he would have never thought about those matters less than 15 years ago, emphasizing the growing importance of ERR today. Continuing, it is further stated that even though ERR inherently is a part of the sourcing process today, it is not the biggest risk in global sourcing in his opinion. The grounds of this are presented in the fact that quality risks evolves more and more as the supply chains are getting longer, indicating larger risks for disruptions and delays. Jefferson states that:

"Truly, when you have a supplier from India, or from China, with the longer supply chain, the more your quality risk evolves to me. Since it takes so much longer and more expenses to replace any parts which are defective, creating longer disruptions and delays."

4.4.2 Uncovering Dilemmas and Various Management of ERR

A solution to minimize risks such as these is to source locally as much as possible, and, or to request the suppliers with a long supply chain to take care of the logistics by bringing their goods into warehouses to the sourcing host's continent. When speaking in terms of sourcing strategies in the effort of mitigating risks, Jefferson also mentioned dual sourcing as an option specifically related to ERR:

"There is a way of mitigating the risk, it would be to possibly have dual sourcing in that part, where you would be able to swing your percentage of business from one country to the other. If you had those types of components where you could transport them easily and cost efficiently, in a competitive manner, that is one way to mitigate it."

When asked if this is possible, in terms of the contract design, the answer was yes, that is possible, however it is not an activity he is involved with presently. For example, the situation today in Brazil (with the depreciating currency, BRL) brings opportunities for buyers today to source components from local suppliers there, rather than from Europe, in order to take advantage of the current currency situation. Also, as the company has a large geographical spread in for example Europe, the Euro base in the company, produced by sales in EUR, is large. Consequently, sourcing scenarios entailing the company's payments are required to be in Euro is in many situations not subject to ERR exposure, where the denominated payment currency in the contracts then is EUR.

4.4.3 Working with Reducing the Obstacles of ERR

In terms of key success factors in ERM, Jefferson states many important aspects as to what capabilities are crucial in order to heighten the chances of being globally successful. The first denominator is the actual speed, of going from discovering the risk to taking action. In order to achieve this, one needs to possess the right knowledge about the fact that the risk is there, and how to measure it. This goes hand in hand with knowing what is driving the exchange rate fluctuations and to closely monitor the swings, and then be quick on your feet, he continues with stating:

"It has to be one of the major issues for international companies today, for them to know where to take advantage of it (the exchange rate). The fact that we are dealing in different currencies, and we have to have the ability to deal and understand where to take advantage of that currency."

This is what is great with this company, Jefferson proclaims, normally, when one continent is down, there is another continent where the sales are up which can compensate for the downturns in the previous one.
The same goes for currency rate exposure, like in the Brazil vs Europe sourcing case above. In terms of this, the key factor is flexibility, which can be about not being limited to only one market, but to be able to move. Jefferson continues with stating:

"Truly, in today's world, you have more opportunity to compensate downturns in one continent with another. Also, you have to stay flexible in your work time, you cannot just work 8 to 5, where you are at. To be able to be really successful globally, you have to be flexible, to be able to work in the early morning hours, or the late evening hours in order to compensate for that (time differences). In Europe, it is the best to be, that way you are more in the middle. Here you have better chance of doing this, in order not to interfere with your colleagues work days."

Subsequently, not only being flexible in the ability to swing from one supplier to another, you also need to work as a family, always staying positive together, with collaborative capabilities. Jefferson puts forth the size of the company as a factor here, or rather the geographical spread, in coping with these risks. If you are limited to one market only, *"you will be on a roller coaster, experiencing up and down type of business, and you will be pretty much tied that way"*. Instead, what is important to emphasize, is that the case company is rather diversified in its product portfolio and geographical spread, producing the ability to merge (sourcing teams and different departments) in terms of supplier relations, coming in with a stronger bargaining power in sourcing projects. Jefferson also puts forward the importance of understanding cultural differences, that comes with working in a culturally diversified team along with the greatness of it, since it brings opportunities of solving issues together in a multifaceted way.

4.4.4 A Focus on Knowledge in ERM

Jefferson again describes that in order to go from risk identification to action, knowledge about the fact that the risk is present is crucial. When putting together a sourcing case, it is

important to have knowledge on the potential range of the currency swings which can occur in the term of a contract with the supplier. He states:

"To know that range, which you can see throughout the history of that currency, is important. In numerous sourcing cases I have worked with, we have together done an average of say a 3-year span, then we have a good understanding of what that range could be. Or (what range could) incur in the term of a contract. So, while you are doing a sourcing case, you could have a good handle of what the risk is, in regards of the currency is going up or possibly down."

More examples are brought forward, where cooperation in knowledge transfers is important, why Jefferson has monthly staff meetings with the team.

"Talking about knowledge transfer, the top manager goes through great effort, as a part of our staff meeting each month. The top manager lays out all the different currencies, and tracks them. And then, this is presented to us, in order for us to get that knowledge of currencies and the swings, and where there is an opportunity (on a swing of a currency) to maybe go back to that supplier, knowing that you negotiated that deal at one level and now you have reached a different level (of currency rates)."

In this case, the top manager goes through great lengths getting this type of knowledge right from the director, he explains. This means that that type of knowledge, on currencies, the top manager provides in order to aid the team in their sourcing efforts, in order to drive more savings for the buyers and, overall, the organization.

4.5 Case D, Sara Walker, Senior Sourcing Buyer

4.5.1 The Severity of ERR

When asked if exchange rate risk is one of the biggest risks in Global Sourcing, in comparison to other risks such as quality risks, disruptions and delays and so forth, Walker, without any delay, strongly answered, *"Yes!"*. The profile of Walker's purchasing portfolio is multifaceted in currencies, including JPY, EUR, SEK and USD, where EUR is taking up most

of it, however so far this year, she has not faced any losses in currency exposure, only benefits. Depending on where the supplier is located, naturally, the purchasing currency differs, but Walker prefers to use the local currencies for each region.
The sourcing activities she performs is continental in that sense, indicating that when goods are needed for the European plants, the prefered result is to use a European supplier and so on.

"Mainly: we prefer to use the local currency for each region"

Walker informs that it is the individual plant which places the order that is paying, so for example, if a plant in Brazil orders components from a European supplier, then this plant is facing exchange rate exposure (or exchange rate opportunities if the rate is in favour of the sourcing party) in its efforts to convert BRL to EUR. Going further into the difficulties of forecasting and managing exchange rate fluctuations, Walker emphasizes the political effects as drivers of these and adds that there is clear challenge in forecasting which directions the exchange rates movements will take.

"Because sometimes, you see that if there is no direct political impact, then it (the exchange rates) would maintain the same for a long time. But suddenly, the situation can become more intense between countries, for example between the US and Russia, and then the economy turns bad."

4.5.2 Uncovering Dilemmas and Various Management of ERR

Walker explains that, even though, anticipating and managing the fluctuations are inherent challenges in sourcing today, they are crucial to deal with. She continues by describing an important method in dealing with ERR, namely to take the path of negotiating with the suppliers:

"One example I think of (in dealing with ERR) is that, yes, currency brings you risks, but it also brings you an opportunity. So maybe you can choose to negotiate with the supplier, you always choose to use the currency which is beneficial for you."

Walker brings forward an example in buying from Asia, more specifically a Chinese supplier. If the Chinese supplier quotes in Renminbi (RMB), then, during the first procurement, the buyer can choose to pay in Euro. However as time goes by, the exchange rate fluctuates, and at the point of the second purchase, USD would be more beneficial to use (See figure 4.5 below):

Figure 4.5, A Simplified Sourcing Case with the Supplier Based in China, Example Provided by the Senior Sourcing Buyer, Case D, 2017-03-23

Linking to the example above, she states that:

"If you continue to pay in Euro, you will pay more. But at this time, you go back to the supplier, to re-negotiate in terms of payment currency and say that you want to pay in USD. This is a good method to use in order to get the benefit"

This depends on case by case, here it is important to stay flexible and negotiate with the supplier. This is not included in the contracts, but if she has a strong case, or see a strong

trend in the exchange rate situation, this is a good method to use in order to mitigate ERR and reduce potential losses. With this example in mind, Walker states:

"A good strategy to avoid currency fluctuations it to buy locally, since it mitigates a lot of risks."

Walker, and the company, however sets out for the most competitive suppliers, regardless of their location, so usually you can not choose where to supply from, but have to pick the most competitive one in terms of quality and price, not focusing on the currency of that supplier. You can however always negotiate which currency to quote in, together with the supplier.

4.5.3 Working with Reducing the Obstacles of ERR

When asked about what key capabilities there are in terms of coping with ERR, and identifying exchange rate opportunities, Walker started by exclaiming that knowing the currency trend is the most important thing. A key success factor in ERM, she continued with saying, is to at least keep an eye on the index of USD and the Euro, and be fast in seeing changes which could have an important effect on the sourcing efforts. Walker emphasized that knowledge of why these changes occur is extremely important, also stating that:

"You have to be a little bit smart about what time is the right point to switch to another currency to bring you benefit."

Further, she explained how you, as a sourcing buyer, need to have a high acceptance level in realizing when you have to go into a situation and start negotiating with the suppliers. You have to be flexible enough to change, which is not always easy. Walker states:

"You need to be open to negotiations, you can always go in and do it. But it is hard. The important thing is to coach each other, you need to look at it case by case, which is good."

Negotiation skills is therefore noted as an important factor, where you can always go back to the supplier and ask for a price reduction, or even a 50/50 split on the exchange rate profits they have made in relation to your sourcing case. It is not always easy, she states again, they

can be resistant to put in the time and effort, or to change in the contracts. However you usually come in with strong evidence, based on the currency rates.

4.5.4 A Focus on Knowledge in ERM

Walker explains that in order to know the trend and act fast, the knowledge about the basis of exchange rates and the drivers behind the fluctuations needs to be there. This is also crucial in terms of bargaining power, in order to even be able to get back to the suppliers, since in order to have strong evidence, you need to know what you are dealing with. To coach each other is marked as important as well, and this is done through biweekly small team meetings and big team meetings on a monthly basis. In this forum, she explains, there is room for improvements, best practices can be brought forward, and during the big meetings Walker has learned about good ways to deal with ERR and negotiate with the suppliers. In regards to this, she states that:

"The director introduced a case about going back to the supplier to negotiate, in one of the bigger meetings. This is how I learned of that specific practice. Because the currency is fluctuating, the situation is fragile and it is not easy to negotiate with the supplier, it is good to coach each other."

4.6 Case E, Peter Murthy, Sourcing Buyer

4.6.1 The Severity of ERR

Approaching the question whether ERR is one of the biggest risks in global sourcing, Murthy answers:

"In my opinion, it is not the main risk; however, it is part of the challenges that we face in purchasing. Not the biggest one, but one of the bigger ones and this risk may go up and it may go down, depending on which region you are sourcing from."

He proclaims that in terms of regulating ERR, the organization does not have an exchange rate clause in the contract itself, so the risk is often completely on the supplier. On the other

hand, the movements of exchange rates are often used as leverage, when the trend allows it.

In some cases, the company can use financial centres who then normally pays the local suppliers in the local currency, resulting in the exposure being close to none. This is the most ideal case; Murthy tells the authors however, it is not viable to put up such facilities all over the world since this would affect the bottom line heavily in terms of personnel and other costs. From a supplier perspective, this would also be the optimal set-up, since they prefer being paid in the local currency, as it takes away the uncertainty of the exchange rate. He continues by stating:

"The best thing is to pay in the local currency, but again it would impact the bottom line. It is unclear how feasible that solution could be. As a scenario, we would like to pay the supplier in their own currency, so we remove the currency clause completely. But, for a company to implement this practically will be a challenge."

Murthy talks about his previous experiences in dealing with ERM, bringing forward the difficulties faced in predicting exchange rate movements altogether. The best way to do it according to him is to create a trend, on how it has fluctuated previous years and then make an effort in trying to make predictions for the future.

"But we can't predict for sure on how it would fluctuate in future, due to a lot of factors which are beyond our control. What might be favourable to us today may or may not be favourable to us tomorrow."

4.6.2 Uncovering Dilemmas and Various Management of ERR

In Murthy's opinion, realistically, by tracking the past, one can therefore try to predict if it will go up or down, but if it goes the other way, then the buyer will not have any control over that. It all comes down to bottom line management, where ERR calls for a correct ERM, in order to maintain the control. Moving forward, he explains that a critical part of ERM is to keep an eye on if there is any room to go back to negotiate with the suppliers in terms of piece price reductions due to the exchange rate movements. This happens not only when the

contract period is over and terms are naturally being re-discussed, but also through the duration of the contract as well.
In the former example, Murthy may go back to the supplier for contract negotiations and there present the calculated percentage of what the suppliers has earned on the exchange rate the two parties are trading in (on a weighted X year average), demanding a price reduction based on this (if the trend is in the company's favour).

"The suppliers usually are keeping track on the exchange rates, so he can predict when we are going to come."

Understandably, exchange rate movements happen all of the time and the company may have big opportunities to receive price reductions more often based in this, however when asked why he is not performing this more often, instead of only at the time of the contract negotiations, Murthy states:

"We don't go into number and detail on the exact amount the supplier has gained, because that would be too tedious of a job to do considering the pay-off and the number of suppliers involved. If we keep doing this for every supplier or component, we will need to have a dedicated team and it will divert focus from the core business."

Approaching the subject of various types of hedging, in the ERM capability, he proclaims that *"It is a big topic in itself which requires detailed analysis and expertise in order to be beneficial to the company. Currently, we do not do this in our company"*.

4.6.3 Working with Reducing the Obstacles of ERR

Murthy explains how one of the key factors to success is location and flexibility, in terms of deciding with purchasing strategy to use, for example single sourcing or dual sourcing. One needs to look at the payoffs, mostly in terms of the value to weight ratio and other factors which may come into play here, as explained. He also places importance on working closely with other teams, investigating the suppliers and producing forecasts and the sort. Knowledge on how the exchange rates have looked for a certain time period is always important, says Murthy, in order to predict how they may go in the future, he continues:

"And if it is not predictable how a specific currency will turn out in the coming two, or three, years down the line, then at least for this year". Knowledge on this brings control, especially if you have knowledge on the triggers to these fluctuations, Murthy explains.

"The triggers might be of different reasons, so we need to understand: if it is a short-term or long-term (exposure), affecting our current situation or if it will have repercussions in the future as well."

Time is also of the essence, since the ability to work with ERM, such as monitoring each supplier and going back to negotiate, demands a lot of work. In the same light as this, bargaining skills are also brought forward:

"Even though it is not in the agreement, we still go and challenge the supplier. This does not need to be happening at the time where the contract is to be re-negotiated, but if we see a supplier making money and that this will sustain, depending on the situation, we go back and challenge him."

4.6.4 A Focus on Knowledge in ERM

During the interview, Murthy emphasizes on the importance of possessing the right knowledge when dealing with ERR. Good communication between different teams and departments with knowledge about ERR aids in predicting both the movements of the exchange rates, and dealing with these types of issues. He mentions that there are a lot of factors which are uncontrollable in regards to the fluctuations, but collaboration is good to have in times where these types of issues arise. Some of the other colleagues might have encountered a similar problem in the past, and can share their knowledge, for example during the monthly group meetings. In relation to this, good communication is a critical capability to have, stating:

"If we encounter a problem, we communicate this issue with other people on the team. Since we are spread all over the world, it is good to get input from our colleagues, and we also work closely with other purchasing departments in trying to overcome the challenge and do what is most beneficial to the company in the long run."

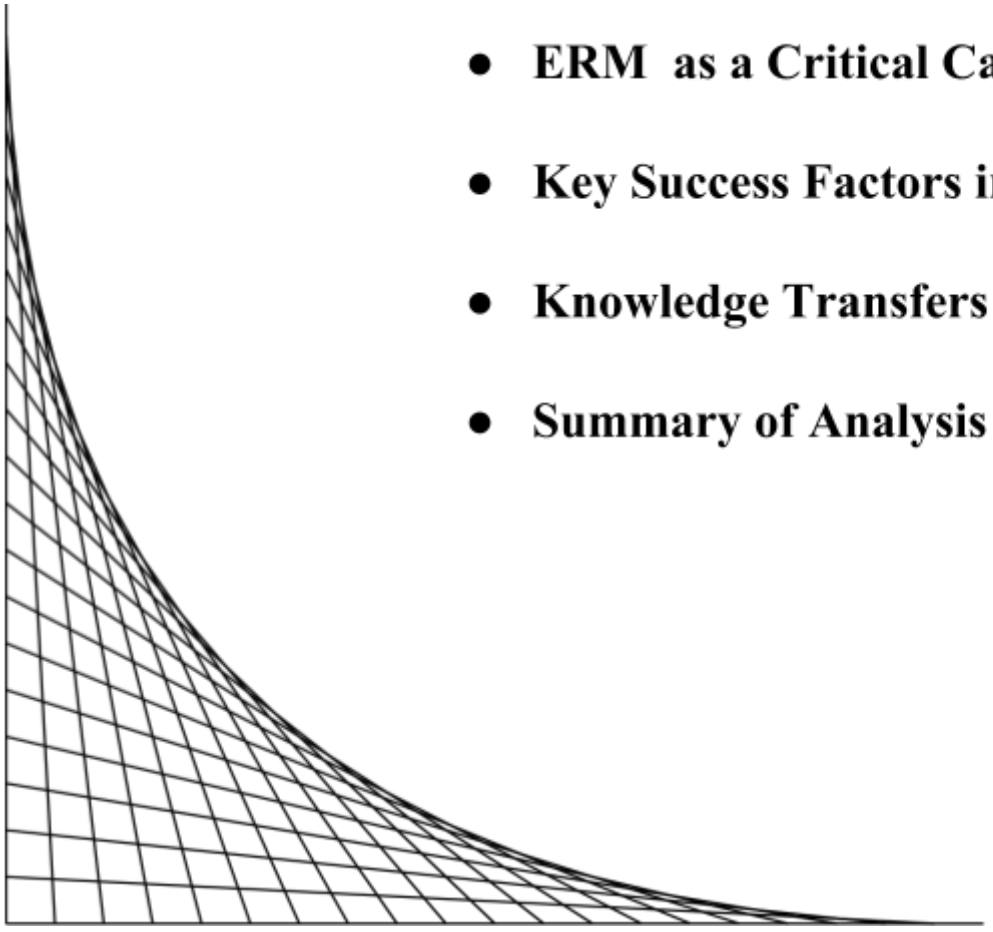
4.7 Summary of Empirical Findings

	Exchange Rate Risk	Uncovering Dilemmas and Various Management of Fluctuations	Working with Reducing the Obstacles of ERR	A Focus on Knowledge in ERM
Case A	❑ An extremely big risk ❑ Risk exposure always perceived and faced differently ❑ Difficult to track every currency	❑ Large number of currencies dealt with in various sourcing cases ❑ Challenging to anticipate the fluctuations ❑ Important to attain a clear picture of the ERR situation [Tracking] ❑ Time demanding ❑ Changes in the supplier base affects the currency portfolio ❑ The total exposure can never fully be mitigated ❑ No currency adjustments in the contracts ❑ Supplier negotiations, good timing crucial ❑ Bank financing, various types of hedging, local sourcing	❑ Right negotiation tools ❑ Ability to track exchange rates ❑ Good timing, for ex. when to take advantage of the exchange rates ❑ Realizing the size of the company ❑ Knowledge about the environment and drivers of fluctuations ❑ Time to perform ERM ❑ Negotiation skills ❑ A good strategy on ERM ❑ Good communication ❑ Creating an information base and a good climate	❑ The more you work with ERM, the more knowledge you realize that you need ❑ You need to know what has to be done, since you easily lose track of what needs to be done or how to do it ❑ Need for knowledge on the surroundings and the history of the relevant exchange rates ❑ Monthly meetings to share the knowledge ❑ A magazine discussing ERM could be good
Case B	❑ One of the biggest risks in global sourcing ❑ An implication of being dependent on importing options ❑ No set formula for how to best handle ERR	❑ No currency adjustments in the contracts ❑ Currencies are either in favour of the supplier or the buyer ❑ Negotiations, important to collect exchange rate leverage towards the suppliers ❑ Hedging could be used	❑ Knowledge - About the currencies - Historical behavior of the relevant currencies ❑ Pooling resources and information ❑ Ability to analyze the supplier situation ❑ Negotiation skills ❑ Ability to perform risk reducing measures, ex. hedging ❑ Collaboration	❑ Knowledge in all aspects of ERM is crucial ❑ Knowledge on the historical behavior of the exchange rates is extremely important ❑ Knowledge residing in other departments and people is essential to get a hold of ❑ Knowledge about ERM is important to spread, in order to prioritize the ERR topic more

Case C	❑ Always a definite part of global sourcing ❑ The differences in sourcing portfolios determine the exposure	❑ Important to minimize the ERR, since the consequences otherwise could be large ❑ No currency adjustments in the contracts ❑ Local sourcing, dual vs single sourcing ❑ Take advantage of the EUR and USD currency base, in the firm, generated by sales activities	❑ Speed: from risk identification to action ❑ Knowledge - That the risk exists - How to measure it - The drivers of fluctuations - When to take advantage ❑ Close monitoring of the exchange rate swings ❑ Realizing the size of the firm and the ability to stay flexible ❑ Collaboration ❑ Understanding people and different cultures, in order to perform ERM better	❑ Knowledge about the actual risk is basic in order to gain speed in one's risk reducing measures ❑ Knowledge on the potential range of currency swings during the contract term is crucial ❑ Cooperation in knowledge transfers, across all levels ❑ Knowledge drives savings
Case D	❑ One of the biggest risks in global sourcing ❑ Works with heavily currency-diversified sourcing portfolios	❑ Challenging to anticipate the fluctuations ❑ Negotiations with the suppliers ❑ Stay flexible ❑ Take it case by case ❑ Changing currencies between purchasing orders ❑ Use local sourcing methods	❑ Keep a close eye on the exchange rates ❑ Speed in identifying the exchange rate swings ❑ Knowledge - Ability to see a trend ❑ Knowing when to take advantage ❑ Negotiation skills and openness ❑ Case by case approach	❑ One needs to know the basics of currencies, why they fluctuate and how they have behaved in the past ❑ Coaching each other is important ❑ Experiences and best practices can be found by accumulating knowledge residing in different individuals and business units
Case E	❑ Not the main risk in global sourcing ❑ A large risk however, which vary with the exchange rates going up and down ❑ Might impact the company's bottom-line heavily	❑ Track the past to predict the future ❑ Challenging to know all of the factors behind the fluctuations ❑ No currency adjustments in the contracts ❑ Negotiate with the suppliers ❑ Single vs dual - and local sourcing ❑ Hedging is a big topic in itself, and could bring risks if not assessed properly	❑ Knowledge - Ability to see a trend - About the historical behavior of relevant currencies ❑ Location awareness and flexibility ❑ Negotiations ❑ Time to perform ERM	❑ Communication to spread knowledge is essential ❑ Collaboration can bring knowledge ❑ Knowledge is needed in order to attain control ❑ Better problem-solving through knowledge sharing

Table 4.2, Summary of Empirical Findings, Based on the Collected Data

5. Analysis



- ERM as a Critical Capability
- Key Success Factors in ERM
- Knowledge Transfers in ERM
- Summary of Analysis

This chapter is built on the theoretical framework and the empirical data collection from the case corporation. The aim of the analysis is to present the results from comparing relevant theories and reality, thereby answering the research question and achieving the main purpose of the thesis. The chapter is structured into three sections; ERM as a critical capability, key success factors in ERM and knowledge transfer in ERM.

5.1 ERM as a Critical Capability

5.1.1 ERR in Global Sourcing

According to the gathered data, the case company seeks technology, cost reductions and high quality components from the optimal suppliers located all over the world. The benefits from global sourcing activities for MNCs are unchallengeable (Jiang & Tian, 2009;Sinha & Sanchari, 2008), however, as theory states (Ho et al., 2015;Zeng et al., 2005;Samvedi et al., 2013;Tang, 2006), MNCs have to cope with various risks when entering into sourcing activities in foreign markets. In effect to this, three out of five interviewees confirmed ERR as being one of the biggest risks, among other different kinds of challenges they take into account when taking part of various sourcing activities. ERR include three types: translation exposure, transaction exposure and economic exposure (Eun & Resnick, 2007). Rodriguez pointed out during one of the introductory interviews that the case company faces transacting exposure regarding the supplier contracts in the buyers global sourcing actives. Linked to the life span of a transaction exposure described by Eiteman et al. (2007), the case firm is exposed on all three stages - quotation, backlog and billing, among which billing exposure is the most serious. The reason is that the sourcing contracts are usually long-term (3-5 years), however currency fluctuations come with high levels of uncertainty, which makes the outcomes in the contracted periods very difficult to predict. Nonetheless, Jefferson and Murthy do not consider ERR as a main risk in their purchasing portfolios, which in Jefferson's case mainly depended on him sourcing only from one continent, using US dollar as his main procurement currency.

Likewise, Murthy emphasized that ERR heavily depends on the sourcing region, adding that the risk is highly uncertain, it can easily go up or go down when changing regions. Thus it can be seen that ERR is considered as an inevitable threat to achieving full control in one's global sourcing activities.

5.1.2 The Selection of Suppliers

In terms of supplier selection, Rodriguez pointed out that they put priority on quality and the price of the sourced components. To emphasize, the main goal of the sourcing buyers is to buy high quality components at a reasonable price. Delivery, financial status of suppliers, production capacity and previous performances are also taken into consideration, which are in line with 23 supplier selection criteria provided by Dickson (1966). Although Rodriguez mentioned they do not prioritize suppliers based on the sourcing currency, four out of five interviewees, Rodriguez, Jefferson, Walker and Murthy, emphasized that they prefer local sourcing, other conditions being equal, in order to mitigate some of the company's currency exposure. With this in mind, the concern about currency is de facto not on the list of supplier selection criteria offered by academic studies (Dickson, 1966;Ellram, 1990;Garfamy, 2011). As a matter of fact, this might be somewhat contradicting to the critical impact ERR might have, being that exchange rates seems to be one of the most crucial determinants to a firm's bottom-line, particularly when high purchasing volume is involved, as described by both earlier research (Clark & Marois, 1996;Stanczyk et al., 2017) and the data collection.

5.1.3 ERR Reducing Measures

Using external and internal financial instruments is considered as the best way to mitigate ERR according to academic researchers (OECD, 1999;Butler, 2004;Eiteman et al., 2007). Although both Rodriguez and Ancher have showed their interest on hedging strategies, the case company currently does not use financial derivatives. The reason given by Rodriguez is that it will increase the complexity of the sourcing process, which is already of a highly complicated character in the large-scale MNC. A huge number of transactions are carried out every month. Therefore buyers are not able to conduct hedging for every transaction together with the purchasing activities. Ancher added another reason, namely, that they lack relevant knowledge and human resource to actually implement hedging strategies.

According to the data, the case company currently applied three methods to mitigate ERR. The first and most common way is to negotiate with the suppliers in order to split the benefits, or to get a percentage reduction on future components. Due to fact that there is no currency clause in the purchasing contracts, negotiation with suppliers are often needed, which are difficult and time-consuming. The buyers not only need have high negotiation skills but also have to consistently monitor the exchange rate changes during the contract terms. Additionally, in the end of the contract-term, the exchange rate movements which have been proven as beneficial to the supplier might be shown as evidence, as collected by the sourcing buyer or any other helping instance during the period of the year(s). This will then possibly provide adequate room for negotiations on piece price reductions, if the supplier is keen on extending the contract. The second method is similar to the first one, where the case company will propose a change in the payment currency if the current payment currency is experiencing a great depreciation. The downside of these strategies is that the suppliers may not agree with the changes, because of the need of re-signing the contract, which makes the ERM process even more complicated. Argyres and Mayer (2007) stated that contract design serves as a capability for MNCs to manage these types of risks. Without good contract design, risks have been out of managers' control (ibid). It is important to point out that the sourcing buyers in the case company lack of the contract design capability, which implies that they are putting themselves in a relatively passive position when negotiating with suppliers. The last method to mitigate ERR mentioned by Rodriguez, Jefferson, Walker and Murthy is to source locally in order to avoid the currency conversion. But it might not be easy to find a suitable local supplier which meets priority criteria, such as quality, delivery, capacity, etc. Therefore the usage of the financial instruments is limited. In general, the current methods to manage ERR used by the case company might, on one hand, make the supplier connections tighter and better, with regular interactions. However, on the other hand, they are time consuming and only generates a type of passive control to the case company.

5.1.4 The Need for ERM in MNCs

Ancher described a huge loss experience from a sourcing activity, due to the BRL significant depreciation. The cost of components went up by 68% in only 6 years from 2011 to 2016. This implies that the case company has to stop sourcing to the Brazil Plant, perchance by

sourcing locally if possible, in order to mitigate this ERR. Linked to the theory of Holweg et al. (2011), volatile currency rates have great influence on an MNC's financial status and performance. Nevertheless, looking at the data, there is inherently another side to it as well. Walker shed a light on this by stating that she has not experienced any losses, but only benefits regarding to currency fluctuations, in her purchasing portfolio, as of this year's numbers. Ultimately, at a holistic level, ERR, for MNCs, is a double-edged sword, representing both challenges and opportunities (Clark & Marois, 1996). Therefore ERM is considered as a critical capability for MNCs to prevent cost loss or to even benefit from currency movements. The different interviewed sourcing buyers have their own interpretation of what ERM is. Rodriguez for instance stated that the procedures process is full of complexity, there are a considerable number of factors that need to be considered so as to mitigate ERR. By creating an overview of all the interviewees, there is no clear and integral ERM knowledge on how to aggregately work with mitigating ERR, just fragmentary opinions. Combining all viewpoints of the five interviewees, ERM is needed to be able to include the ability to predict currency movements based on important political or economical events, the ability to continuously monitor currency trade, the ability to conduct in activities concerning financial derivatives, and the ability to negotiate with suppliers. However, in academic researches, external and internal financial instruments are foremost presented as ERM tools in order to directly deal with ERR (Klein, 2001;Butler, 2004;Eiteman et al., 2007).

5.2 Key Success Factors in ERM

5.2.1 Knowledge

The collected data reveals numerous elements crucial for an MNC to attain and maintain, in order to establish and develop its ERM capability. According to all of the interviewees, reviews need to be performed on how the relevant currencies are behaving at specific times, which demands knowledge on the currencies traded with and how to identify, as well as measure, the risk (ERR) this entails. This implies, in line with Walker, the challenge of identifying and measuring the exposure on case to case basis (Bennet, 2003).

By and large, if ERM is poor in this matter, this may subsequently lead to substantial losses for the company, which then should impel organizations to structure and restore effective management routines in their procurement functions (Suranovic, 2005;Muller & Verschoor, 2006). Explicitly, if the sourcing buyer lacks knowledge in these aspects, the exposure might not have been reduced in a way that was originally possible, leading to financial repercussions for the MNC. However, evaluating the situation for all sourcing cases one is responsible for takes time and it might be the case that sourcing buyers sometimes lack time, critical tools and knowledge on the topic.

Furthermore, Ancher, Walker and Murthy all stated that one needs to possess the right knowledge to be able to create a trend of the fluctuations, achieved by looking at the historical behavior of the exchange rate. All of them emphasized however that even when you have attained information of the past, you can only try to predict the future, indicating that there is no guarantee you will be closer to the truth. Linking to this, Rodriguez, on the other hand, rather focused on the importance of acquiring knowledge about the environment, in an attempt to predict what will drive the movements of the exchange rates and being able to create a mission plan. In accordance with Dumas (1978) theories on the exposure of the firm, uncertainty will always remain in this aspect, since it is indeed contingent upon multiple factors such as future currency rate movements, the firm's actual behavior and macroeconomic effects.

So the hidden costs stemming from ERR (Holweg et al., 2011), materialized through inescapable alterations in the global environment surrounding the MNC, carry uneasiness through the *environmental uncertainties and risks* presented by Jüttner et al (2003). Linking this to Rodriguez standpoint, and the theories of Teece (2014), looking at the past may prove viable in the cases where the information brings value through demanding well-developed capabilities, such as information collection, arguably in the form of dynamic capabilities in terms of problem solving skills. Decisively, using a more proactive stance, by acquiring knowledge of the actual interaction between an MNC’s external environment and its global supply chain might be a more feasible way to predict the currency movements and achieving control.

Frequently, the interviewees pinpointed different types of knowledge as important key success factors in ERM, such as knowledge on the different currencies, the historical behavior of said currencies and the triggers of the fluctuations. In the meantime, Jefferson first and foremost took another focus approach, namely on the importance of identifying the risk as to how much damage it might cause. He also highlighted the linkage between knowledge and speed as a key success factor, adding to the empirical discourse the dimension of firstly knowing your ERR and surroundings and then secondly to taking action, depending on the potential consequences. As described in theory, reactiveness from managers and knowledge on methods to cope with the issue may be delimited as a specific skill-set (i.e. a firm capability) in accordance with Teece (2014). The issue Jefferson then described demands unique processes and dynamic problem solving capabilities (ibid), in terms of being quick on its feet when it comes to risk identification and management within the organizational network, focuses on the MNC now developing dynamic capabilities in order to reduce the risk exposure of the MNC in total. Consequently, this highlights a strong need for operational competence, in line with the knowledge aspect presented by the interviewees, and strategies dealing with an issue, such as this, throughout the organization (Trent & Monczka, 2005;Gupta, 2006;Senft, 2014). This implies that the need for developing problem-solving capabilities, maintaining a dynamic approach, is large when facing ERR, since each sourcing case is different from the other. For this reason, being static in one's ERM approach would perchance prove fatal or less effective, due to missed opportunities to catch the risk, or opportunities, of the fluctuations. Hence, developing proper processes for applying and acquiring the knowledge which is needed for the sourcing buyers is one important part of the ERM capability at large.

Another aspect which was brought forward in terms of knowledge in ERM, by the majority of the interviewees, was the intelligence on when to take action. For instance, Walker announced that you have to be smart in knowing when you need to change the currency in order to bring you benefit, a statement which was mentioned by Jefferson as well. Accordingly, Rodriguez, Ancher and Walker expressed thoughts on good timing in terms of matching the tracking of the relevant exchange rates with going back to the supplier with leverage, for negotiations.

This links well to the theories of Lee (2004), who centralizes the need for managerial responsiveness and flexibility (agility), along with the need for keeping a close eye on the surrounding (adaptability), in order to respond with recovery plans in a time efficient demeanor (Lee, 2004;Sodhi & Tang, 2012). Again emphasizing the time perspective (He & Dumas, 1978;Adler & Dumas, 1984;He & Ng 1998), the sensitivity and exposure to ERR will always alter and these two are therefore inseparable and need to be managed accordingly. This, again, demonstrates the dynamics of ERM, where a combination of knowledge of the exposure, the sensitivity to the exposure and required managerial responses needs to be well balanced. In this sense, knowledge is realized as being one highly critical aspect of ERM, however the knowledge implied here is clearly multifaceted in its dimensions, as shown below:

- Knowledge about the actual exposure [identification] and the consequences if it is unregarded for [measurement]
- Knowledge about the different currencies dealt with
- Knowledge on the historical behavior of the currencies [trend creation]
- Knowledge on the triggers of the exchange rate fluctuations
- Knowledge on how to reduce the ERR using risk reducing measures
- Knowledge on when to take advantage of/action to the exchange rate movements

5.2.2 Information

Taking a small step sideways from the knowledge perspective, Rodriguez brought forward another component which he deemed as critical to the ERM capability as such, namely, information. He underlined that the ability to create an information base and to be able to reach information was crucial, but also to further build a good environment within one can deal with ERM in the best way possible, with the available tools. Notably, Ancher suggested that one needs to have the ability to collect various people and sources of information, within the company network, and then put them together. When achieving this, one would have better prerequisites to perform analysis and judgements internally, in line what would be right for the organization at large, and then apply it to various sourcing scenarios. In accordance with the theories of Kogut and Zander (2003), the ability of collecting and sharing information could be viewed as a capability of the firm, allowing the MNC to grow.

With this in mind, a well-developed and performed transfer and coordination of an ordinary capability might also, in itself, be a dynamic capability and therefore an important factor for organizational success (Teece, 2014). As aforementioned, were the case company to exceed its ordinary capabilities, in terms of information coordination, to the level of dynamic capabilities, it might aid the agility of the problem-solving in its total ERM. Furthermore, narrowing down the perspective even more onto capability transfer, since information reasonably turns into knowledge, when pooling information within the context of an interorganizational network of different business units together, in line with Ancher, a set of capabilities has been shared in accordance with Gupta (2006). This indicates that the information base of the company, if coordinated and transferred in a well-developed manner, again, could be a source of strength in its ERM efforts. As all organizations are characterized by differences in what manner information is encoded and transferred (Kogut & Zander, 2003), in the end, competition is fixed upon the differences in possession of capabilities, alongside with the speediness and innovativeness in the way these are transferred within the corporate network. Linking this to Kogut and Zander's (2003) theory on organizational growth, this only stays true if new knowledge has been created and then transferred in a way that is more effective than how competitors are performing it.

Therefore, seemingly, the ability of creating and coordinating a well-developed information base about ERR for instance within the MNC network, could be critical in understanding, as well as applying, knowledge on ERR differently, and possibly better, from one's competitors. In the next step, if these processes are performed in a manner which is hard to replicate, it has the power to build a sustainable advantage against competition in this aspect (Teece, 2014). However, it might be a challenge still, since, in line with theory (ibid) this would imply that the processes are not either as easily transferred, which might not be the sought after outcome. By reason of, in this scenario, the point is that other business units throughout the case company should be able to attain the process design and replicate the procedures easily as well.

5.2.3 Communication and Collaboration

In terms of information sharing and the generation of knowledge in ERR, collaboration and good communication is put forward as a key success factor in ERM by many of the interviewees. As Murthy emphasized, maintaining a good communication between different teams and departments with knowledge about ERR aids in predicting both the movements of the exchange rates, and dealing with these types of issues.

If one person encounters a problem, the issue might be communicated throughout the team, and a solution might be brought forward through collaboration. He also stated that the experiences of the sourcing buyers vary, much due to the fact that the team is geographically spread, which might bring great value in the end. In line with the section above on the essence of information, as the risk management skills of a firm is a capability, developing greater knowledge sharing finesse also then has a positive impact on a firm's overall risk management capabilities (Haltiwanger, 2012). General theory on knowledge creation and transfer states, if managers manage to create a platform where employees can combine newly absorbed knowledge with the existing organizational knowledge, a combinative capability within the organizational network is created, which simplifies further resource augmentation of the entire organization (Kogut & Zander, 1996). Thereupon, by applying good communication and collaboration procedures in the matter of working with ERR, a pattern of combinative capabilities is created. This might then be translated into giving rise to a form of resource augmentation which might strengthen the problem-solving capabilities of the MNC in terms of ERM. Similar to the alignment theories of Lee (2004) along with Sodhi and Tang (2012), risks are reduced through merging the interests amongst the different parties of the supply chain, through cooperation, collaboration and a close communication.

5.2.4 Prioritization and Analytical Capabilities

As mentioned by several of the interviewees such as Walker, Rodriguez and Jefferson, one needs to know when to take advantage of the exchange rate situation. This implies that information needs to be collected and the sourcing buyer needs to have the ability to analyze the supplier and exchange rate situation. In order to be able to perform this, not only information and knowledge is needed, but also the time and the right tools.

As Rodriguez put it, the issue at hand is not the challenge to change the currency, but the effort of keeping track and monitoring the relevant exchange rates. As Cook (2007) presents, firstly, the sourcing strategy of the MNC needs to be well configured, and secondly, it is crucial to always stay on top of the risks by analyzing the exposures and working to mitigate potential risks. This however then might be challenging and to only have a well executed sourcing strategy is arguably not enough in order to deal with ERM, one needs to be able to be able to prioritize the time available efficiently as well. Since, in ERR, as in other business related aspects, responsibilities of managers entail an ability to promptly recognize risks and consequently identify ways to manage them (Wang, 2015). Therefore, applying the perspective of adaptability, entailing keeping a close eye on the surroundings (Sodhi & Tang, 2012) is crucial. However, as mentioned by Rodriguez, in monitoring the suppliers, one existing risk is that the ”smaller suppliers” often gets left behind due to limits in the working time. This means that the ability to identify the risk related to these types of suppliers is low, along with the ability to activate risk reducing measures. So in order to cope with these challenges, the analytical capabilities in screening the supplier base and exposures are important, as well as prioritizing. Accordingly, as the workload could be seen as a hurdle in ERM, the more information which can be reached quickly, the better and the faster the organization gets in applying its ERM capability.

5.2.5 Negotiation Skills and Flexibility

The data shows that negotiation skills is a substantial part of the case company’s ERM procedures, where you always have to be open, informed and dedicated to reducing your ERR through supplier negotiations. Also lifted out during the interview, connecting back to the analytical and prioritization skills mentioned above, is the artistry to create mission plans concerning which suppliers to always keep an eye on and go back to, if needed. As Rodriguez accentuated, whenever the supplier is losing money, the phone rings. As aforementioned, when choosing the suppliers, no prioritization is made upon the ERR aspect. However, being able to communicate with one’s supplier is critical, and listed as one of Dickson’s (1966) top 10 criterias on supplier selection, along with procedural compliance.

The aspect of merging interests along different parties of the supply chain, through collaboration and a close communication, demands however a long-term focus along with trust building (Sodhi & Tang, 2012). If the case company often need to communicate with, and sometimes comply with demands from the suppliers and vice-versa with ambitions to work with its ERR exposures, the communicative skills of the firm are important, as a component of its ERM. On the positive side, these types of capabilities (Teece, 2014), such as communication, trust generation or conflict resolution and so on and so forth, can be developed in any part of the organization (Tyler, 2001;Ritter & Gemünden, 2003;Walter et al., 2006). It is crucial that the sourcing buyer then possesses these capabilities, since if by enhancing these, the chance of successfully maintaining a good management and level of one's ERR exposure increases. Thereupon, by strengthening the contact with the suppliers, the company may benefit from the suppliers feeling more seen and invested in, perchance helping to build trust, which in the long-term may generate other benefits to the case company.

In terms of flexibility, there are multiple examples in the data speaking of the importance in remaining flexible. This announced flexibility is however multidimensional in a sense that it focuses on flexibility in the supplier base, sourcing strategies and work time. Firstly, in terms of the supplier base, although the selection is not based on the exchange rate regime, the actual location, the geographically dispersed supplier base, generates flexibility in intermittently switching region.

Secondly, the same goes with the sourcing strategy, however this flexibility relies more on how to practically configure the sourcing, for example by using dual and single sourcing. Thirdly, Jefferson highlighted the last type of flexibility, as having to stay flexible in your work time to succeed globally, however as more of a consequence of maintaining geographically dispersed supplier -, sourcing buyer -, and business activity network. By linking this to theory (Lee, 2004;Sodhi & Tang, 2012), the trait of flexibility is translated into agility and adaptability capabilities, where one, for example, may seamlessly shift from one supplier to another, located in another geographical region ("shift capability").

The flexibility, in general, demands managerial responsiveness, so in terms of ERM, to proactively build in a agility capability into the supply chain network management can increase the profit margins and reduce ERR through the ability of exploiting currency movements of different currencies (Kogut, 1985;Kogut & Kulatilaka, 1994;Sodhi & Tang, 2012). Whereas, in terms of when the flexibility gives space to an adaptability, it generates opportunities to respond with recovery plans in a time efficient demeanor (Sodhi & Tang, 2012), well in time in order not to risk supply chain disruptions. In addition, as mentioned in the data, the size of the company relates to how scattered its business activities are. In the same light as this, the size is then linked to the high number of components and transactions the case company performs on a monthly basis. Therefore, the actual volume of goods (and services) traded is important not to overlook when talking about potential flexibility in the case company's supply chain. Even though it might bring opportunities, such as a strong "shift capability", and even if the knowledge and flexibility is coordinated in a good manner, it might cause time consuming challenges as well. In this notion, flexibility, as such, in this research is in line with the Teece's (2014) dynamic capabilities, where a well executed transfer of capabilities (for example, an "agility capability") throughout the organization may be an important factor for organizational success in its ERM processes.

5.3 Knowledge Transfers in ERM

5.3.1 How Are Knowledge Transfers Linked to ERM

As accentuated by Jefferson, there are many important aspects as to what capabilities are crucial in order to heighten the chances of being globally successful, generally. However, in terms of ERM, which individuals and what business units it is that are possessing different capabilities, which should be part of the firm's ERM, vary. As knowledge was emphasized in the data collection as one of the most critical components of an ERM capability, the linkage between knowledge transfer and ERM needs to be analyzed more thoroughly. Rodriguez interestingly mentioned that the actual ERR exposure is both faced and perceived differently, depending on the characteristics of various sourcing cases. This indicates that, in accordance with Walker, decisions need to be made on a case-by-case basis due to various and dynamic circumstances of the different sourcing scenarios.

Through this, diversified knowledge residing in different people and business units might affect the ERM outcome in total, where in some instances it might be for the better, however it might also be for the worse. This is seemingly one clear linkage between knowledge transfer and ERM, where in those instances where the ERM could be performed better, a better knowledge transfer architecture might overall bring important value. In relation with theory (Adler & Dumas, 1984;He & Ng, 1998), exposures naturally alter over time along with the sensitivity to the fluctuations, and this sensitivity is consequently based upon parameters such as the organizational structure and the currencies in play (Muller & Verschoor, 2006).

Again, the perspective of time, when focusing on ERR, is then rather crucial, where the sensitivity and amount of risk exposure only is determinable with regards to a definitive time period (Dumas, 1978). Different buyers then realizes different levels of exposure, depending on this, indicating that the actual ERR individual sourcing buyers encounter is highly dynamic in relation to the circumstantial characteristics. Therefore, it might be better to compare one case with another (through the transfer of knowledge) still, in terms of potentially realizing similarities in the magnitude of the exposure. This might be extra critical in the cases where the risk might have been perceived as smaller than the actual risk that is faced, stressing for prompt ERM actions. Moreover, the geographically spread organization structure mentioned by Murthy is also a main reason why ERM knowledge is crucial within the company.

When a problem arises, communicating with other colleagues might be the quickest way to realize a solution since similar problems might have occurred to others in the past. Without this connection between experiences, some solutions consequently might not have been reached as quickly, or rather, at all. As noted, Murthy further reveals that communication is not only confined to within the department, sometimes the sourcing buyers also collaborate with other purchasing departments to overcome challenges. This connects well to the theory of Govindarajan and Gupta (2000), articulating that MNCs are highly complicated organizations with multidimensional structures, where knowledge flows within the MNC, including procedural knowledge, best practices, etc. are not only transferred through multiple routes but also across different dimensions. In according with the collected data, knowledge flows regarding ERM include a wide range of knowledge related to currency movement forecasts, financial instruments, negotiation skills, analytical skills, collaboration and communication.

Rodriguez revealed that the more you work with ERR, or rather ERM, the more knowledge you realize that you need, again punctuating the importance of knowledge transfer. As Figueira-de-Lemosa et al. (2011) put forward, in terms of risk management, and genuinely all business processes, the actual perception gap of knowledge is growing alongside with the growth of international information platforms. Correspondingly, the size of the case company, giving room for multiple cultures, a broad currency base and a large number of goods and services traded heightens the need for capability transfers. This applies not only to ERM then, however, a good capability architecture (Vesalainen & Hakala, 2014) with well-endowed knowledge transfers would arguably work as a reassurement to the ability to reduce the risks encountered throughout the entire supply chain. As indicated by Jonsson and Foss (2011), the more knowledge an organization acquire, the more the management's perception of its inadequacy of possessed knowledge grows. To be able to coordinate and transfer capabilities within said capability architecture (Vesalainen & Hakala, 2014) would in all probability then also reduce the feeling of inadequacy, not only for the managers, but cross-functionally and through all levels of the case company.

When it comes to identifying ERR, buyers have to individually handle it. As Rodriguez further has pointed out, the working time is limited; indicating that they not always have enough time to understand, assess and carry out ERM in different scenarios, implying that some buyers do not act upon it. The study of Jensen & Petersen (2013) shows that managers have individual managerial comfort zones. Adding to this, intricate risk management, such as ERR, may force managers to step out of their comfort zones, going into the unknown. Consequently, this very much applies to sourcing buyers who lack of ERM related knowledge, once they are forced to leave the comfort zone, they may choose to ignore the problem instead of finding a solution. Yet again, this implies why existing knowledge should be fast tracked throughout the team, and different purchasing departments, namely to enhance the sourcing buyers reactiveness.

5.3.2 Improving the Knowledge Transfers within the Case Company

All interviewees agree that ERM as a capability can be better developed via knowledge transfer, which likely can benefit the case company in the long run. They also mentioned that meetings within both big groups and small groups are held for discussing ERM related issues or opportunities on a regular basis. Jefferson accentuated that the top managers, going into the meetings, proactively already have put in efforts into helping the sourcing teams to gain a better understanding of the currency trends, by providing the team with reports, and input on the right time and way to negotiate with the suppliers. Walker also mentioned that a real case from the case company's history, related to ERM, had been introduced in one of meetings, providing her with knowledge she was missing.

Linked to the theory of Kogut & Zander (1996), once managers provide a platform where employees can share newly absorbed knowledge and integrate with the their existing knowledge, the aforementioned combinative capability is generated, which makes it much easier to augment resources in a large scale company. Although the case company has already created the knowledge-sharing platform, most meetings are just on an basic information basis, according to Rodriguez, which serves the potential to increase the depth of these meetings in regards to ERR issues. Walker also shared this viewpoint and said that there was room for improvement in this aspect. She suggested that best practices for different scenarios could be carried out during these meetings, implying that this would aid in both the sourcing efforts in general but specifically in reducing ERR. On the whole, the meetings serve as an effective platform for knowledge transfer and all interviewees have a positive approach to it.

However, as implied, the meetings can be improved to bring ERM knowledge closer to their working context, for example more real cases can be added. The launch of a magazine that aims at lifting ERR challenges and various ERM solutions within the organization could also be a good way to transfer knowledge and enhance the overall ERM capability as such.

5.4 Summary of Analysis

ERM as a Critical Capability

- The case company seeks opportunities in globally dispersed sourcing activities, generating ERR exposure, in line with Adler and Dumas (1984). One of the most extremes ones is the Billing Exposure [Transaction Exposure] (Eiteman et al., 2007) due to long-term contract terms.

- As time horizons are crucial in ERM (Dumas, 1978;Adler & Dumas, 1984;He & Ng, 1998); the longer the contract terms, the more exposure, due to fluctuations becoming increasingly complex to predict, the more one extends the estimation horizon (Holweg et al., 2011;Stanczyk et al., 2017). All in all, consequences from ERR exposure might lead to financial losses for the case company, and MNCs in general (Clark & Marois, 1996;Stanczyk et al., 2017). To mitigate these risks, developing the ERM capability is central in globally sourcing MNCs.

- The perception of, and faced, ERR exposure however vary, much due to the characteristics of the buyer and sourcing location. As the ability to promptly realize the risks and ways to manage them is central, in accordance with Wang (2015), and since the consequences may be large if the exposure is overlooked, by for example a deceptive perception, applying the relevant measures of ERM is critical.

- No prioritization is made in the supplier selection based on an exchange rate criteria, which is in line with Dickson's (1966) selection criterias. Contract design capabilities in ERM may prove critical to MNCs; it serves as a risk reducing capability (Argyres & Mayer, 2007). This therefore implies and amplifies the need for ERM after signing the contracts.

- Unique process and problem-solving capabilities in ERM might reduce the ERR exposure (Teece, 2014); processes in hedging and other financial instruments presenting risk reducing opportunities, (Bennet, 2003;Butler, 2004;Eiteman et al., 2007) might demand specific knowledge and also increase overall complexity.

- The case company experiences both threats and opportunities from the fluctuating exchange rates. According to theory, ERR, for MNCs, is a double-edged sword, representing both challenges and opportunities (Clark & Marois, 1996). ERM should therefore be considered a critical capability for MNCs to prevent cost loss, but also to benefit from currency movements.

Key Success Factors in ERM

- The case company encounters challenges in identifying the factors surrounding the risks, in order to begin measuring them. As Holweg et al. (2011) present, the difficulty lies in the hidden character of the risks (inducing costs) which are materialized through inescapable alterations in the global environment surrounding the MNC (Jüttner et al., 2003). This in turn demands specific abilities in heightening the chances of succeeding with one's ERM efforts.

- **Knowledge:**
  - Due to exchange rate's almost constant state of unpredictability, reviews need to be performed on how the relevant currencies are behaving at specific times, demanding knowledge on the currencies traded with and how to identify, as well as measure, the risk (ERR) this entails.
  - Using a more proactive stance, by acquiring knowledge of the actual interaction between an MNCs external environment and its global supply chain (Jüttner et al., 2003;Lee, 2004;Sodhi & Tang, 2012) might be a more feasible way to predict the currency movements and achieving control.

- **Information:**
  - All organizations are characterized by differences in what manner information is encoded and transferred (Kogut & Zander, 2003), in the end, competition is fixed upon the differences in possession of capabilities, alongside with the speediness and innovativeness in the way these are transferred within the corporate network. The ability to create an information base and to be able to reach information in a time efficient manner is crucial in ERM, and also in the case company.

- **Communication and Collaboration**
  - Sharing information and collaborating might bring forward valuable solutions to issues encountered in ERM. As the risk management skills of a firm is a capability, developing greater knowledge sharing finesse also then has a positive impact on a firm's overall risk management capabilities (Haltiwanger, 2012).

- **Prioritization and Analytical Capabilities**
  - As well as having the ability to prioritize the time available efficiently, the sourcing buyer needs to have the ability to analyze the supplier and exchange rate situation.
  - As Cook (2007) presents, firstly, the sourcing strategy of the MNC needs to be well configured, and secondly, it is crucial to always stay on top of the risks by analyzing the exposures and working to mitigate potential risks. Accordingly, as the workload could be seen as a hurdle in ERM, the more information which can be reached quickly, the better and the faster the organization gets in applying its ERM capability.

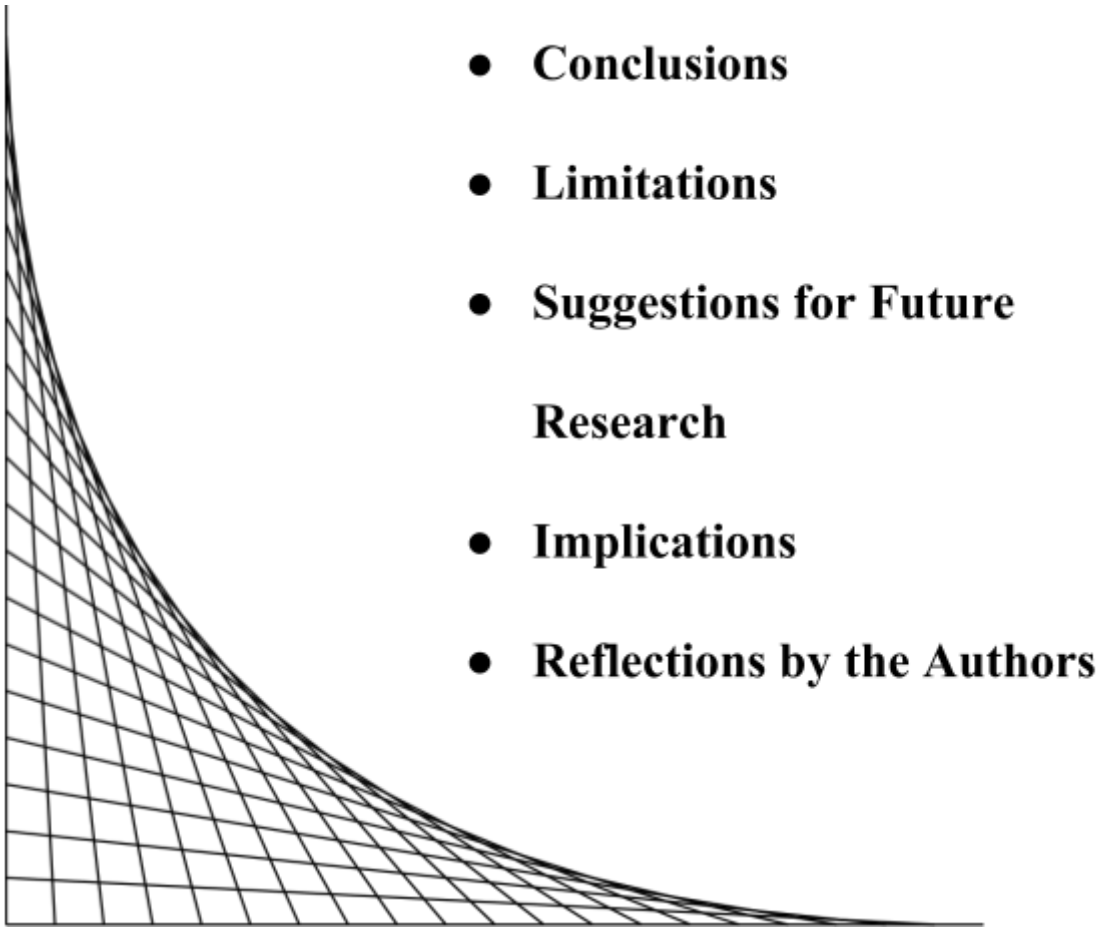
- **Negotiation Skills and Flexibility**
  - The data shows that negotiation skills is a substantial part of the case company's ERM procedures. Negotiations can be viewed as the merging of interests, along different parties of the supply chain, through collaboration and a close communication, which also generally demands a long-term focus and trust building (Sodhi & Tang, 2012).
  - The multidimensional term *flexibility*, in this research focuses on flexibility in the supplier base, sourcing strategies and work time. The trait of flexibility is translated into agility and adaptability capabilities, where one, for example, may seamlessly shift from one supplier to another, located in another geographical region ("shift capability") (Lee, 2004;Sodhi & Tang, 2012).

Knowledge transfer in ERM

- In accordance with the data, the more you work with ERM, the more knowledge you realize that you need.
- Exposures naturally alter over time along with the sensitivity to the fluctuations, (Adler & Dumas, 1984;He & Ng, 1998), and this sensitivity is consequently based upon parameters such as the organizational structure and the currencies in play (Muller & Verschoor, 2006).
- Decisions need to be made on a case-by-case basis due to various and dynamic circumstances of the different sourcing scenarios. Diversified knowledge residing in different people and business units might affect the ERM outcome in total, why knowledge transfer can work as a good control function.
- MNCs are highly complicated organizations with multidimensional structures, where knowledge flows within the MNC (Govindarajan & Gupta, 2000). Without the ability to share experiences (knowledge), some solutions to ERM issues might consequently not be reached as quickly, or rather, at all.
- As Figueira-de-Lemosa et al. (2011) put forward, in terms of risk management, and genuinely all business processes, the actual perception gap of knowledge is growing alongside with the growth of international information platforms. The more knowledge an organization acquire, the more the management's perception of its inadequacy of possessed knowledge grows (Jonsson and Foss, 2011).
- A good capability architecture (Vesalainen & Hakala, 2014) with well-endowed knowledge transfers would arguably work as a reassurement to the ability to reduce the risks encountered throughout the entire supply chain.

Table 4.3, Summary of Analysis

6. Conclusion



The main aim of this chapter is to discuss and summarize the results from the analysis chapter. In the first section of the chapter, the answer to the research question is presented in three parts: ERR reducing measures in globally sourcing MNCs today, the critical components of an ERM capability and why knowledge transfers are crucial in terms of ERM. This section is then followed by the limitations of the research. Suggestions for future research as well as academic and managerial implications are subsequently presented in this chapter. Lastly, reflections by the authors are put forth, where an ERM model for MNCs is proposed and described at the end of the chapter.

6.1 Conclusions

Existing research has shown that the various risks related to MNC's supply chains are inherent cost drivers, creating managerial challenges in coherently affecting the bottom line of the companies (Clark & Marois, 1996;Stanczyk et al., 2017). Accentuated in existing theory as especially burdensome to manage is the risk of fluctuating exchange rates, due to its almost constant state of unpredictability (Holweg et al., 2011). Consequently, MNCs need to find strength and reassurance in operational competence and well-developed ERM strategies from this marked up vulnerability, however this is easier said than done. Multiple financial risk mitigating measures are set forth in theory (Butler, 2004;Papaioannou, 2006;Eiteman et al., 2007) for MNCs to enforce. However, the theoretical discussion widely lacks of the viewing point of ERM as a pure firm capability from an international and financial interactive perspective. The set out purpose of this research was subsequently to explore how the ERM capability is handled and can be developed within a globally sourcing MNC.

Based on the research question on how ERM is handled within globally sourcing MNCs, conclusions have been derived from the analysis chapter, and will be presented in three parts below:

ERR Reducing Measures in Globally Sourcing MNCs today

As time goes by and the MNC reaches different stages of the contract term in their supplier contracts, ERR is identified as a risk on a case by case basis. This is done by the sourcing buyer in charge of said case, through individual research performances, by the help of another function in the MNC or by the managers of the sourcing team. The task is time-consuming and it implies regular tracking of the relevant exchange rates, which may vary depending on the responsibility areas or sourcing region (case by case). Accordingly, the type and size of the exposure is then identified, based on the knowledge, perception and ability to perform this type of risk identification.

Forthwith, when the potential ERR exposure have been fully identified, the sourcing buyer decides to take action. The timing of this occurrence depends on multiple factors, however, such as the leverage, workload, exchange rate movements and the sourcing buyer's knowledge. Which type of action that is being carried out depends on the MNC and its overall ERM procedures, whereas there, in general, are multiple ways to carry out ERR reducing measures. Firstly, one way is to put usage to a currency clause in the supplier contracts, either all or only some. By this notion, when the MNC locks down a deal with an optimal supplier, a contract is signed with said supplier, formulating the terms of the arrangement. These terms include, for instance, price per piece and the quoted currency. The contract design may or may not then imply that a currency clause, aiming to adjust matters of exchange rate risk, is included. If a currency clause is included, a choice of terms on how to handle upswings or downswings in the specified quoted currency are agreed upon between the buyer and the supplier.

Secondly, the MNC might take action by going back to the supplier to discuss and reach an agreement on how to proceed with the identified current risk exposure. This is achieved by (i) splitting the benefits the supplier is realizing from the prevailing exchange rate movements, or to get a percentage reduction on future components. In the end of the contract-term, this method might be used by holding an extension of the supplier contract as collateral. Also, it can be accomplished (ii) through the MNC proposing a change in the payment currency, if the current payment currency is experiencing a great depreciation. However, these types are demanding of negotiations, which might be difficult and time-consuming for the MNC.

Thirdly, the MNC might have the choice to pro-actively configure one's sourcing processes in a way that local sourcing, or dual sourcing, procedures are put to use, in order to avoid the currency conversion, or being able to compensate for it through dual sourcing options. This might be done, for instance, with the most critical parts and/or with the more high value or high volume parts. Forth, other measures to reduce ERR could be enforced by the usage of financial derivatives. These types of measures demand specific knowledge in the finance related aspect, why ERR can be handled by these types of methods only if the systems and knowledge on this are in place. Whether the MNC chooses to proceed with one, or multiple ones, of these ERR reducing measures, throughout this process, meetings might, and should, be held. During these, the topic of ERR, ERM experiences, and future potential issues related to it, can be raised and discussed, shallowly or more profoundly. Overall, by creating well-coordinated ERM strategies, the MNCs can develop its total ERM capability in order to deal with ERR in a more effective and efficient demeanor.

The Critical Components of an ERM Capability

Despite the fact that the opinions in the various cases in some aspects diverged, several common denominators were identified in terms of what critical components exist, or rather should exist, in a ERM capability. By developing these, the overall ERM capability of the MNC will consequently be enhanced:

Knowledge:

- About the actual exposure [identification] and the consequences if it is unregarded for [measurement of the type and size of the exposure]
- About the different currencies which are dealt with on a case by case basis
- On the historical behavior of the relevant currencies [trend creation]
- On the drivers of the exchange rate fluctuations
- On how to reduce the ERR using risk reducing measures [ERM]
- On when to take advantage of/action to the exchange rate movements
- Brings speed, bringing value to the ERM in the ability of taking action quickly

This comprised list of various knowledge aspects of ERM is denominated later in the conclusion, by the authors, as *the multidimensional tool knowledge*. Further, as exchange rates fluctuate, the management of ERR also fluctuates. It is only a matter of how much knowledge the sourcing buyer has of the issue, how responsive she is to her surroundings and how quickly she can take action, knowing which ERM method to use.

Information

- By transferring information about ERR, the MNC will have achieved better prerequisites to perform analysis and judgements internally, in order to apply adequate solutions to various sourcing scenarios.
- When pooling information within the context of an interorganizational network of different business units together, a set of capabilities has been shared. Consequently, if an MNC manages to exceed its ordinary capabilities, in terms of information coordination and transfer, to the level of dynamic capabilities, it might aid the agility of the problem-solving in its total ERM.

Communication and Collaboration

- Maintaining a good communication between different teams and departments with knowledge about ERR aids in predicting both the movements of the exchange rates, and dealing with these types of issues.
- Developing greater knowledge sharing finesse also has a positive impact on an MNC's overall risk management capabilities.

Prioritization and Analytical Capabilities

- Information needs to be collected, implying that the sourcing buyers in an MNC need to have the ability to prioritize and analyze the supplier and exchange rate situation.

Negotiation Skills and Flexibility

- Negotiation skills are a substantial part of the ERM procedures in MNCs, where you always have to be open, informed and dedicated to reducing your ERR through supplier negotiations.
- The aspect of merging interests along different parties of the supply chain, through collaboration and a close communication, might strengthen the supplier contacts through trust building and long-term relations.
- Flexibility is a critical component of the ERM capability, meaning: flexibility in the supplier base, sourcing strategies and work time.
- If an adequate level of flexibility is created, it might bring higher levels of agility and adaptability abilities into the MNC's overall ERM capability.

Why Knowledge Transfers are Crucial in Terms of ERM

All of the skills brought forward in the section above, such as speed, analytical capabilities, collaboration and knowledge, are deemed as crucial to possess, by the interviewees, in order to succeed in one's management of ERM. Seemingly, knowledge is the more multidimensional term, emphasized by every single one of the interviewees, indicating that if you have this under control, you might be able to reach the tools to begin managing the unmanageable: fluctuating exchange rates. In order for this to stay true, however, not only possessing the knowledge is enough. It needs to be coordinated and transferred in a suitable manner as well between different individuals throughout the network of the MNC. If this is achieved, based on the outcome that knowledge brings speed in terms of ERM, the sourcing buyer's reactiveness can be enhanced in their ERR reducing efforts.

Furthermore, also the ability of creating and coordinating sophisticated knowledge about ERR, within the MNC network, could be critical in understanding, as well as applying, knowledge on ERM differently, and possibly better, from one's competitors. The isolation of existing knowledge residing in the different individuals in the MNC from other individuals in said corporation should by this notion not exist, in terms of reaching a higher level of the ERM capability.

For example, if a sourcing buyer, responsible for reducing ERR in a specific sourcing case is lacking the right knowledge, in terms of any one of the criteria listed under *the multidimensional tool knowledge* above, the financial consequences could be large. This is then consequently yet another conclusion as to why existing knowledge on ERM should be fast tracked throughout the individuals, teams, and different departments of the MNC. In sum, the dynamic approach applied, to the multidimensional tool knowledge, in the MNC is important in developing one's ERM capability. Maintaining a static approach, by for example not moving the knowledge between the nodes of the MNC might prove fatal or less effective to its ERM, due to missed opportunities to catch the risk, or opportunities, of the fluctuations.

6.2 Limitations

This research is only based on one purchasing team within the case company. Due to the limited empirical data interviewed in this study, the findings may not perfectly suit other contexts. The operations of different MNCs are for one highly dynamic and may also significantly vary, which will therefore result in different indirect and direct impacts on the ERR exposure and in the next step, the ERM. If seen as individuals, MNCs may have developed their own ERM to mitigate ERR according to a good fit with their operations. Key success factors in ERM may subsequently differ between different MNCs, although this study aimed to explore the ERM capability as to fit MNCs in general. However, due to this, there are clear limits in regards to the transferability of the results.

Another limitation is the size of the firm. The case company is a large-scale MNC with a purchasing value around 78 billion SEK every year. All processes in such big organizations, such as the purchasing process, knowledge transfer, and so on, are presumably usually much slower than they would have been, if performed in a smaller sized company. The differences in size then possibly distinctly create differences on the flexibility, and the ability to perform ERM, in the firm.

Furthermore, although all the interviewees are experienced sourcing buyers, frequently facing ERR, they all expressed a concern of them not being experts in this topic. This might however be a personal trait, and not limiting to the research as such, since while given the chance to speak freely about the topic they all contributed with interesting insights. Also, academic studies in terms of ERM as a firm capability from a financial and capability interactional perspective are limited.

6.3 Suggestions for Future Research

For future research, the authors suggest that case studies would be performed in different MNCs, including small, medium and large firms. Ensuring a variety of cases will make the findings more generalized and suitable for different contexts, providing the field of finance and International Business, as well as managers, with an even more comprehensive understanding and development of ERM in MNCs. When conducting case studies of this sort, different business units should also be involved in the research, since the topic is related to knowledge transfer. Both horizontal and vertical knowledge transfers can be better viewed with different units being taken into account, why it would also be convenient to execute a research on the challenges of transferring knowledge related to ERM, depending on the characteristics of said knowledge or of the concerned individuals. Moreover, since the research related to the relationship between ERM and knowledge transfer is limited so far, case subjects should be aimed to be experienced in global sourcing as well as the ERM area.
The authors, as follows, list a few different angles for future researchers: How is the size and geographical spread of the company affecting the company's ERM? Does knowledge transfer directly affect ERM? What are the major challenges in transferring knowledge of ERM throughout the MNC network? If using financial instruments extensively, could this completely eliminate ERR?

6.4 Implications

This research has provided insights on the fact that sets of knowledge transfers are crucial to develop the ERM capability within an MNC. In terms of managing exchange rate fluctuations, previous research has mainly focused on using financial derivatives as risk reducing measures. In the end, there is no doubt that these financial derivatives manage ERR to a large extent. However, due to various practical factors, such as time and financial constraints, lack of knowledge, heavy workloads, the increase of complexity, etc., an unknown number of MNCs are not able to put these derivatives into place in a well-acted manner. This is one implication for the academic researchers, investigating the field of ERR and ERM. Moreover, other kinds of organizational capabilities are worthy to take into consideration, in terms of management, combining these with financial instruments.

Narrowing down the focus to the implications for the case company, there are three main suggestions proposed by the authors. First and foremost, the case company should reasonably allocate qualified human resources to undertake hedging strategies to the maximum benefit of the company. Secondly, the case company should develop their contract design ability, adding clauses related to highly volatile exchange rate fluctuations, in order to attain higher levels of control by reducing passivity. The last implications is for the managers, or other relevant individuals in the MNC, to enlarge the knowledge transfer platform within and between the different business units. The larger the knowledge network is, the more new knowledge people can get, the faster risks might be mitigated.

6.5 Reflections by the Authors

Based on the theoretical framework and the data collection, the authors recognized that every individual in the case company has their own understanding of what an ERM capability is, as well as, that there is no systematic and comprehensive ERM concept rooted in the sourcing teams in the case company. Existing academic researchers were likewise not presenting a comprehensive and clearly defined model, or approach, in terms of ERM. Therefore, in addition to the results presented above, the authors will propose an ERM model (see figure 6.1).

It consists of three major parts, confining the main parts of an ERM model, based on existing research and this study: exchanges rate risks, risk mitigation methods and capability transfer.

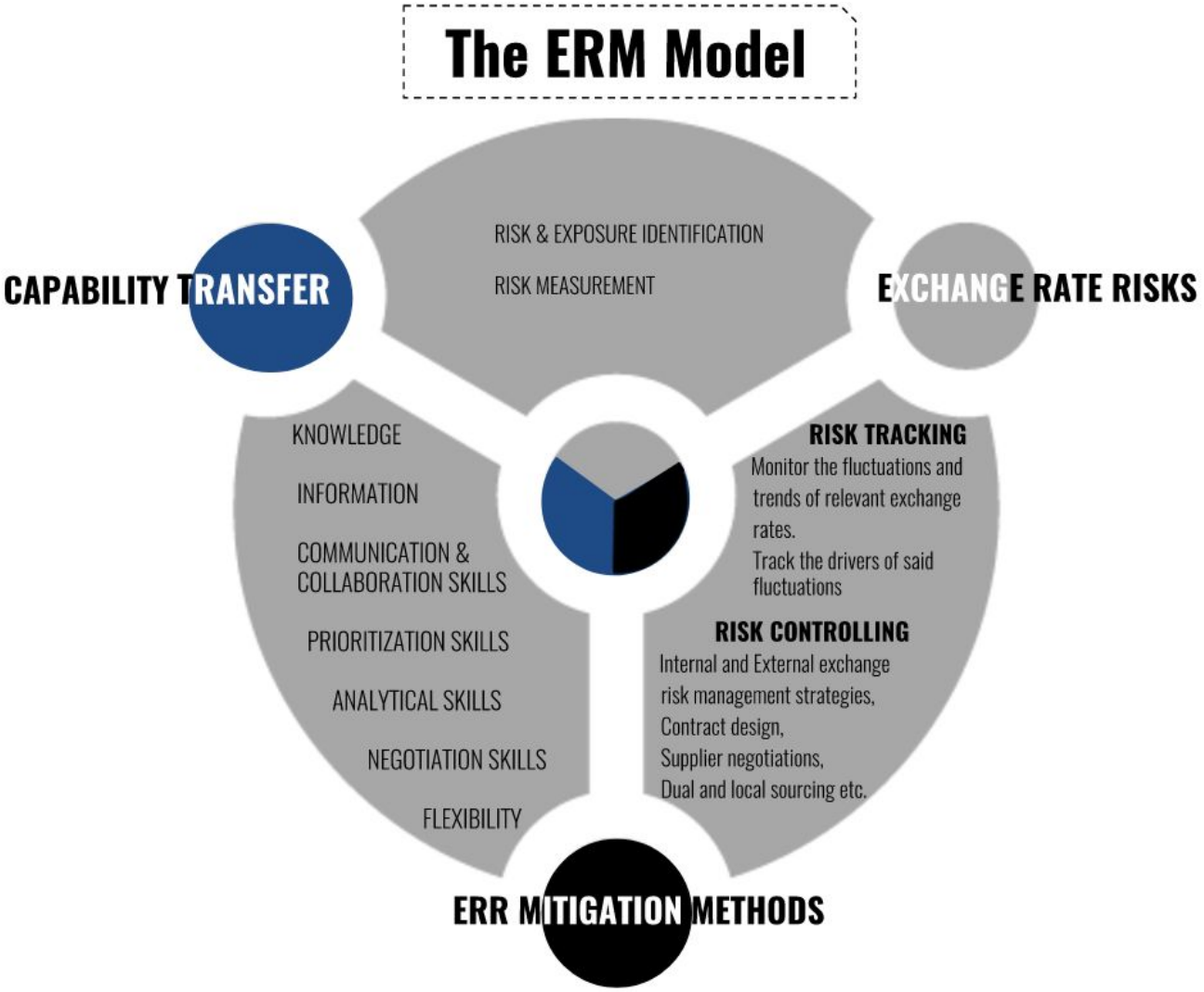


Figure 6.1, The ERM Model, Authors Creation

Exchange Rate Risks

This part focuses on the ability to identify and measure ERR. The first step is to identify the risk and the exposure. Secondly, the size and type of exposure needs to be measured (assessed). Since the floating exchange rates move by the minute, the ability to calculate potential loss (consequences) or gain (possibilities) from the exchange rate fluctuations is needed.

ERR Mitigation Methods

This part is about various methods to control (reduce) ERR in the different stages of various purchasing scenarios. This element is divided into two, namely, risk tracking and risk controlling as presented below:

Risk Tracking

Since most sourcing contracts are long term, sourcing teams need the ability to track the movements of the exchange rates, as well as learn to see the trends in order to stay on top of the risks. In addition to this, in order to stay proactive, it is important to keep an eye on the historical behavior of the relevant exchange rates in each sourcing scenario.

Risk Controlling

The risk controlling part focuses on the different types of action which can be carried out in order to reduce the exposures to ERR. The first component entails the internal and external risk mitigation strategies available in the financial field of risk reducing practices. The second encompasses the skill of contract design, where the ERR can be regulated at the time of the contract signing. Consequently, the third one focuses on the method of returning to the suppliers, to negotiate terms and actions for ERR reducing measures. Lastly, other forms of risk controlling in a sourcing scenario might be applied through the usage of dual or local sourcing strategies.

Capability Transfer

In the analysis and conclusion chapters of this thesis, various critical components of the ERM capability at large have been put forward. In the reflections of the authors, these are denominated as *key success factors* in ERM, where all of these are consequently viewed as various skill-sets, or "capabilities" in accordance with Teece (2014). In order to be consistent with the sufficient usage of different ERR mitigating methods, MNCs need to create a platform for sharing and imparting related skill-sets within the corporate network (Gupta, 2006).

The capability transfer not only refers to hard knowledge, such as how to implement specific strategies, contract design, analytical skills, etc., but also covers soft knowledge, such as negotiation skills, flexibility, communication, collaboration and information sharing. By creating a well-coordinated capability architecture, in accordance with Vesalainen and Hakala, 2014, where capabilities are transferred (Haltiwanger, 2012;Gupta, 2006), the MNCs can develop its total ERM capability in order to deal with ERR in a more effective and efficient demeanor.

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Appendixes

Appendix I - Interview Question Guide

PART 1 Risks in Global Sourcing and ERR

1. What is your job title and your main area of responsibility?

2. Do you think exchange rate risk is one of the biggest risks in Global Sourcing, compared to other risks?

3. How much money do you [your purchasing dptm] spend on purchasing activities annually? As a percentage share of this amount, how much do you lose due to exchange rate risk [every year]?

4. How many different kinds of currencies do you manage on a day to day basis?

5. How do you split these currencies in terms of percentage [20 % EUR, 30% USD etc.]?

6. What are the major issues/difficulties you see in terms of *forecasting* these fluctuations with the different situations/purchasing scenarios that you have? In other words, what according to you drives/plays a major role, in creating a currency risk, for you?

7. What do you see are different options to mitigate currency risk? Methods which might not be used today, or "improvements" to add to existing methods.

PART 2 The Exchange Rate Risk Management Model

1. What is your opinion on currency risk management? What important capabilities do you see as important to be able to cope with exchange rate risks?

2. What are your current routines in transferring knowledge on this topic?
    a. What do your knowledge sharing routines look like?
    Ex. Do you have meetings regularly on the topic? Frequency of meetings?
    b. How closely do you monitor the exchange rates?
    c. Would you need more resources to cope with these issues?
    d. Would it be a good idea of having a magazine/monthly report sent out?
    e. Do you continuously assess exchange rate risks and then develop routines for an incident [i.e. scenario] which might never occur?

3. Do you think the communication between the different business units now is good enough?
    a. If you could develop the knowledge transfer between the different business units, do you think it would be helpful in mitigating the faced exchange rate risks?

4. To sum up, with the potential goal of putting together a model bringing forward all the critical parts of dealing with the risk of fluctuating exchange rates in global sourcing, in this last part of the interview we want to see if we can receive any additional thoughts on what factors could go into this model:

    Lastly, using your expertise, in your own words/opinion: What should an ERM [Exchange Rate Risk Management] model include?
    a. What are the key success factors in dealing with exchange rate risks?
    b. What are some key success methods to work with in dealing with these risks?
    c. In a perfect world: How would you say an optimal routine/working plan would look like - dealing with ERM?

Appendix II - All Currencies

USD - U.S. Dollar

RMB - Chinese Yuan

JPY - Japanese Yen

BRL - Brazil Real

EUR - Euro

SEK - Swedish Kronor

INR - Indian Rupee

GBP - British Pound

Appendix III - Numerical Explanations of the Financial Derivatives

Outright Currency Forward Contract

Example: Company A, an Indian company, has signed a contract to source parts for 100,000 USD from a US supplier on 1st April. A expects to pay the supplier in 90 days.
$ represents US Dollar, Rs. represents Rupee (Indian local currency)

- Current exchange rate (1st April) is $ 1 = 50 Rs.
- At spot rate, A expects to pay Rs. 5000,000 (100,000 * Rs. 50)
- The exchange rate in 90 days may change to 1USD = 51 Rs. If that happens, A would pay Rs. 5100,000 in local currency (Rs. 100,000 more, compared to original expectation)
- To manage this potential loss, Company A decides to enter into an outright forward contract with the bank.
- The bank quotes the 90 days forward rate of Rs. 50. 30 to purchase the USD

On the settlement date (on 90th day)

- Company A delivers to bank Rs. 5030,000
- Bank delivers to Company A $100,000

If, spot rate is 1 USD = 49 Rs. on 90th day

- A will only pay Rs. 4900,000 to buy $100,000 if A didn't enter into CFC
- A's forgoes = Rs. 130,000 (5030,000 - 4900,000)

If, spot rate is 1 USD = 52 Rs. on 90th day

- A will need to pay Rs. 5200,000 to buy $100,000, if A didn't enter into CFC
- However, with CFC, A only needs to pay Rs. 5030,000

Non-deliverable Forward Contract (NDF)

Example: Company A, an Indian company, has signed a contract to source parts for USD 100,000 from a US supplier on 1st April. A expects to pay the supplier in 90 days.
$ represents US Dollar, Rs. represents Rupee (Indian local currency)

- Current exchange rate (1st April) is $ 1 = 50 Rs.
- At spot rate, A expects to pay Rs. 5000,000 (100,000 * Rs. 50)
- The exchange rate in 90 days may change to $1 = 51 Rs.
  If that happens, A would pay Rs. 5100,000 in local currency (Rs. 100,000 more, compared to original expectation)
- To manage this potential loss, Company A decides to enter into a Non-deliverable forward contract with the bank.
- The bank quotes the 90 days forward rate of Rs. 50. 00 to purchase the USD
- They decide to settle the contract in one currency, Rupee
- It needs to noted that in NDF, exchange of currencies doesn't take place

On the settlement date (on 90th day)
If, spot rate is 1 USD = 51 Rs. on 90th day

- Rs. 5100,000 is needed to buy $100,000

- A only need to pay Rs. 5000,000, the bank will compensate the rest Rs.100,000
- Total amount A pays = Rs. 5000,000

If, spot rate is 1 USD = 49 Rs. on 90th day

- A needs to pay Rs. 4900,000 to buy $100,000, and also need to pay bank Rs. 100,000
- Total amount A pays = Rs. 5000,000

Currency Futures

Example: Company B, a U.S. company, has signed a contract to source parts for £100,000 from a U.K. supplier on 12nd June. B expects to pay the supplier on 10th August.
$ represents US Dollar, £ represents British Pound

- Today's exchange rate (12nd June) is £ 1 = $ 1.56
- According to the spot rate, B expects to pay $ 156,000 (£ 100,000*1.56)

B buys September Future today (12nd June) at a fixed rate £1 = $ 1.54, in order to eliminate currency fluctuation.

1) On 10th August, the spot rate goes up by 0.02, September future rate also goes up by 0.02

- Spot rate: 1.56+ 0.02 =1.58
- September future rate: 1.54+ 0.02 = 1.56

- Transaction: convert at the spot rate to pay supplier

B pays £100,000 * 1.58 = $ 158,000
Sell future deal: B gains £100,000 * (1.56 – 1.54) = $ 2000
Net: $ 156,000

2) On 10th August, the spot rate and September future rate both fall by 0.01

- Spot rate: 1.56- 0.01 =1.55
- September future rate: 1.54 - 0.01 = 1.53

- Transaction: convert at the spot rate to pay supplier

B pays £100,000 * 1.55 = $ 155,000
Sell future deal: B losses £100,000 * (1.54 –1.53) = $ 1000
Net: $ 156,000

Note: We can call the above two examples "perfect hedge", which completely removes currency fluctuation. However, in practice, "perfect hedge" is impossible to get. There are two main reasons for this:

1. Future deals have to be in fixed size contract, it can not hedge any amount of money. Company B may cannot hedge exact £ 100,000.
2. The movement in futures will follow the same trend of the movement in spot rate, however, it will not exactly equal to the movement in the spot rate.

Currency Option - A Call

Example: Company C, a U.S. company, has signed a contract to source parts from a Chinese supplier. C expects to pay the supplier 100,000 RMB in 30 days.
$ represents US Dollar, ¥ represents RMB

- Company C buys a call in order to prevent RMB appreciation.
- A call: C has right to buy RMB at the rate $1 = ¥ 6.8 on 30th day

On 30th day

1) RMB appreciation, Spot rate is $ 1= ¥ 6.5,
   According to spot rate, C needs to pay $15,385 (¥ 100,000 /6.5) to supplier.
   However, if C exercises the option, C only need to pay $14706 (¥ 100,000 /6.8)
2) RMB appreciation, spot rate is $1 = ¥ 7
   According to spot rate, C only needs to pay $14285 (¥ 100,000 /7) to supplier.
   At this point，C don't exercise the option.

Currency Option - A Put

Example: Company D, a Germany company, has signed a contract to sourcing parts from a U.S. supplier. D expects to pay the supplier 100,000 USD in 30 days.
$ represents US Dollar, € represents EUR

- Company D buys a put in order to prevent EUR depreciation.
- A put: D has right to sell Euro at the rate €1 = $1.3 on 30th day

On 30th day

1) EUR depreciation, spot rate is €1 = $1.2 ,
   According to spot rate, C needs to pay €83,333 ($ 100,000 /1.2) .
   However, if C exercises the option, C only need to pay €76,923 ($ 100,000 /1.3)
2) EUR appreciation, spot rate is €1 = $1.4 ,
   According to spot rate, C needs to pay €71,429 ($ 100,000 /1.4)
   At this point，C don't exercise the option.