

**An evaluation of managers' behaviour towards high-tech machinery
relocations to China**

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Abstract

Setting up a new supply chain is a systematically and technically complex process. The theories and existing models used in this process have been developed for common industries or consumer goods, but to the best knowledge of the researcher, a theory or model has not yet to be established for high-tech machinery for capital equipment in the semiconductor, display and solar industry. These key sectors are part of the “China 2025” programme to enhance manufacturing capability development, research and development commitment, and human capital investment.

Although there are a few isolated but significant studies on relocation, outsourcing and offshoring, there is comparatively little empirical research on how relocation practitioners perceive attitudes and how competencies influence their intention for management systems and tools after the organisation has already prepared for outsourcing. This study, which uses a human behaviour perspective to fill this knowledge gap, examines how managers perceive the value of and choice in methods and tools, how those interpretations (expressed in their beliefs) in turn influence their behaviour, and which type of relocation operations they prefer and choose in their future intention for offshoring.

This study constructs a theoretical model to explain the fundamental linkages between beliefs and usage in relocation management by supply chain/operations practitioners, because many supply chain management-focused studies lack significant theoretical underpinnings. To achieve the intended outcome for a model derived from the technology acceptance theories, the theory of planned behaviour (TPB) was adapted. A quantitative study design was used to empirically validate the conceptual model, which was theoretically grounded. To determine whether the identified measuring items adequately represented the main theoretical model constructs, a pilot study was conducted. The main study's findings were analysed using multinomial logit regression and structural equation modelling. This model is based on the direct impact of the most important predictor (manager's attitude) by controlling for social pressures and skills. This refers to unstructured influences from peers and management of supply chain / production practitioners.

This study's main theoretical contribution is that it integrates supply chain and production practitioners into the relocation efforts adapted to the TPB model. Second, this research advances knowledge by developing a model for the high technology business that is more theoretically sound than the "make or buy" models that have previously been used. By applying an inner and outer model, this research was able to evaluate both aspects simultaneously, the factors that determine intentions, as well as the factors that influence the behaviour of interest in the next three to five years. The model offers an insight into the beliefs of supply chain and production relocation management practitioners, and management support, as well as an understanding of how the classification of core competences plays a crucial role in the managers intention for the selected the relocation operation mode. As a result, the study's practical contribution to business managers enables them to suggest targeted interventions and better develop strategies to realign unfavourable beliefs and resistance to relocation and open the door to sustained, long-term efforts that organisations must make to achieve successful relocation.

Declaration of Originality

I thus certify that this thesis does not, except where appropriate citation is provided in the text, integrate without acknowledgement any material previously submitted for a degree or diploma in any university. To the best of my knowledge, this thesis also does not contain any materials that have been published or authored by someone else.

Franz Fritz

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Abbreviations

6σ	six sigma
AVE	average variance extracted
AGFI	adjusted goodness of fit index
AMS	attitude of management support
ALOUR	attitude of level of understanding for relocation management
APDCC	attitude of perceived development of core competences
ALD	attitude of the motivation for localisation driver
BCC	best cost country
BRIC	Brazil, Russia, India and China
CFI	comparative fit index
CMV	common method variance
CPO	Chief purchasing officer
CR	composite reliability
D	Mahalanobis distance
D2	squared Mahalanobis distance
DACH	Germany, Austria and Switzerland
df	degree of freedom
GDP	gross domestic product
GFI	goodness of fit index
HRM	Human resource management
IS	information systems
ISO	International Organization for Standardization
IT	Information technology
KPI	Key performance indicator
LCC	low cost country
MDRU	managers decision on relocation and use
MIRM	managers intention toward relocation mode choice
ML	maximum likelihood
MNC	multinational corporation

MS	management support for SCPRM
N	total population size
n	total sample size
NFI	normed fit index
N _h	population size for stratum h
n _h	sample size for stratum h
NNFI	non-normed fit index
PBC	perceived behavioural control
PDCA	Cycle plan – do – check – act cycle, or Deming’s cycle
PGFI	parsimonious goodness of fit index
PNFI	parsimonious normed fit index
R&D	Research & development
RMR	root mean residual
RMSEA	root mean squared error of approximation
RMSR	root mean squared residual
SC	Supply chain
SCM	Supply chain management
SCPRM	Supply chain / production relocation management
SCRM	supply chain risk management
SEM	structural equation modelling
SMEs	small and medium-sized enterprises
SP	social pressure
SPSS	Statistical Package for Social Science
SRMR	Standardized Root Mean Residual
TAM	technology acceptance model
TPB	theory of planned behaviour
TRA	theory of reasoned action
UTAUT	the unified theory of acceptance and use of technology
χ^2	chi-square
χ^2/df	chi-square/degree of freedom

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1. Introduction

The study's outline is presented in this chapter. It begins by defining the purpose of the study before moving on to its setting. The study's history and sources of inspiration are then given, along with a justification of the research, its purpose, and goals. It also highlights the value of the research and presents the research terms selected. Next, the research issue, context, and research gaps are determined. The research's potential contributions for various target audiences are discussed. There is also a roadmap for each chapter and a summary of the research. The literature review component is covered in the next chapter. A schematic representation of the important components covered in the introduction is displayed in Figure 1.



Figure 1 Schematic overview of sections within the introductory chapter

1.1. Motivation of the research

In the era of globalization, supply chain/production relocation management (SCPRM) is essential for running and managing supply chains successfully (Shou & Wang, 2017; Vokurka, 2011). Different strategies can be used to relocate. The corporation can carry out these functions either through its own subsidiary in a different country (internal relocation) or by contracting out to individual firms based abroad (external relocation). The significance of SCPRM in today's global economy has been recognized by numerous research papers and reported public information sources. This is partly as a result of the rise in global relocation activity. This has highlighted the openness of contemporary global supply networks even more. Unfavourable business tactics in the supply chain management and production relocation have exposed numerous businesses globally to major delays, materially unfavourable financial effects, and other detrimental business effects (Deloitte, 2020; Nicita et al., 2013).

In addition to my general management duties, I have spent the past 15 years of my professional career significantly involved in supply chain and manufacturing relocation activities, for various foreign enterprises operating/supplying/relocating high-tech machinery in China. In that time the inappropriate use of SCPRM approaches, techniques, methodologies, and tools along process frameworks has resulted in both direct and indirect unfavourable occurrences that have had a substantial impact on the nodes of the corresponding global supply chains. Among them were issues with financial network participants, improper supplier selection, a lack of know-how transfer, a lack of communication between the supplier and headquarters, and the selection of the incorrect people with insufficient skills for management positions. Over

those years, the significance of senior management support for SCPRM and their expertise with the topic remained steady. Modern supply chain management is undoubtedly impacted by the growing complexity of today's supply networks, which is partly a result of globalisation, optimisation, formal legal changes, new technology, and numerous both macro and micro patterns for industrial structures. Outside of the body of existing literature, little research has been done to investigate potential linkages and hazards that also takes into consideration the complexity of such systems (Buckley & Ghauri, 2004; Levy, 2005; Pedersen, 2013; Scherrer-Rathje et al., 2014). This has motivated academic and professional scholars to examine the circumstances and issues that currently exist in SCPRM.

This study uses an explanatory theory approach to examine the chosen topic of supply chain and production relocation management (SCPRM), concentrating on the intentions of the target population (labours of organizations in supply chain & production) and the motivating elements behind those intentions (Saunders et al., 2009). Social sciences and a wide range of other disciplines use data on the motivations influencing human behaviour since it is crucial to comprehend and shape behaviour when making localization choices.

The target of this research is to investigate the effects of external aspects on individuals' beliefs, attitudes and intentions in a relocation process, based on an established conceptual model to test hypotheses and assess. This is done to provide illustration, prediction and explanation to address stated research questions. Increased knowledge and strategically focused educational and support efforts are expected to benefit practitioners and academia in addition to advancing communication and the expansion of theory among stakeholders in the field of SCPRM. However, the benefits of a successful relocation management are primarily measured in financial terms.

1.2. Positioning of the study

Globalisation is a process driven by international trade and investment between different nations (Meyfroidt et al., 2013). In the last fifteen years, globalisation has, and is still having, a huge impact on supply chain development and production shifts to best cost countries (BCC), by shifting labour intensive, export oriented manufacturing operations to rising markets (Wu & Jia, 2018). Compared to low cost country (LCC) sourcing, supplier decisions are not taken to attain low prices and labour costs; rather, other factors like long-term sustainability, inflated wage rates, greener supply chains and compliance requirements characterise the value of the BCC approach (Dutzler, 2011). Out of the global manufacturing competitiveness index of Deloitte (2016), BRIC (Brazil, Russia, India and China) states and developing countries still have a lower output of high technology exports, as confirmed by Schwab and Zahidi (2020), which might aid in the embedding of a transition that could produce better results for productivity and growth. Customers in the machinery and equipment business for high technology capital equipment also demand more domestic content to obtain other benefits, such as tax exemptions or subsidies to achieve a lower cost base for production. These companies

must overcome external and internal boundaries, especially in the equipment industry for semiconductors, display and solar, which is the focus of the study, where low volume and a high mixture of products, customer demand and make or build to order concepts (Gunasekaran & Ngai, 2005; Wu & Weng, 2010) push companies into a reactive mode (Waters & Rinsler, 2010). Consequently, organisations are forced to follow these requirements without making strategic decisions. A global view for the approaches derived from the changed environment to establish visions is missing.

As stated by Porter (2008), the company needs to understand that success comes either with cost advantage or in differentiation of the product from their competitor (Morgan & Hegarty, 1998). To achieve a cost advantage, the supply chain must be designed to be more agile and leaner (“leagile”) for most of the consumer products to individualise from their competitors. As a high mixture of different products are challenging today’s supply chain strategies, this research intends to review a more “leagile” (flexible and economic approach) to supply chain setup (Christopher, 2000) with the development of a model for core competences of global companies for supply chain localisation. Since the focus is defined to going further into in the equipment industry for semiconductor, display and solar, the majority of investments, manufacturing and installations of those factories are in China (Kong et al., 2016; Sun & Grimes, 2016; Zhang & Gallagher, 2016). The intention is to investigate the current practice of production/supply chain localisation in China, analyse the operation mode in decision making of the top management and find a successful practice model for it. Additionally, the study identifies structures and summarises existing core competences originated by resources and knowledge that influence manager intentions in relocation decisions. Furthermore, it will investigate possible development paths for further core competences. It should give companies insights into the current status, tools and methods applied to support a localisation process in the production/supply chain (Şen et al., 2008), to enable strategic steps in exploration of growth and new resources in alternative markets . It should be a contribution to social science in this research field of supply chain localisation by understanding the rationale behind localisation decisions and exploring further the key elements of core competence development in this process.

1.3. Background and key characteristic of production relocation

As a result of incorrect or misinterpreted information being used in decision making processes, complex management organizations often implement inappropriate management practices (Haleem et al., 2018). Localisation is defined as the process of making something regional in character or restricting it to a particular geographical place (Di Mauro et al., 2018). According to Lutz and Ritter (2009), the literature on the study of localization in relation to supply chains for machinery equipment is largely comprised of single case studies, and it is still relatively undeveloped for academics and supply chain professionals. This may be attributed to elements such as forces for localisation, new manufacturing technology, institutional changes, or other

emerging trends as a result of globalisation (Deloitte, 2020), which will be examined in this study.

In the field of globalisation, research has been undertaken for lower cost sourcing, manufacturing, logistics and other operations driven by high facility or energy costs (Contractor et al., 2010; Liu et al., 2014). Some indications, conclusions and recommendations to achieve the required quality and performance, suggested by Hameri and Hintsa (2009) in their research about strategic supply chain planning in the next decades, have received increasing attention by researchers in the last ten years. Reducing the complexity of the product and the manufacturing setup, including business processes, tend to be research objectives in several studies in this field (Squire et al., 2009).

A localisation process affects multiple sources including process environment and all persons involved in such a system (Buckley & Ghauri, 2004; Di Mauro et al., 2018). This study intends to improve the understanding of human behaviours, in specific the perceived recognition of existing core competence in localisation decisions, and to try to close these gaps for a better understanding in this complex area of supply chain and production localisation for high technologies. Besides the experience of how people manage such a process, the first step is to explore and understand the key characteristic drivers and factors, as explained in the next section.

Supply chain managers focus on reducing costs and lead-times, reducing variance between purchase prices and applying “Just in Time”(JIT) concepts to reduce inventory (Green Jr et al., 2014). Today, the supply chain represents an important element of an organisation's ability to meet the needs of all stakeholders (Chikán & Gelei, 2010) and to execute and contribute to the business success of such organisations.

The following summary of the key points and localisation drivers and factors should illustrate the increased understanding and openness of today’s supply chain and production location developments.

1.4. Business Environment of the high-tech industry

The Semiconductor, Display and Solar industry relies a lot on vacuum equipment in its related production factories. Vacuum equipment, with its subcomponents combined, make up the biggest cost on the bill of materials for semiconductor OEMs. For example, the semiconductor industry consumed almost \$2.7 billion worth of vacuum subsystems in 2020, with over 60% supplied by vendors with their headquarters based in Europe (West, 2021). Substantial share gains by MNC companies in the DACH region, have contributed to Europe stretching its lead over Japanese suppliers, which have been stuck at 22% for several years. Large volumes of huge vacuum components like chambers are now being shipped each year, merged with near double-digit growth rates, favour the larger suppliers of vacuum subsystems. This shows the

momentum is with European suppliers as they have the resources to scale up rapidly and the funds to finance the research and development effort required to stay ahead of their customers' needs (Ross Young, 2021).

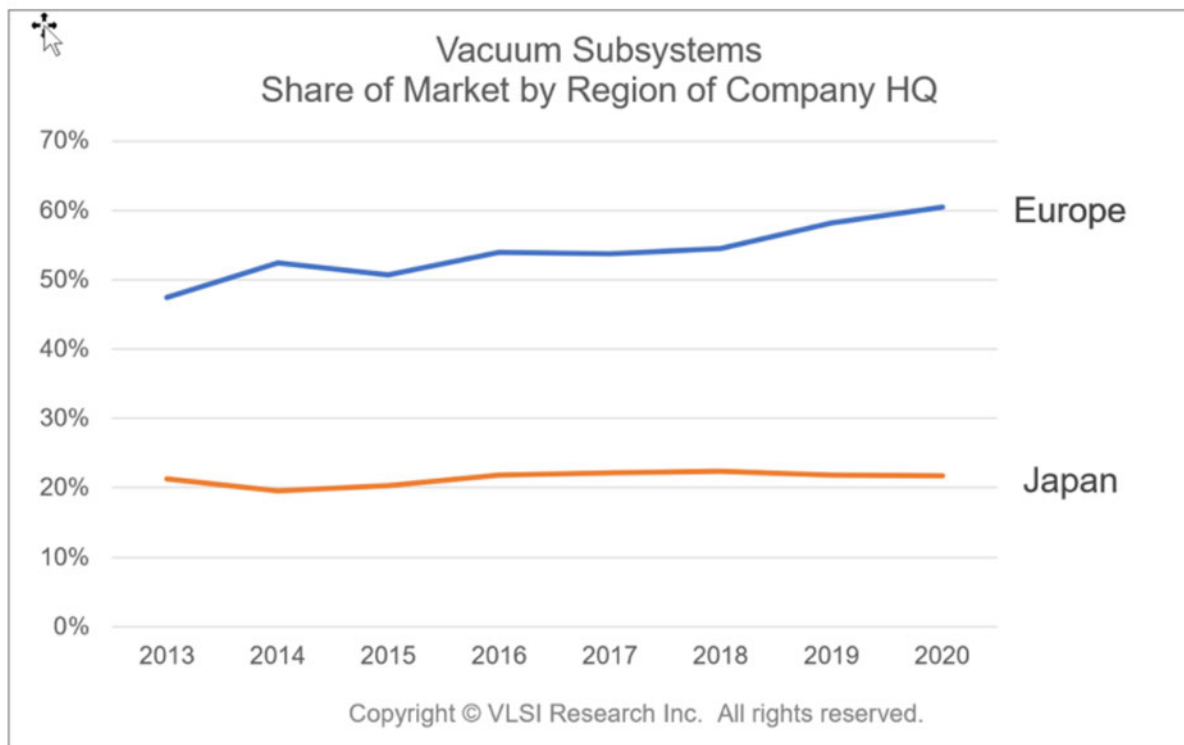


Figure 2 Share of market of vacuum Subsystems
Source: West (2021)

Europe and the DACH Region have a central role in mechanical engineering worldwide, which is only competed by Japan. In the new world order dominated by China / USA, Europe must defend at least its previously strong positions, with the support of a politically and economically strong Europe (West, 2019). Excellent and complementary solutions from the European machine industry is supporting this approach. However, successful companies in the DACH region are threatened: Young mechanical engineering competitors from the emerging Asian countries as well as large software players and internet platforms are pushing into the core business. The increasing "country first" tendencies of many countries, including China (Huimin et al., 2018), raise fears of the emergence of export barriers; moreover, new digital technologies and business models can become disruptive at any time and cause change - to name just a few of the possible threats. The COVID 19 pandemic has shown that seemingly unlikely threats must be taken seriously - and that they can change all thinking and acting almost overnight, and permanently. That expands the range of factors that must be taken into account when assessing future developments in the vacuum industry. Adopted from the Semi, Display and PV industry (Kong et al., 2016; Ross Young, 2021; West, 2019; West, 2021; Zhang & Gallagher, 2016), the following tasks should be addressed for the future:

Digitalisation of core processes

The future of the high-tech machining industry for vacuum components and equipment is both mechanical as well as digital; however, traditional know-how about digital skills must be expanded. One of the greatest dangers for the high-tech machining industry consists in remaining a purely mechanical company.

Resilience planning

Mechanical engineering in the vacuum industry has always been cyclical, but in the future the global uncertainties will become even bigger. This includes not only the economy, but various events that can influence the high-tech machining industry. Resilience is therefore an important property that every company should continue to work on.

Build partner network

In particular, machine digitalisation and modern service concepts cannot to be realized without an ecosystem of cooperating companies. There is no alternative to getting the right partners on board at the right time.

Define an Asia strategy

Asia is not only the largest sales market - Asia also contains some of the most dangerous as well as the most innovative competitors. As the high-tech machining industry will have to deal with this, it will have a significant influence on the companies' future.

Think globally

No matter which scenario prevails, the high-tech machining industry will remain globally aligned. Even extensive global tariff barriers will have no significant impact.

Build in sustainability

The idea of sustainability is triggered mainly in Europe and is most highly developed here. Therefore, it could be the primary guarantee of success factors for the high-tech machining industry in the DACH region: a "USP" (unique selling point).

Customer accessibility

Customers are the most important source of high-tech machining industry know-how and product development. A company that gives away direct customer contact completely to dealers and other intermediaries, relinquishes its most important asset.

Employee demand

The job market has changed - and machine builders need to step up their efforts to keep enough technicians and engineers in the future and find digitally-literate staff.

1.5. Localisation drivers for high tech industries

As stated by Kinkel and Maloca (2009), these are the main localisation drivers for high-tech industry companies:

- Cost drivers
- Resource drivers
- Entrepreneurial drivers

These drivers are mainly the starting point for the localisation processes. From a survey with 715 German companies, the following clustering was achieved: Main reasons for localisation were labour costs, market opening, capacity bottlenecks and proximity to customers. Taxes, subsidies and knowledge-getting had less influence in the localisation decision (Kinkel & Maloca, 2009).

One interesting observation is the activities of back shoring (resource the production/supply chain in the home country), and the justification for its adoption. In Kinkel's (2014) study, quality, flexibility and ability to supply were highlighted as key factors to relocate the supply chain. Further optimization concepts like component manufacturing in the home country were not well researched, the same goes for collaborations with contract manufacturers (Gylling et al., 2015). This should be taken into account when firms are not willing to invest in development of core competences for localisation purpose to protect their intellectual property.

1.5.1. Operative issues

A corporation may suffer significant financial losses as a result of supplier failures, issues with delivery or quality, reworks, or delays in the supply of goods. Boeing, Pfizer, and Cisco are a few examples of companies who suffered significant financial losses as a result of poorly managed supply networks in the early 2000s (Hult et al., 2010). In the main, a lack of competences by all stakeholders, including a defined interface description, led to a mismanaged situation. In response to these events, Hult et al. (2010) set out to investigate the core reason and issues of poorly managed supply chains and to delve more into the market uncertainties or inefficient decisions made as a result of a lack of demand or obvious visibility. Lack of management response to the supply chain, a lack of market change signals, and low supply chain scalability can all have detrimental effects on a company's performance and ability to deliver goods and services on time and within budget, which can harm its reputation (Hult et al., 2010; Mafini et al., 2018).

1.5.2. Specialisation and Globalisation

International businesses expand their presence globally to get access to markets, and they profit from local support initiatives by enforcing laws that eliminate customs taxes and reduce duties (Brandt & Morrow, 2017). As a side effect, in most cases companies make use of favourable infrastructure, including manpower capabilities (Chikán & Gelei, 2010). The extended footprint and increased use of supply, manufacturing and logistic partners result in complex relationships with an enlarged number of network nodes. These network nodes lead to higher complexity, where systematic approaches are needed to manage the network in an efficient way (Wadhwa et al., 2008). The leading industry for this complex setup is the automotive industry, from which some practices might be adapted to understand the influence of perceived supplier competences in localisation decisions. Hearnshaw and Wilson (2013) explained, through examples, that new approaches and models are needed to increase the productivity between all involved partners. For example, long pathlength between the nodes can cause inefficiency in information flow, which results in longer lead times.

Geographical concentration of specific network nodes or hubs has a higher risk of potential problems when an interruption occurs (Wadhwa et al., 2008). Those interruptions may paralyse the supply chain and further impact on financial losses and reputation (Wagner & Bode, 2008). As companies have not optimised their supply network with an increased number of suppliers worldwide and still less vertically consolidated them, Sawik (2011) highlighted in his paper that some regions are environmentally, politically or economically unstable. This leaves a supply chain setup more exposed to potential risks and can cause instability within the supply chain (Ruiz-Torres et al., 2013).

1.5.3. Product design and modularity

In today's industries, products are getting more extensive; different customers have different requirements, the number of product varieties is increasing and standardisation is a key variable to reduce the complexity of the setup of the supply chain (Kumar & Suresh, 2008; Nyaga et al., 2010). In addition, there is a push for quick new product creation in an environment of shorter product life cycles (Sun, 2013). Hameri and Hintsa (2009) explained that modular product design is one solution to overcome product management complexities in the future. As made known by Irani et al. (1997), companies involved in collaboration for new products and their modularity are keen to have early supplier involvement so that the design meets the cost targets. To choose, define and select the parameters and categories in close collaboration with their supply chain partners therefore increases their knowledge and awareness of the criteria. In the past, the automotive industry has shown successful supply chain setups with modularity in their car design (Brunnermeier & Martin, 1999), where some approaches might be adapted to understand the influence of perceived supplier competences in localisation decisions.

1.5.4. Intellectual property

DACH companies have recognized the risks of the Chinese market (Fredendall et al., 2016). Beside the potential profits and increasing opportunities, intellectual property rights are still violated today and are not being secured by the Chinese authorities (Zhao et al., 2006). Often foreign companies are forced to build joint ventures, where companies transfer their knowledge and expertise into China (Debellis & Pinelli, 2020; Sestu & Majocchi, 2020; Zhang et al., 2007). Parallel to this, Chinese companies are starting to do their own research and development based on technology transfer (Azadegan et al., 2013). Observing this from afar, such regulations are setting the entry barriers high, since knowhow is the most protected asset of a company, which has been observed in several R&D activities in China (Quan & Chesbrough, 2010). Narayanan and Fahey (2005) did an epistemological analysis of Porter's five forces framework, whereby the assumptions for the institutional level in theory confirmed to be not valid for emerging economies in the paper of Musole (2009). The variety of institutional circumstances needs to be evaluated further for each region and market, which will be examined in this study.

Zhao et al. (2006) argued that policies and the government support in China enforced protectionism against foreign companies who wanted to enter and expand their markets in China. The international adaption of product standards in China is still behind international standards (Hu & Lin, 2016). This explains why SMEs (small and medium sized enterprises) in particular are not keen to drive an aggressive development strategy within the market in emerging economies like China.

According to Lihong and Goffin (1999), if a successful market entry is made, challenges with quality, supplier management, and human resources management may arise because of social and cultural differences. Due to the established protectionism built up and not carefully selected right at the beginning of the setup, the missing core competences also seem to be another entry barrier. These important social factors, which influence perceptions of manager behaviour, will be investigated further to contribute to the framework of core competences.

1.5.5. Innovative manufacturing techniques

Supply networks often evolve, and new production techniques and technologies are adopted across a wide range of sectors. A few of these developments include outsourcing, just-in-time production, making-to-order concept, ship-and-merge (final assembly at end destination), and the development of innovative materials. Modern technologies like 3D printing, the Internet of Things, data analytics, and Industry 4.0 are being embraced by businesses (Almada-Lobo, 2016). For businesses looking to expand their reach and supply chain expertise abroad, the use of contemporary information technologies for monitoring and direction of such complex systems is a new contributing component (Mandal, 2016). To reach the level of sustainability with these new technologies, compared to the well-researched ones, is one of the key

challenges of today. Aside from the missing infrastructure and lack of digitalisation culture, Luthra and Mangla (2018) highlighted that the missing or new established digital competences are not well explored or seen by the management to drive activities further.

1.5.6. Institutional and regulatory policies

New requirements in integrity, corporate governance and annual reporting guidelines have changed over the last few years (Hameri & Hintsala, 2009). Such reporting includes major financial transactions and also well-hidden positions behind the numbers, whereas the due diligence process of a merger and acquisition is one of the topics where companies tend to combine know-how or capabilities to profit from each other (MacCarthy et al., 2016). Due to changes in their business and a different kind of manufacturing and supply chain setup, new opportunities are finally resulting in benefits for companies. It is therefore important to review and reflect on the potential or newly created hazards in the case of losing any remaining competence (Yuwei, 2007).

1.5.7. Impact of Risk Management in Operation and Supply Chain

The majority of the time, operational and supply chain risk management (SCRM) is used in conjunction with major catastrophes like the 2011 tsunami in Japan (Browning et al., 2023). Coleman (2006) noted a definite upward trend in these occurrences, which might instantly halt the supply chain with all associated drawbacks. No logistics, operations, or supply chain network is impervious to disturbances (Browning et al., 2023). The literature analysis's primary search terms are "Supply Chain Risk Management" and "Migration," whereas "supplier selection" is infrequently looked up in the study of Oliveira et al. (2017). To prevent supply chain disruption and maintain business contingency, it is essential to emphasize the importance of increasing transparency and knowledge in the field of SCRM along with supplier chain selection. Chen and Wu (2013), Ruiz-Torres et al. (2013) and Sawik (2011) seem to be the first authors to give importance to this field and to delve deeper into academic research and develop migration of SCRM as a core competence.

1.6. Research aim and objectives

There is still little empirical research on relocation to China, despite a few isolated but significant studies on topics related to relocation to China and back (off- and back-shoring) (for example, Ellram et al., 2013; Gerbl et al., 2016; Kinkel and Maloca, 2009; Mudambi, 2008; Pedroletti and Ciabuschi, 2023; Pongelli et al., 2019; Tse et al., 2020). To the best of the researcher's knowledge, no empirical study on relocation has thoroughly examined the impact of human variables. Furthermore, the supply chain and operations discipline of relocation lacks theory-driven empirical studies.

Pereira et al. (2019) claim that the majority of studies on the use of relocation have looked into the phenomenon and relocation processes (the “how”). There, however, remains a need to understand the effects of human behaviour, additionally, Pereira et al. (2019) highlight the requirement to create a conceptual framework for high technology capital equipment businesses beside that defined through the five important traditional decision making questions.

The research challenge is, therefore, formed by the necessity to create a relocation conceptual model that can be used in the user context, the lack of earlier literature that has looked at relocation phenomena for industrial products, and the history of the relocation of high-tech enterprises. This study will examine in the current practices for production and supply chain localisation with an emphasis on China for capital equipment, as mention earlier, most of the investments for semiconductor, display and solar industry are planned in China (Kong et al., 2016; Sun & Grimes, 2016; Zhang & Gallagher, 2016). This study will identify strategic relocation practises, structure and summarise existing core competence clusters. Furthermore, it will investigate how they are intentionally detected by the involved managers and discover how different concepts or models are introduced to their important stakeholders and affect their behaviour for relocation decisions. The following objectives of this study are in addition to the research questions:

- 1) To measure behavioural factors, derived from the existing literature, as to their potential effect on rationality in a localisation process and evaluate newly discovered implications of transforming capabilities into core competences.
- 2) To critically examine the influence of existing core competences on supply chain operation mode within a localisation process.
- 3) To develop good practice solutions with confirmed relationships in a localisation process.

It is not new to measure human factors in the context of supply chain management (SCM). Taylor and Todd (1995) are credited with launching a body of work that was later expanded by Yeung et al. (2003). Their combined study created knowledge and information about human aspects, such as views, attitudes, and behaviours, which helped provide a basis for this research. The current research, therefore, follows on a similar route and extends its focus to include the influence of core competences.

By investigating SCPRM practitioners' perspectives, attitudes, and behaviour about relocation efforts to China, the current study investigated human aspects. The claim is that organisations will struggle to retain their relocation if people have unfavourable views, attitudes, and behaviours. However, firms should be able to effectively maintain their relocation activities throughout time if people show good perspectives, attitudes, and behaviours during the planning period. Hence, to understand the "ingredients" that support an efficient and long-term relocation process, it is crucial to understand the human aspect (Mihalache & Mihalache, 2016).

1.7. Research significance

While there have been a number of significant studies on SCM-related topics (Petersen et al., 2005; Şen et al., 2008; Waters & Rinsler, 2010), there has not been much empirical study on how core competencies in SCPRM are developing in relocation processes in China. Additionally, the managers' attitude and behaviour play a significant role in the decision of which outsourcing operation mode to use (Hutzschenreuter et al., 2007; Lewin & Volberda, 2011; Maskell et al., 2007). Managers' cognitive models have an impact on how they perceive changes in their environment and how that perception influences certain strategic decisions (Bem, 1967; Festinger, 1962). Their capacity for action will be significantly impacted by these models (Ajzen, 1991; Ajzen & Fishbein, 1977, 2005). Since core competences in SCM are increasingly becoming a key issue in business management considerations, it is therefore useful to understand such development practices. This study's target is to contribute to knowledge in the area of SCM development practices by helping to identify, arrange, and describe the present development of key competences in SCM techniques in DACH & Chinese enterprises. Such information benefits the industry and may also be beneficial to government agencies and society at large. It provides managers and other people involved in supply chain relocation practices with more information on the tools, techniques, and approaches used to establish core competencies in supply chains and relocation management (Pedersen, 2013).

1.8. Research purpose and target groups

There has been significant research on SCM-related topics (Petersen et al., 2005; Şen et al., 2008; Waters & Rinsler, 2010), however there hasn't been much empirical study on how key SCM competencies are developing in relocation practises in China. Additionally, to the best of the researcher's knowledge, this research did not turn up any studies that examined the development of core competences related to relocation practises in China. Since core competences in SCM are increasingly becoming a key issue in business management considerations, it is therefore keen to understand such development practices. This study intends to contribute to knowledge in the area of SCM development practices.

Such information benefits the industry and may also be beneficial to government agencies and society at large. It provides managers and other individuals involved in supply chain relocation processes with more insights about the status, tools, and techniques currently being used to build core competencies in relocation activities (Pla-Barber et al., 2019). The industry might gain from the knowledge by outlining its own supply chains operations, analysing the scenario, and selecting management techniques that are consistent with a company's traits, instructions, and objectives. Other firm stakeholders, local communities, or particular organizations, including financial investors dealing with relocation vulnerabilities, may also be interested in the study (Pedersen, 2013).

1.9. Thesis structure

A study summary should sketch the approach, the focus tasks and the respective study chapters to provide a graphical study roadmap summary, as displayed at Figure 3:

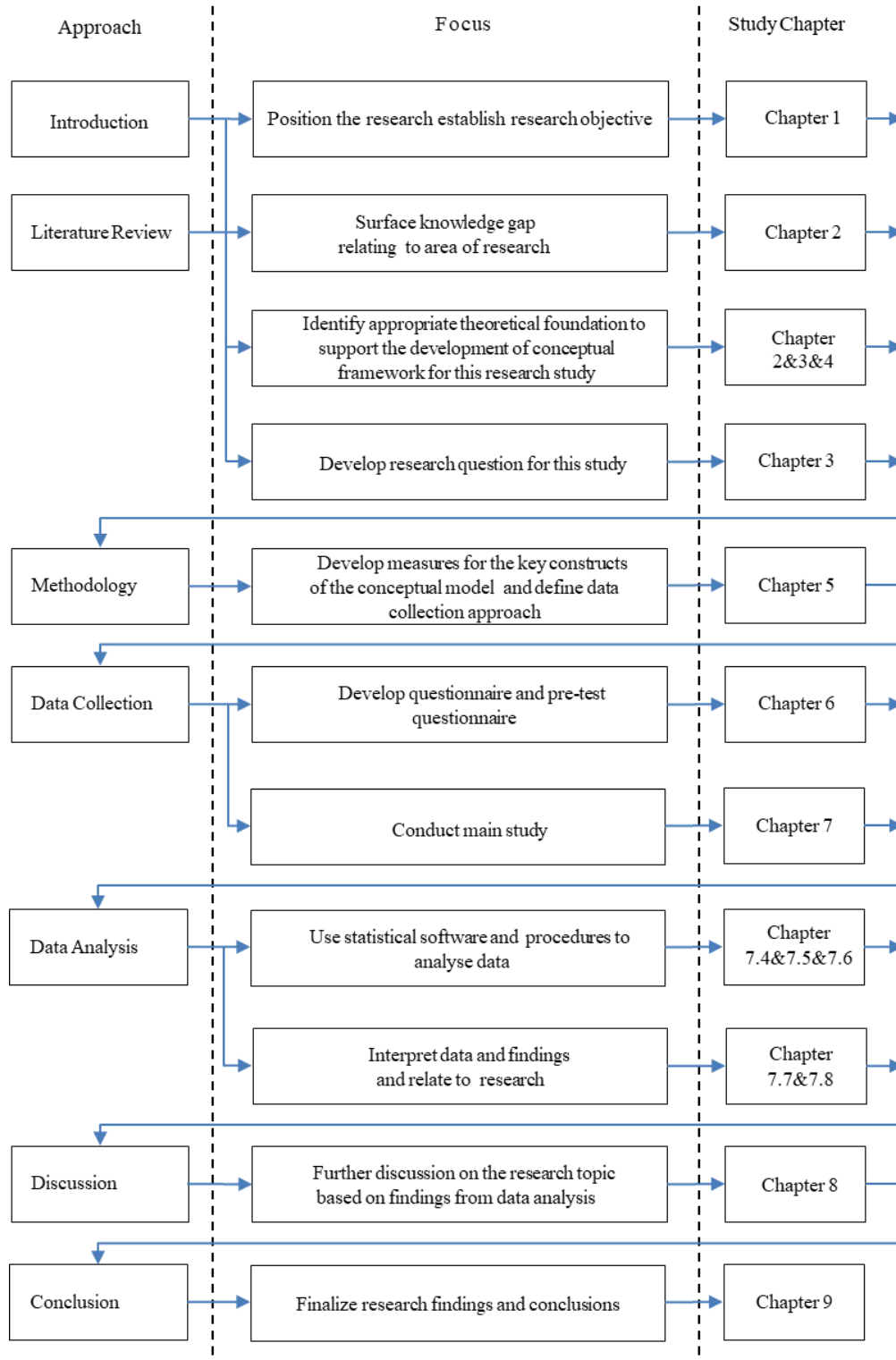


Figure 3 Chapter study summary
Source: adapted from Mackenzie and Knipe (2006)

1.10. Chapter conclusion

The introduction chapter's primary goal was to present the theoretical underpinnings, the rationale, aim and objectives for the research, and the goals guiding this empirical research. Additionally, it highlighted the main audience and the contributions to theory and the use of practical knowledge.

The SCPRM literature is reviewed in the chapter that follows. It includes the key organisational theories for supply chain models that are already in use, with corresponding inputs from research streams on critical core competencies.

2. Literature review

To clarify the approach used in developing this research, the literature review gives an outline of theories of behavioural science. Additionally, a summary of organisational theories for supply chain relocations, competence definitions, grouping and classifications of core competence are examined. This review begins by using the adaption of a systematic literature review from Derwik and Hellström (2017). This enables further contrasting of results from numerous research studies. This chapter concludes with the chapter summary, leading to the next section which provides technology acceptance theories and models development. Figure 4 provides a schematic summary of key parts discussed within the literature review.

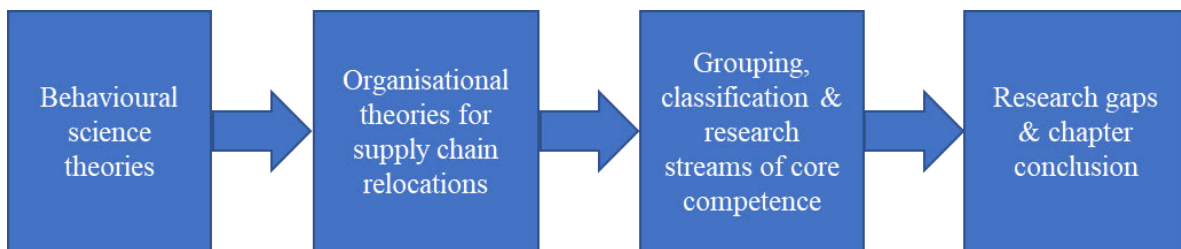


Figure 4 Schematic representation of key elements of literature review

2.1. Behavioural Science Theories

In the applied behavioural sciences, perspectives on knowledge growth and theory-building are partly established by using data already available and posing new questions or seeking solutions in a different manner from previous researchers (Pfeiffer & Ballew, 1991; Taherdoost, 2018). In this study, a theory - defined as "a set of explicit relevant assumptions, systematically tied to one another and to a set of empirical definitions" (Pfeiffer & Ballew, 1991, p. 10) - will be tested and validated. For this study, a number of statistical tests will be run on the hypotheses developed and the data gathered to confirm or change the predetermined theoretical assumptions.

According to Wacker (1998, p. 363) a theory consists of four elements:

- (1) definitions of terms or variables,
- (2) a domain where the theory applies,
- (3) a set of relationships of variables and
- (4) specific predictions based on factual claims (Bunge, 1967; Hunt, 1991; Reynolds, 1971).

In contrast to other acceptable and often used methods of constructing theories connected to inductive study, known as empirical sciences, this research uses the method of deductive inquiry used in the formal sciences (analytical, internally consistent, mathematical, and logical) (Saunders et al., 2009).

According to Glanz and Bishop (2010), there are two types of behaviour-related theories: explanatory theories and change theories. Behaviour is explained through explanatory theory. To create strategies for altering or influencing behaviour, change theory is applied. The primary priority will be given to analytically oriented theories because the focus of this research is to examine current production and supply chain localization techniques in the Chinese market (Touboulic & Walker, 2015). The explanatory method was chosen for another reason: investigations into behavioural changes typically take place over a long period of time. This would be a restriction given the small amount of time available for this investigation. Numerous journals that cover behaviour-based theories were evaluated in order to research theoretical models appropriate for this investigation.

The decision for relocation of production and supply chain is crucial (Kumar & Suresh, 2008; Stevenson, 1996). It is necessary to take into account that an SCRPM is planned, executed, implemented, organised, controlled, and maintained by human beings who are influenced by their behaviour (Teece et al., 1997). Usually, various roles fall to managers. With complex issues in the global market, limitations of managerial decision-making are caused by uncertain process, roles and responsibilities (Nielsen & Nielsen, 2011). Interpersonal roles that are largely social in nature, such as managing, organising, employing, instructing, inspiring, and motivating people, are among them, although they are not restricted to them (Javidan & Bowen, 2013). Behavioural techniques and processes are involved in interpersonal roles. The informative duties that are also performed include elements of information handling, such as transferring information both within and out of the company. Each of these functions includes behavioural processes because information is frequently transmitted not just between systems but also between individuals. The implementation of new strategies, dealing or resolving disputes between partners, distributing resources, and reaching agreements both inside and outside of organisations all depend on decision-making duties (Beechler & Javidan, 2007; Jiang et al., 2018). The importance of behavioural processes to each of these decision-making processes is clear from the literature. The majority of managers possess an effective mix of technical, social, conceptual, and diagnostic skills; the first two may be more significant for front-line managers, whereas the last two are often more significant for senior managers (Griffin & Moorhead, 2011).

Making decisions in a certain field is tough, but it becomes even more challenging when doing so in an environment where things are unpredictable (Golinska & Romano, 2012; Upadhyay et al., 2023). This only applies to exogenous uncertainty, as opposed to endogenous uncertainty, which refers to risks outside of the relocation, such as talent sourcing, legal and regulatory structure, financing agreements and tax implications, intellectual property and data privacy, concealed costs, variations in inflation rates and consumer price index fluctuations (Hult et al., 2010). Risks in the production process and the supply chain are examples of endogenous uncertainty (e.g. market and technology instability) (Trkman & McCormack, 2009). With a solid and proactive connection with the local internal setup or supplier, such hazards can be minimised (utilising techniques comparable to connection building, information exchange, and

collaborative audits) (Ritchie & Brindley, 2007). Exogenous unpredictability cannot be completely eliminated; however, it can be managed by making sure the strategies and supply chain structure are sound, as well as by identifying and analysing potential relocation sites, managing risks appropriately, keeping track of performance, boosting resilience and flexibility, launching proactive responses, and integrating the different supply chain tiers for SCPRM activities (McCormack et al., 2009; Trkman & McCormack, 2009).

Kahneman and Tversky (1973, p. 237) pointed out:

In making predictions and judgments under uncertainty, people do not appear to follow the calculus of chance or the statistical theory of prediction. Instead, they rely on a limited number of heuristics which sometimes yield reasonable judgments and sometimes lead to severe and systematic errors

Teng et al. (2011) noted (in the field of the business development of firms) that uncertainty is a natural component of human situations and also applies to business conditions. As a result, several important decisions must be based on assumptions about the possibility of such uncertain procedures. Intuitive judgments are frequently the only practical way for measuring uncertainty because suitable and simple conventional models may not be present for all situations, e.g., it is impossible to calculate the likelihood of every event (Gilovich, Griffin, & Kahneman, 2002). The evaluation of probabilities in the presence of uncertainty by professionals and laypeople has been the subject of research (for instance, a significant percentage of the research on decision-making in SCPRM is certainly dependent on behavioural judgements as well as mathematical factors, which are now mostly unmapped and require further study). The importance of managerial perceptions of relocation consequences for SCPRM has only recently been explored (Pla-Barber et al., 2019; Sodhi et al., 2012; Zsidisin, 2003). A small number of models are available to analyse relocation in the technology industry. Lewin and Volberda (2011) derived a basic framework from the international theory in combination with the transaction cost and the resource-based view, where activities, even high capabilities that are required, are grouped into “offshorability” actions. Furthermore, case studies are mostly used as the basis for descriptive and conceptual models in the literature rather than quantitative models (Klier et al., 2017). Therefore, there is a need to validate existing quantitative models with the latest observed relocation management concerns to make informed decisions in managing relocations for high tech equipment. The next sections provide an overview of the existing and applied theories for relocations.

2.2. Key organisational theories for supply chain relocations

To provide an understanding of the explanations and factors for relocation and its related terminology, this sub-chapter will provide an overview of the most important definitions and theories. There are many theories linked with relocation and its location decision. As the context of this thesis only allows a small analysis, the most important theories will be included

here. This enables at a later stage the examination of possible variation between the identified factors of relocation. Additionally, it will help to clarify the aspects and their significance in relation to the topic being discussed.

In the decision process of selecting a location, many factors are relevant. Academics have contributed to different research projects (Di Mauro et al., 2018; Kinkel & Maloca, 2009; Kontinen & Ojala, 2010) to analyse and understand what is relevant to consider when deciding where to locate a company. Before explaining the key theories for relocation, Farrell (2006) summarised general factors to be considered for relocation:

1. Costs decomposed into labour, infrastructure, real estate and corporate taxes
2. Ability of skills, skill pool and vendor landscape
3. Environment, support by government, business & living environment, accessibility
4. Market potential, attractiveness of the local market and markets nearby
5. Risk profile, including macroeconomic, regulatory and intellectual property rights
6. Quality of infrastructure, telecom and IT, transportation and reliability of power supply

The implication of this information for this research study is in understanding manager behaviour according to the choice of relocation mode in combination with the company's ownership. The objective is here to explain practical relocation phenomena, underlined with academic theory. This section will also consider a variety of important internationalisation and relocation (offshore) theories, many of which have a significant impact on relocation. Additionally, this chapter discusses the motivations behind various relocation patterns, contrasts their similarities and variations, and will aid in developing hypotheses to address the study topic.

2.2.1. Eclectic paradigm of international production

The theoretical basis for the analysis of multinationals' internationalisation efforts during the past three decades is provided by the eclectic paradigm and location advantages. The eclectic paradigm is the finest justification for a company's plans to expand internationally and is relevant in many parts of the world, according to Johanson and Vahlne (1990), who established it as a theoretical framework reference. It is predicated on the idea that egalitarian areas are where businesses strive to make internationalisation decisions since they are where a company's unique asset gains in producing goods for foreign markets, tendency to enter foreign markets, and appeal of foreign markets lie (Buckley & Ghauri, 2015). Furthermore, this theory manages to justify the extent, structure, and pattern of international production (Collinson et al., 2016). For example, multinational firms produce and operate in international markets in large part due to the draw of resources and opportunities, as well as the improved efficiency and strategic assets in the emerging market (Collinson et al., 2016). This eclectic paradigm presupposes that three forces govern global production, according to Dunning (2001, p. 716):

- (1) The (net) competitive advantages which firms of one nationality possess over those of another nationality in supplying any particular market or set of markets. These advantages may arise either from the firm's privileged ownership of, or access to, a set of income-generating assets, or from their ability to co-ordinate these assets with other assets across national boundaries in a way that benefits them relative to their competitors, or potential competitors.
- (2) The extent to which firms perceive it to be in their best interests to internalise the markets for the generation and/or the use of these assets; and by so doing add value to them.
- (3) The extent to which firms choose to locate these value-adding activities outside their national boundaries.

Dunning (2001) contend that corporate decision-making, ownership, and access to space all have an impact on global production. This model, according to Dunning (2001), provides a useful framework for examining the factors that influence global production. According to subsequent research by Stoian and Filippaios (2008), internalisation decisions should take ownership and location benefits into consideration. This finding supported Dunning's theory. The outcome demonstrates the usefulness of Dunning's Eclectic Paradigm (OLI) in examining global motives (Stoian & Filippaios, 2008), which will support this study to build the hypothesis out of the extracted motives for the group of MNL's.

2.2.2. Transaction cost theory (TCT)

In its closet definition, transaction costs have been defined as the costs of using price mechanisms (Musole, 2009). Transaction cost economics is assumed to encompass different modes of organising transactions (governance structures – such as markets, hybrids, firms, and bureaus) that reduce transaction costs (Williamson, 1979). Transaction cost theory (Williamson, 1979) suggests that the optimum organisational structure is one that reaches economic efficiency by decreasing the costs of exchange. Cost theories focus mainly on the productions process, and market transactions are supposed to be costless. In the ground-breaking research of Coase (1937), *The Nature of the Firm*, he starts with a an apparent reality: resource allocation in capitalist economies takes place not solely through autonomous market exchanges, but rather conjointly through entrepreneurial choices or organisational orders inside companies. According to Coase (1937), the market, hierarchy, and governance systems are primarily settled by transaction costs. To assess transaction costs, three parameters were developed: asset specialness, uncertainty, and transaction frequency (Williamson, 1977). A clear-cut definition of transaction cost does not exist, partly because these costs exist in different circumstances, and researchers approach them from different perspectives.

Furubotn and Richter (2005) classify various types of transaction cost into three groups, according to the contexts in which those costs are incurred:

1. Market transaction costs, defined as the costs of using the market. These arise primarily due to the need for information and bargaining processes that characterise the use of the market. They consist of: (a) the costs of preparing contracts (search and information costs); (b) the costs of concluding contracts (costs of bargaining and decision-making); and (c) the costs of monitoring and enforcing the contractual obligations (Furubotn & Richter, 2005, pp. 51-54).
2. Managerial transaction costs, which are the costs of organising activities within a firm. These include: (a) the costs of setting up, maintaining, or changing an organisational design; and (b) the costs of running an organisation (Furubotn & Richter, 2005, pp. 54-55).
3. Political transaction costs, which are associated with the costs of using political institutions. These are understood as: (a) the costs of setting up, maintaining, or changing a political system; and (b) the costs of running such a system (Furubotn & Richter, 2005, pp. 55-57).

The relocation discussion within the TCT covers a well-known area. The relevant literature refers to a situation which is conventionally well known in theory, and in practice as “make or buy” decision. But it is necessary to concentrate on the economic factors of relocation decisions in this process (Arnold, 2000). In this study, these factors are further derived to investigate managers’ relocation mode decisions.

Geyskens et al. (2006), state that transaction specific resources show that vertical integration may be used to address both an asset protection concern that arises during a transaction and aligned assets. A problem with adaptation, brought on by environmental unpredictability, will be resolved via hierarchy. Higher transaction frequency increases the likelihood of hierarchical governance. Which transaction between a corporation's (hierarchy) and a market is more efficient is the central query of TCT. Such dimensions might increase the transaction costs and lead to a dissatisfied market (Williamson, 1977). Which transaction between a company's internal hierarchy and external market is most efficient is the first TCT question (Geyskens et al., 2006). Moreover, which activity is a core competence, a key component of the company's competitive advantage, in respect to the various clusters of necessary core competence (Arnold, 2000)?

The current study concentrates on another hierarchy: relational governance (alliance), if market failure arises, even though the categories (market and hierarchy) originally support the TCT (Geyskens et al., 2006). The desire for collaboration and cooperation as the compromise solution of a transaction is supported by the current and expanded TCT (Kim et al., 2010).

Markets, long-term contracts, and hierarchies may all be used to group together the governance of transactions (Kjaer, 2010). The TCT “explains that inter-firm cooperation can overcome the limitations of restricted rationality, secure economic efficiency with reduced transaction costs,

and realise transaction stability from opportunistic threats” (Kim et al., 2010, p. 864). As indicated in Table 1 below, Kjaer (2010) established a comparison of the market, hierarchies, and networks in terms of governance. He said that hierarchies utilize power and markets incur expenses due to the mechanism of trade. In the case of relocation, it is important to understand their impact to the related stakeholder. This study's objective is to classify business relationships, dependencies, and cultures into three groups: market (licensing), network (supply chain collaboration), and hierarchy (independent subsidiary firms), according to how much managers' attitudes, behaviours, and actions are perceived to be influenced by these categories.

	Markets	Hierarchies	Networks
Basis of relationships	Contract and property rights	Employment relationship	Resources exchange
Degree of dependence	Independent	Dependent	Independent
Medium of exchange	Prices	Authority	Trust
Means of conflict resolution and coordination	Haggling and the courts	Rules and commands	Diplomacy
Culture	Competition	Subordination	Reciprocity

Table 1 Comparing market, hierarchies and network models of governance
Source: Kjaer (2010, p. 42)

Total costs, not just transaction costs, are prioritised in the context of greatest value supply chains as the foundation for traditional "make or purchase" decisions (Ireland & Webb, 2007). These immediate expenses become less important if the collaboration has the potential to develop into a long-term partnership and if there are strong interpersonal bonds. Transaction costs represent the main focus of "make or purchase" choices in traditional supply chains. Here, opportunism weakens confidence and places a priority on short-term expenses (Holcomb & Hitt, 2007; McCarter & Northcraft, 2007; Morgan et al., 2007).

In relation to the different cluster of required core competence, this study refers to the high-tech inductor for capital equipment, where a gap in the following questions exists:

1. Are the activities highly complex and specific?
2. Are the activities strategically important and major for a company's success?
3. Are the activities a core competency and a key component of the company's competitive advantage?

The perceived behaviour of managers in relation to these questions will be further investigated to understand the impacts of these factors to the selected relocation decision mode.

2.2.3. Resource-based view theory (RBV)

The resource-based view (RBV) idea is one of the fundamental tenets for a company's competitive advantages, according to contemporary research (Barney, 1991). In accordance with the RBV literature, a company is seen as a collection of various resources, production components, or groups of resources that include all the inputs required for a firm to manage and implement its strategy and tactics (Barney, 1991; Wernerfelt, 1984). In this flow, a company's resources serve as the analytical unit, and the RBV's focus is on the relationship between resources and performance (Bromiley & Rau, 2016). Utilising a company's resources is based on the idea that doing so will provide it a competitive edge (Wernerfelt, 1984). Resources that are precious and scarce may provide a firm a short-term competitive edge and boost its performance, but resources that are nonreplicable and non-substitutable may give a company long-term benefits that are not inheritable (Barney, 1991). For relocation practices it is important to understand the existing resources of companies, as well as which resources and competence can be allocated to gain competitive advantage, which will be examined in this research project.

RBV concentrates on internal resources and capabilities as a source of competitive advantage for a business (Dyer & Singh, 1998). Instead of the whole sector, the RBT focuses interest in the worth of a specific company (Panayides & Cullinane, 2002). Amit and Schoemaker (1993, p. 35) explain the choice of key elements thus: "Resources as a stock of accessible factors owned or controlled by the firm; and capabilities because the companies capability to deploy resources (tangible or intangible), together, victimisation organisational processes to result a desired end". Additionally, resources and skills differ greatly from one another since resources denote possession, but capabilities denote ability (Olavarrieta & Ellinger, 1997).

Major strategic contributions to the development of RBV in connection with supply chain and capabilities are listed in the following Table 2:

Author	Characteristic in the paper	Findings
(Barney, 1986, 1991)	Resource Valuable Rare Inimitable Non-substitute	RBV theory is a framework for the correlation between resources and sustainable competitive advantage. Short term – resources enhance performance. Long term – resources sustain competitive advantage.
(Prahalad & Hamel, 1990)	Core competence Static resources and the company's inimitable skills Technology Knowledge	Paper for practitioners: resources deployed. Focus on resource exploitation once others unnoticed at the time. Bundling – when resources are brought together, they will cause the shape of competencies and capabilities.

(Reed & Defillippi, 1990)	<p>Ambiguity in resources and skills</p> <p>Causal-ambiguity in competency-based advantage</p> <ul style="list-style-type: none"> - Tacitness - Complexity - Specificity 	<p>To investigate the link between causal ambiguity competencies and barriers to imitate, and so to develop theory that underpins the construct of sustainable competitive advantage.</p> <p>Competency: outlined as being the actual skills and resources a company possesses and superior approach during which they are used.</p> <p>Higher degree of tacitness, complexity, and specificity will create high degree of ambiguity.</p>
(Grant, 1991)	<p>Resource</p> <p>Tangible</p> <p>Intangible</p> <p>Personnel-based</p> <p>Capabilities</p>	<ul style="list-style-type: none"> - Financial capital, physical assets: factory/equipment - Reputation, brand value - Technical know-how, knowledge asset: organisational culture, employee training - companies' capability to assemble, integrate and deploy valuable resource, in combination.
(Amit & Schoemaker, 1993)	<p>See companies as bundle of resources and capabilities</p> <p>Resources – available factors owned or controlled by company</p> <p>Capabilities – companies' ability to install resources (tangible or intangible) to effect desired end</p>	<p>Resources, capabilities and strategy – concepts in RBV theory</p> <p>Capabilities - based on building, carrying, and exchanging information through the company's human capital.</p> <p>Capabilities - often created in functional areas (e.g., brand management in marketing) or by combining physical, human and technology</p>
(Teece et al., 1997)	Resources with dynamic capabilities	Companies' differences (resource with dynamic capabilities) lead to competitive advantage.
(Hunt, 2001)	<p>Tangible and Intangible</p> <p>Financial</p> <p>Physical</p> <p>Human</p> <p>Organisational</p> <p>Informational</p> <p>Relational</p>	<p>Companies' resources can be defined as tangible and intangible entities available to the firm that enable it to produce efficiently and effectively.</p> <ul style="list-style-type: none"> - Cash supplies, access to financial market - Factory equipment's, legal trademark, licenses - Skill and knowledge of individual employees - Competences, control, policies, culture - Knowledge from customer and competitive intelligence - Relationships with suppliers and customers.
(Hafeez et al., 2002)	<p>Resource as anything tangible or intangible owned or acquired by a company</p> <p>Capability as the skill to make use of resources to perform some task or activity</p>	Core competence development start with a capability analysis. Development of a framework for strategic decision making, competence development and identification of non-core capabilities for outsourcing.
(Newbert, 2007)	<p>Category of RBV tactics</p> <p>Resource heterogeneity tactics (HT)</p> <p>Organising tactics (OT)</p> <p>Conceptual-level tactics (CT)</p> <p>Dynamic capabilities tactics (DT)</p>	<p>HT – quantify the number of a given resource and capability possessed by a company – valuable, rare, inimitable and substitutable (Barney, 1991).</p> <p>OT – determine the interaction of an effective exploitation of the supplies and capabilities.</p>

		<p>CT – determine the attributes of resources and capabilities based on Barney (1991).</p> <p>DT – determine the interaction of selected resources and a specific dynamic capability.</p>
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Table 2 RBV Summary of strategic contributions identified in the RBV derived from Amit and Schoemaker (1993); Barney (1986, 1991); Grant (1991); Hafeez et al. (2002); Hunt (1991); Newbert (2007); Prahalad and Hamel (1990); Reed and Defillippi (1990); Teece et al. (1997)

As some studies in SCM touch the bases for commodity industries where a resource-based view highlights intangible resources and capabilities (Bromiley & Rau, 2016; Perunović et al., 2012), the resource-based view posits heterogeneous aspects of the perceived cognition for the managers involved in a relocation process. Such phenomena will be analysed to establish how different parameters influence the behaviour of managers’ decisions (Größler et al., 2013).

In the context to most excellent value supply chains, the idea is that unique assets, so called core competences, exist at the supply chain level and that supply chains are unique competitive instruments (Holcomb & Hitt, 2007). As shown in table 2, core competencies, capacities, and abilities were examined in the context of providing competitiveness. Traditional supply chains operate under the presumption that companies own unique assets. Consequently, supply chain management is a technique to support these resources (Miles & Snow, 2007). In this study the impact of the resources in combination with the perceived competences will be explored further, to understand their impact on the high-technology industry in China.

2.2.4. Agency theory

In order to protect against the likelihood of self-interest, competing interests, and irregular information flows between the principal (the person delegating power) and the agent, agency theory addresses the governance and management mechanisms of businesses (Lassar & Kerr, 1996; Panda & Leepsa, 2017). In this study the question of “make or buy”, including in case of outsourcing, involve a relationship between two parties. Due to observed partial goal setting conflicts, the key idea behind this theory is a principal-agent relationship which would reflect an efficient organisation of information and risk bearing cost (Eisenhardt, 1989; Panda & Leepsa, 2017). Contracts are in place as governance and management procedures, and incentives, (buffer-oriented and behaviour-based strategies), are used to ensure that the primary organisation meets minimal expectations. However, the delegation of work to another party imposes limitations on the agency theory (Eisenhardt, 1989; Lassar & Kerr, 1996).

Eisenhardt (1989) established a number of elements that affect the division of labour, including information systems, result uncertainty, risk aversion, goal conflict, programmability, and outcome measurement and relationship intervals. In order to solve problems in agency relationships, agency theory includes coordinating efforts (Liberatore & Luo, 2010) and monitoring methods (Hill & Jones, 1992). According to agency theory, humans are self-interested, rational, limited, and risk-averse (Roberts & Ng, 2011). Agency theory therefore assumes a blend of buffer contracts, result-based contracts, and behaviour-based motives.

According to Williamson (1977), social ambiguity and the traits of opportunism are compatible. In order to reduce risk, social ambiguity may be a selfish action taken by business owners or employees who directly or tacitly violate their mutually agreed-upon commitments (Miller, 1992). The influence and behaviour of the involved management in perceived core competencies for relocation will be analysed in this study, in the specific case derived from agency theory (Barclay, 2005), the impact when dealing with service providers and third-party companies, which in the case of traditional outsourcing (external relocation) plays an important role.

To reduce behavioural ambiguity, the SCM should have an effective and observable data flow (Tse et al., 2020). Sharing of knowledge between the integrator (tier 1 or tier 2) and part supplier (tier n) partners is a common method for resolving operational challenges, statement and market forecasting concerns, and other related issues (Stevenson, 2012). Improper data interchange might weaken the supply chain, which would essentially result in poorly coordinated supply chain operations (Waters & Rinsler, 2010). Poor supply chain synchronisation results in non-visible demand, which is the primary driver of demand multiplication and bull-whip effects (Lee et al., 1997). A collaborative technique to using control in reducing any changes within the governance of the current company plan is provided by supply chain risk management. This helps to establish a long-term strategic partnership with the supply chain affiliates (tier 1) and other tier n partners. The SCPRM techniques examined in this study were categorised as behavioural-based orientations. The scope of risk management techniques reduces the frequency of adverse occurrences in businesses (Kilubi, 2016). The perceived factors for SCPRM will be investigated in this study, to understand proactive and reactive behaviour of the involved individuals.

The greatest value supply chains limit the possibility of opportunism by using incentive systems and cultural competition to align the interests of both engaged partners' members. The interests of supply chain participants are only partially aligned according to classic supply chain theory, and this creates a significant opportunity for opportunism (Morgan et al., 2007). As mentioned, to understand managers strategic decisions on relocation, such factors have an influence on the perceived capabilities of the partner. Therefore, the strategic decision on operation modes will be investigated in this study, and what important parameter a “make or buy” decision has to understand its influence on the relocation decision (internal or external relocation operation).

2.2.5. Resource dependence theory

According to the resource dependence theory (RDT), businesses are not completely autonomous when it comes to strategically important resources and must rely on the resources supplied by others to continue existing and expanding (Pfeffer & Salancik, 2003). RDT has been used by institutional researchers to illustrate the external constraints that corporations face (Hillman et al., 2009). The main approach for the participant aspect is that a company's

stakeholders impact its behaviour, and the strength of this effect is determined by how dependent the organisation and its stakeholders are on resources (Clarkson, 1995).

Since Frooman (1999) published his work on institutional principles and the neutral influence approach, very little research has expanded on the meticulous approach of influence. The characterisation of resources that are leveraged throughout a technique of influence is a research gap that has not received enough attention. The different perceived cognition of the decisive influences of existing core competences on relocation decisions will be explored in this study.

Institutional scholars have recommended that social performers, like community groups or social movement organisations, are the conduits and tools of institutional burdens on companies (Lounsbury, 2001). On the other hand, small participants who do not control a company's vital resources have been addressed by RDT theorists as potential corporate influencers since they have institutional authority and a significant message (Lee, 2011). However, according to the mentioned research, there has not been much discussion in the literature about how minor participants acquire authority or how they might use authority to influence major corporations. Additionally, academics have not done a thorough enough job of mapping out all the mechanisms via which stress is applied to companies. Frooman (1999) designed the "use" and "withhold" strategies that stakeholders employ to influence the principal companies, but he neglected to address how stakeholders who have less reliance on the focal firm might win the favour of the cooperation's key stakeholders. Investigating the factors and procedures that affect stakeholders' behaviour in favour of low-carbon emission is thus required, since a sustainable and green environment are localisation driver for relocations (Lai et al., 2010; Saeed & Kersten, 2019).

In the context of greatest value supply chains, supply chain participants understand that dependency may foster patience and trust. The asymmetric interdependence that exists in these intercompany relationships during a relocation process is essential for certain companies to reduce environmental uncertainty. Participants of the supply chain who collaborate closely frequently grow more dependent on one another (Pfeffer & Salancik, 2003). Each participant in conventional supply chains attempts to avoid being unduly dependent on others to prevent being taken advantage of and tries to make others dependent on it (Waters & Rinsler, 2010). Moreover, having people rely on one's company might put one in a position of strength (Crook & Combs, 2007). Such competences enable a company's success, either with cost advantage or in differentiation of the product. The strategic decision to go for internal relocation enables more flexibility and control over the company but can cause higher initial costs and more time to set up such a local company in China. The impact on manager decision for relocation operation mode in a combination of competences outside the company and their established dependency are factors to be considered in this research.

2.2.6. Institutional theory

Established in the origins of economic research, Institutional theory has been appropriated by structural academics to discover organisational behaviours in supposed modern institutionalism (DiMaggio & Powell, 1983). This theory claims that in order to control how businesses behave, formal and informal institutions, such as rules and regulations, are both essential. Informal institutions include conventions, common views, cultural factors, etc. (DiMaggio & Powell, 1983). The main contention is that in order for businesses to be legitimate, they must achieve isomorphous uniformity (DiMaggio & Powell, 1983; Long, 2016; Suchman, 1995). According to Zimmerman and Zeitz (2002) legitimacy is a resource that organisations must have, just as capital and technology are. Research has attempted to evaluate the credibility of legitimacy's sources. Research has attempted to evaluate the credibility of its sources (Suchman, 1995). Scott (2013) divided legitimacy into three sources: regulative, normative, and cognitive. Regulations, norms, and standards developed by the government, accrediting organisations, and professional bodies serve as the foundation for regulatory legitimacy. Regulations, norms, and standards developed by the government, accrediting organisations, and professional bodies serve as the foundation for regulatory legitimacy. The values and norms of society, or a certain aspect of the social environment, serve as the foundation for normative legitimacy (Scott, 2013). Widely accepted ideas and presumptions represent cognitive legitimacy (Scott, 2013).

A number of researchers have applied institutional theory to the sustainability performance of businesses. Numerous issues have been discussed, including more government rules, cognitive transformation, and cultural shift (Chin & Liu, 2017). Zhu and Sarkis (2007) looked into the impact of institutional pressures on Chinese manufacturers' use of sustainable supply chain operations in environmental procurement exploration, arguing that strong, normative, and representational institutional pressures encourage corporations to become sustainable. To acquire sustainability, the perceived recognition of existing capabilities for managers has not been explicitly analysed or measured to test theoretical or practical implications in a relocation process.

Nevertheless, scholars have only just started to discuss and comprehend the institutionalisation process as well as how institutional forces are used to incorporate companies (Heugens & Lander, 2009). Understanding how this mechanism operates in groups of institutions is still a research need. Additionally, most examinations have selected the non-business sector as the most important setting (Do et al., 2022; Kauppi, 2013; Mafini et al., 2018), rather than the business sector, represented in this research by the high-tech industry in China.

In the framework of supply chain operations that maximise value, so-called industry best practises and recipes are utilised to inform rather than to guide SCM actions. The question at hand is how far a "formula" may be pushed to produce the best value in each particular industry. They are aware of the possible foolishness of imitation (DiMaggio & Powell, 1983). In the

perspective of traditional supply chains, the emphasis is that supply chains rely heavily on industry recipes and lessons learned to direct supply chain management activities within the company. Duplicating what works for supply chain stars like Wal-Mart and Federal Express is frequently seen as a wise method (Rogers et al., 2007). A deep assessment of existing capabilities for managers has not been explicitly outlined to test theoretical or practical implications in a relocation process, especially for the high technology sector. In this study, the strategic view of institutional regulations to decide with which relocation mode managers enter the Chinese market will be explored; for example, the entry mode depending on the size of the company. Furthermore, the aim is to understand the impact of institutional requirements on carbon footprint sustainability of local partners (Hofman et al., 2020).

2.2.7. Game theory

Game theory has recently revitalised as a relevant tool within the analysis of offer chains, particularly with multiple agents, wherein conflicting competition and cooperation occur in a supply chain (Raj et al., 2018). Game theory exactly deals with interactive optimisation challenges in a state in which the choices of various agents involve every other's payoff (Cachon & Netessine, 2006).

Game theory was formerly established as a mathematical approach by John von Neumann and Oskar Morgenstern within the 1940's (Poundstone & Neumann, 1992). Later it was adopted and used in social science and empirical exploration fields of study, notably to deal with human interactions wherever many parties were involved (Camerer, 2011). Thereafter, game theory also became known as interactive decision theory because it examines strategic decisions between interacting people (McCain, 2010). The main important established example of game theory is "Prisoner's Dilemma", which was validated by Merrill Flood and Melvin Dresher in 1950, and was named by W. Tucker (Poundstone & Neumann, 1992). It is a commendable conflict scenario showing that the foremost rational choices do not necessarily cause the simplest, best, most feasible outcome. Notwithstanding its relatively easy framework, the "Prisoner's Dilemma" has set a basis for analysing the interactions of multiple agents and crucially, to additional generating strategy alternatives for maximising one's payoff (Poundstone & Neumann, 1992).

In the view of supply chain management (SCM), that's embedded in the company method and contained of the transformation from raw materials to final product, game theory methodology will work as an efficient analysis tool to discover the challenges with reference to time, cost, risk (Papapanagiotou & Vlachos, 2012) and rivals' threat (Leng & Parlar, 2005). Typically, SC optimisation depends on the performance and improvement of SC structure and business by taking advantage of alternate sourcing, supply route management, collection warehouse positioning, and effective handling structure, whereby cost is the main performance metric (Zhang et al., 2014). Thus, it is necessary to explore the mechanisms and processes that

influence managers' behaviour towards sustainable supply chain optimisation to best cost country: what factors drive manager decision on relocation operation mode?

In the perspective of best value supply chain for game theory, so called mutual dependence and trust prevent members from engaging in self-serving behaviour (McCarter & Northcraft, 2007). A key aspect of game theory is attempting to anticipate the actions of others. Traditional chain participants in the supply chain have good cause to be wary of one another's intentions. Some members take advantage of free riding, hold up, and leaking for their own gain and the supply chains's disadvantage (McCarter & Northcraft, 2007). To keep the relation of both parties in balance, the correct perceived capabilities in the destination of relocation allow a company joint thrust and effectively create added value. from the perspective of a company strategy to enter China, this study investigates different strategic aspects that influence managers' decision on relocation modes in combination with trust build-up as an element of game theory.

2.2.8. Social network theory

Numerous sociologists have studied social networks to understand social behaviours and organisational practises. This field of study includes a wide range of inquiry and variation at entirely different levels. In their study, Borgatti and Li (2009) classified the connections between people in the literature on social networks (Figure 5). There are two main categories of ties: continuous and distinct. For the duration of the connection, continuous ties are those that are always present (such as familial relationships), whereas discrete ties are supported by a sequence of discrete occurrences.

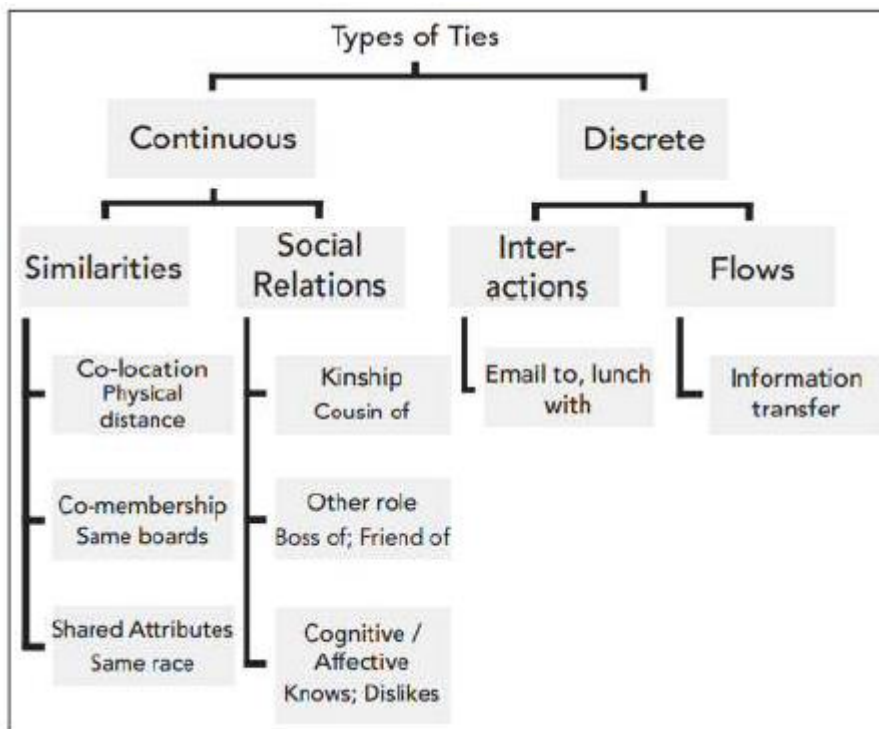


Figure 5 Typology of types of ties in social networks literature
Source: Borgatti and Li (2009)

The second level of typologies incorporates ties into four main groupings, as shown in Figure 5: similarities, social links, inter-actions, and flow. Similarities are described as "dyadic situations that may be similar to be 'prosocial' - things like co-membership in teams or co-location in space" (Borgatti & Li, 2009, p. 6). With the justification that people will trust one another as a result of social likeness and a shared life narrative, Kanter (2008) attempted to define "homosocial reproduction" in businesses. It can be difficult to determine whether a friend's behaviour is certain because of their shared status, religion, social class, place of employment, and history or because of information that has been exchanged over a long period of time among close friends. Another type of tie is social relationship, which studies groups of actors as well as the connections and differences among them (Newman, 2004). It is continually existing ties that are expected to produce cognitive affection, like trust. Continuous relationships are believed to promote cognitive attachment, such as trust. In contrast to social relationships, interactions are made up of isolated occurrences that may span a period of time, such as "talking with over the previous month" (Borgatti & Li, 2009). Information and knowledge streams and derived results of the perceived recognition of capabilities and their resulting behaviour outlays result from signalling individual aspects, thus enhancing trust within the environment. These clustering's of different competences will be explored in this study in the section on core competences in the literature review by enhancing an existing systematic review within the high technology core factors of competence (Derwik & Hellström, 2017).

The material that flows or shifts between actors once they engage makes up a tie called a stream; examples include ideas, cash, or stockpiles of goods (Borgatti & Li, 2009). Streams are often the most essential reasonable type of connection, in principle. However, in reality, streams are challenging to quantify. Instead, flows should be derived from social interactions or relationships. Cross-sectional knowledge was utilised by Borgatti and Cross (2003) to understand live data and information streams in social networks.

A mix of strong and weak ties that is appropriate for the demands of the supply chain is formed in the context of greatest value supply chains in order to maximise performance. Strong linkages represent closely related businesses, and loose ties involve those with more shaky connections, which is where the problems in supply chain are strategically positioned (McCarter & Northcraft, 2007).

In contrast, the formation of strong and weak linkages occurs haphazardly rather than purposefully in conventional supply chains. For instance, strong bonds are more dependable, whereas loose knots increase flexibility (Morgan et al., 2007). The capabilities of the interacting and involved individuals to gain knowledge and build trust is a phenome, whereby the theoretical and practical drivers need to be analysed and implemented in the proposed theoretical model in this study in the factor of perceived social competences of the responsible manager.

2.2.9. Social capital theory

Social capital theory (Carey & Lawson, 2011) focuses on the "softer aspect" of organisational activities. According to social capital theory, people make up the companies that make up supply chains, and those people's interpersonal abilities and connections (such as the "credits" and confidence they develop with one another), define supply chain activities and outcomes (Nahapiet & Ghoshal, 1998). In the works by Ireland and Webb (2007) and Krause et al. (2007), this model has a notable role. Each person in a typical supply chain has conflicting dependability toward the chain and the company (Carey & Lawson, 2011). Common company-level objectives, principles, and practices produce shared reasoning and limit performance (Krause et al., 2007). A great cost supply chain, on the other hand, creates a situation where shared goals, convictions, and experiences result in improved performance. To discover phenomena in combination with enhanced core competences, the understanding of roles in interpersonal relationships to reach the creation and upkeep of first-rate cost supply chains will be investigated. Furthermore, this study will investigate parameters and their influence in driving first-class value supply chains in shared cognitive processes, rather than the traditional supply chains that are considered in the theory and its hypothesis building, to extract and underpin the individual factors influencing managers' decision on relocation operations mode.

2.2.10. Strategic choice theory

Strategic choice theory takes the approach of enhancing contingency theory (Roh et al., 2017). The strategic choice model emphasises the value of making strategic decisions, whereas the contingency principle has a deterministic viewpoint that contextual circumstances such as environment, technology, or the scale of operation determine arrangement. Organisations can change and grow as a result of their interactions with their environments (Sadler & Barry, 1970). Moreover, companies must adapt their organisational structures to reflect environmental changes in order to achieve improved performance (Volberda et al., 2012). Because the notion of transforming organisational operations is far-reaching, the reputation of decision-makers about environmental unpredictability is a crucial consideration for businesses. This shows how decision-makers manage the relationship between companies and the environment, leading to the correct variance of businesses after environmental variation and excessive performance (Roh et al., 2017). Child (1997) emphasised that the idea of strategic desire is non-deterministic from this perspective.

Strategic decision-making is entirely based on Chandler's approach notion (Chandler, 1990). According to Chandler, organisations are no longer altered by a single element, such as the environment or strategy. When changing organisations, decision-makers should keep organisational and environmental perspectives in mind (Volberda et al., 2012). According to this perspective, strategic decision theory and contingency theory complement one another. Aside from that, Child (1972) questioned contingency theory from the perspective of

organisations and their environment. According to Child (1972), the relationship between the environment and establishments must be interactive if circumstances are to be altered and businesses are to be transformed as a result of the exchange. Businesses lose opportunities and risk becoming extinct if they do not deal in context-appropriate ways. To overcome this, businesses must use managers to link strategy and environment. In this regard, managers employ various techniques after realising the diversity of the environment, and as a result, they may experience unique performance (Volberda et al., 2012). Therefore, overall performance may be determined by managers' reputation of it is opposed to the environment itself.

Child (1972) conflated decision-makers' autonomy, control over their environment, and their role in the interaction between the environment and businesses. From this vantage point, strategic desire places more emphasis on appropriate performance than on good overall performance and on appropriate manipulation more than on unconditional adaptation to the environment. Additionally, decision-makers choose strategically after recognising the environment and how it affects performance.

For strategic desire, which is demonstrated as pre-action or re-action, Child (1997) emphasised a network of internal and external linkages. This underlines the value of actively participating management. By examining internal organisational characteristics and external environmental aspects that are associated with high performance, managers can recommend a good plan. This viewpoint may also be applied to the connection between operational success and supply chain collaboration. Based on their perception of the environment and an analysis of internal sources, managers may decide on the degree of supply chain collaboration, and as a consequence they may experience high performance as a result of the choice.

So-called strategic decisions are ones that are made with consideration for the chain as the main motivator, from the standpoint of best value supply chains for the strategic choice theory. This "strategic supply chain management" creates opportunities for uncommon, cross-company coordinated initiatives. In contrast, the company's interests are the main consideration in traditional supply chains when making strategic decisions. This strategy forces businesses to employ a general strategy like prospector or low-cost leader (Miles & Snow, 2007). Therefore, for high technology industries, the influence in manager's behaviour to adapt such strategies and understand the different cluster of core competences for this sector is the aim for research in this study, whereby the categories of the perceived core competences are derived and implemented in the theory and hypothesis building of this research project. The understanding of the impulse to relocation operations will further lead into the described process of modelbuilding for the independent variables.

2.2.11. Summary

Coase (1937) began the investigation of how businesses interact. The terms "market" and "hierarchy" were first used by Coase (1937), and subsequently, "degree of control" was used by Hymer (1968) to illustrate the interaction between corporations. Williamson (1977) presented the network as a middle form between the market and hierarchy based on their efforts. According to Williamson (1977), corporations would choose long-term contractual agreements like alliances rather than either a market like licencing or a hierarchy like vertical integration, depending on the degree of market and organisational operations. Due to the degree of control involved, this research divides business relationships into three categories: companies as market (licensing), network (supply chain collaboration) and hierarchy (independent subsidiary firms). It also provides an explanation of supply chain collaboration from the perspectives of the market and organisational operations activities for relocations.

But why are connections now so crucial to the internationalisation and relocation of a firm's supply chains? Building capacities in core competencies is particularly important since it is closely related to the two key difficulties that were addressed earlier: psychological distance and knowledge transfer. There has been some research conducted to establish if the distance issues between various markets may be solved through business network linkages. The results of Yan et al. (2020) article show that business network interactions can help SMEs reduce or "bridge" psychological distance and that the effort required to build new ties will rise as the mental distance rises. Additionally, a body of research has shown that networks allow businesses to access markets outside their own country (Ojala, 2009), even though it will take more time and effort to create network connections due to the distance (Kontinen & Ojala, 2010; Lu & Beamish, 2001). Aside from that, information is one of the most priceless assets that businesses own, even though it may also be acquired through networking to build core competencies. Experiential knowledge or tacit knowledge is essential to a company's internationalisation process, according to the relocation theories already mentioned. Through contacts with consumers or suppliers, businesses can obtain external information that they can utilise to widen and develop their present knowledge perspectives (Eriksson & Chetty, 2003; Turnbull et al., 1996). Additionally, Kogut (2000) suggests that an organisation's knowledge base can also be developed through indirect knowledge generation. The phrase "indirect knowledge" refers to information that is produced as a result of an organisation's partner's or partner partner's activities, and all of these coordinated partners combine to form an organisation's SC network relationships. Figure 6 below provides a review of the key hypotheses that led to the supply chain relocation theories.

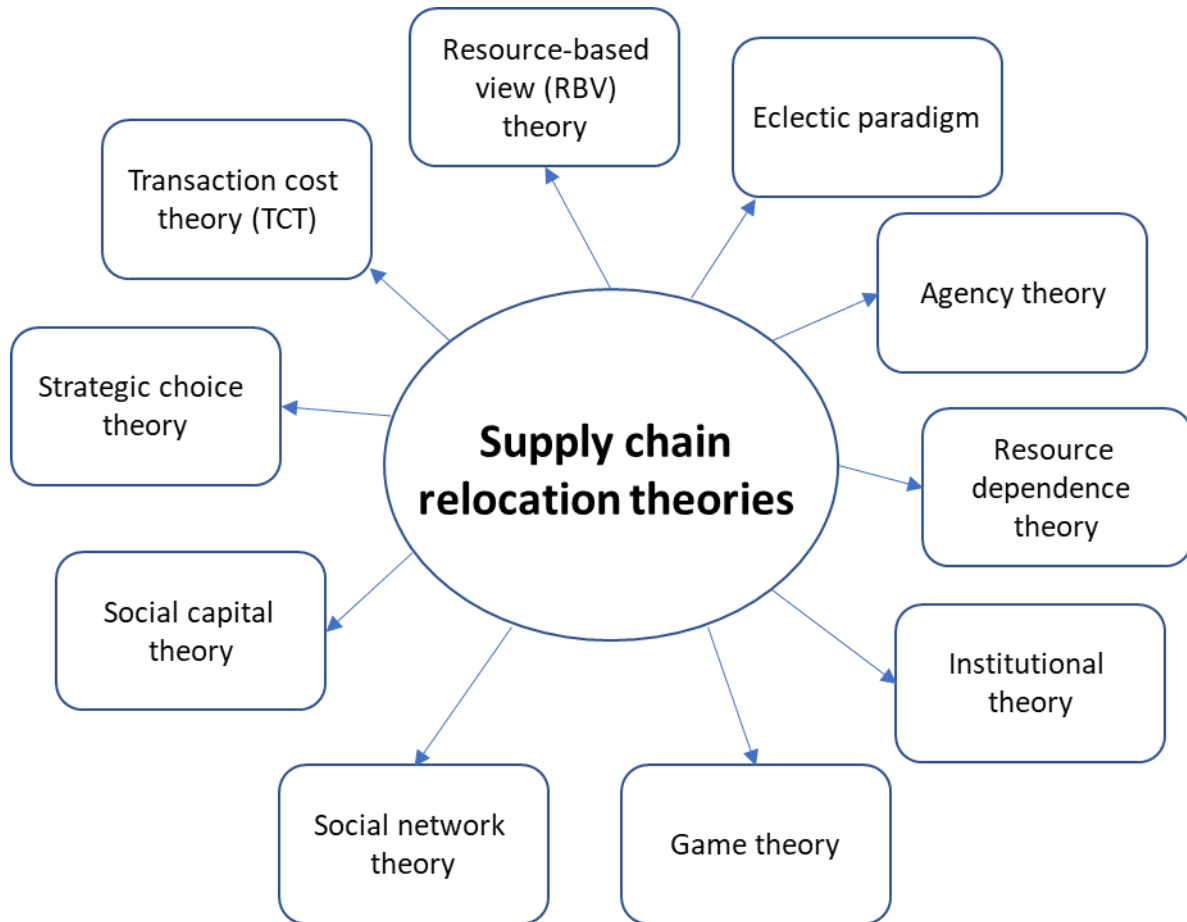


Figure 6 Overview of theoretical influences within supply chain relocation theories

The research previously mentioned into the various relocation theories looked at the problem of how to develop connections in an offshore business network throughout a company's internationalisation process. For instance, some managers develop their network of contacts and perceived capabilities by managing the activities of other companies, whereas other managers do so by creating interconnected procedures for several businesses. Despite the fact that these connections are formed primarily via social interchange, they may assist businesses in gathering information, developing trust, and finalising deals with more fidelity (Anderson & Weitz, 1992; Morgan & Hunt, 1994). Weak links and unilateral reliance will be increased, according to Hallén (1986), when a business pursues internationalisation, changing them into close connections and bilateral interdependence, and ultimately increasing the company's collaborative output (Zajac & Olsen, 1993). For high technology industries, the influence of manager's behaviour on adapting such strategies and understanding the different cluster of core competences for this sector is the research aim of this study. Each theory has had his own contribution for SCM theories of relocation practises. The connection to core competences in combination with precision engineering and manufacturing capabilities will be enhanced further in the theory and model building of this study.

2.3. Competence and capabilities

In the literature of supply chain management (SCM) there are several different interpretations for competences available; in some human resource management (HRM) literature, 'competence' characterises what companies can do, and competence is anticipated and transferred to an operational context. "Capabilities" characterise what kind of potential the company is able to have (Zhang et al., 2003). To include different perspectives on this definition, both relocation (offshoring) of SC and definitions of movement of SC back to the home country (back shoring) are considered. Analysed by Schmeisser (2013) and Stentoft et al. (2016) in a systematic literature review about relocation of manufacturing, most of the manufacturing literature references Teece et al. (1997) and Leonard-Barton (1992), as a result, the following definitions will be used for this study.

The definition of competence is when a company's unique assets are gathered in integrated clusters among individuals and groups to support the performance of a company's unique activities, which are organisational routines and procedures (Agha et al., 2012; Teece et al., 1997; Wang et al., 2019). The ability of the company to integrate, develop, and reorganise internal and external competences is the definition of capabilities (Teece, 2014). An organisation's capacity to develop cutting-edge systems of competitive advantage is reflected in the dynamics of its capabilities (Leonard-Barton, 1992; Teece, 2014, 2019). In this study the differentiation between capabilities and core competencies in combination with perceived manager's behaviour is an important difference to understand the phenomenon of relocation decision in China.

2.3.1. Core competence definition

As stated by Prahalad and Hamel (1990, p. 4) the definition of the core competence is the following: "Core competencies are the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies."

What is so called 'core' and what not is described in the following (Drejer & Sørensen, 2002, p. 390):

- the competence is practically inimitable
- the competence can contribute, across the board, to the sum of total of the corporation's product and market combinations
- the competence creates value for the corporation's customer

Prahalad and Hamel's research into competences was questioned by Drejer and Sørensen (2002) for taking a functional approach to a corporation's competitiveness. Drejer and Sørensen (2002) provide a concept of understanding that has two parts: first, awareness of how to achieve the practical foundations of a competence, and second, awareness of how to encourage the continuing growth of a competence that has already been acquired. According to Drejer and Sørensen (2002), this second section is an essential addition to Prahalad and Hamel's ideas. After careful investigation given to examine the core competence concept, Drejer and Riis (1999, p. 632) identified the four central components in a competence:

- 1) technology
- 2) employees
- 3) organisational structure
- 4) culture

The perception of these competences in the destination China by the manager and analysis of manager behaviours to decide of different relocation operations modes will be investigated and an attempt is made to minimize the risk of wrong decisions to successfully implement production relocations as the purpose of this study.

2.3.2. Core competence grouping and classification

By boosting statistical power through collaborative analysis, existing systematic reviews serve to support or clarify earlier findings on core competence. Derwik and Hellström (2017) conducted a systematic literature review of the core competences in the SCM and logistics. In their paper the following research streams are classified:

- Business results and outcomes
- Strategic management
- Process improvement orientation
- Logistics
- Education and training
- Organisational behaviour (human resource management)
- Relationships

The theories and existing models used have been developed for common industries or consumer goods (Di Mauro et al., 2018), but to the best knowledge of the researcher not yet established for high tech machinery for capital equipment in the semiconductor, display and solar industry. These key sectors are part of the “China 2025” program to enhance manufacturing capability development, research and development commitment, and human capital investment (Huimin et al., 2018). Derwik and Hellström (2017) established a systematic

literature review (SLR) for core competence in supply chain management. Derived from the research objective to be successful in business understanding, Mitchelmore and Rowley (2010) formed a SLR into entrepreneurial competences. By analysing the methods highlighted by both authors in the existing literature, the following group of different research streams are identified:

- strategic management,
- education and training
- organisational human resource management
- relationships

As a result, an additional literature review of academic research papers was undertaken. By using the keywords ‘Supply-chain Management’ and ‘Competences’ and filtering results based on the date of publication (between 2014 to 2019), forty-one peer reviewed journal articles were found. Out of the first search, twelve additional research papers have been added to the defined research streams, presented in Table 3:

Research stream	Publication references
Strategic management	Ambulkar et al. (2016), Armoutis et al. (2008), Berlak and Weber (2004), Chand et al. (2018), Chikán and Gelei (2010), Corsini et al. (2015), Drejer and Sørensen (2002), Feldmann and Olhager (2013), Jasemi et al. (2014), Kusaba et al. (2011), Lin et al. (2016), Lutz and Ritter (2009), Mandal (2016), Mani et al. (2018), Milosevic et al. (2009), Parry et al. (2010), Perunović et al. (2012). Schoenherr et al. (2014), Wang et al. (2008)
Education and training	Bernon and Mena (2013), Bölsche et al. (2013), Rojo et al. (2018), Sohal (2013), Stentoft Arlbjørn et al. (2006)
Human resource Management	Cvetić et al. (2017), Ding et al. (2012), Dubey and Gunasekaran (2015), Ellinger and Ellinger (2014), Halley et al. (2006), Harvey and Richey (2001), Huo et al. (2015), Kayakutlu and Büyüközkan (2010), Mangan and Christopher (2005), Myers et al. (2004), Prajogo and Sohal (2013), Richey et al. (2010), Richey and Wheeler (2005), Shou and Wang (2017), Spekman et al. (2002), Thai and Yeo (2015)
Relationships	Adams et al. (2014), Barnes and Liao (2012), Cox (2001), Ha et al. (2011), Halley et al. (2010), Kern et al. (2011), Kim and Wemmerlöv (2015), Liu et al. (2015), Okubena (2016), Paulraj et al. (2008), Stuart et al. (2012), Whipple et al. (2015), Usui et al. (2017), Zacharia et al. (2011)

Table 3 Research streams definition

Source: adapted from Derwik and Hellström (2017)

One intention of this study is to address the literature gap on SC manager competence by focusing on managing rather than management, not just looking at management and manager competence in person, but rather at what is happening in practice when managers manage, and how they observe competences they actually use. By using a practice theory method in a multiple case study, this research not only identifies competences that managers perceived in practice, but also provides an enhanced understanding of the nature of manager competences and explains the reason for the current use of competences and their influence on manager behaviour. Additionally, the research proposes enhancements to the theoretical approach by expanding an analytical framework model.

2.3.2.1. Strategic management

The papers shown in Table 4 focus on capability for higher-level decisions, such as strategic sourcing and the preservation of core skills and are a subset of the strategic management research stream. One example of this, but not the only one, is proficiency in broad processual arrangements, like lean and just-in-time, that support operations, agility, and relationships inside and between enterprises.

Core competence stream:	Author:	Descriptions:
Strategic Management	Ambulkar et al. (2016)	Development of a supply chain risk competency model based on the knowledge-based view at individual level. Highlights the relationship among supply chain manager's risk mitigation orientation, absorptive capacity and risk mitigation competency.
	Armoutis et al. (2008)	Quick and effective development of agile principles in designing and manufacturing of products. Transfer of these principles into the company's competences.
	Berlak and Weber (2004)	Cyber chain of a competence network for SMEs in development and manufacturing of prototypes. Realisation of a make to order environment and enhancing production flexibility. Alignment of stakeholder's expectation and firm competences to assure long term firm competitiveness.

	Chand et al. (2018)	Analyses the concept of supply chain complexity drivers and its dynamic behaviour by applying the qualitative situation-actors-process and learning-action-performance model.
	Chikán and Gelei (2010)	Develop and possess the ability to deliver value to customers. Companies must understand and specify the concrete customer value dimensions and also develop and maintain those competences that are necessary to create them.
	Corsini et al. (2015)	Explores the research dynamics of the e-waste literature. Established a map of the geographical time frames of research depicting the on-going reshaping of worldwide technical specialisations and the evolution of regional needs and competences.
	Drejer and Sørensen (2002)	Development of a top down / bottom up process to support sourcing decisions with analysis of the existing core competences, internal or external.
	Feldmann and Olhager (2013)	This research shows that site competences are grouped into three bundles related to three distinctive themes: production, supply chain, and development.
	Jasemi et al. (2014)	Cost comparison between short-term performances of a supplier managed inventory and a retailer managed inventory.
	Kusaba et al. (2011)	LCC (low cost country) sourcing competence of employees from purchasing and other involved functions. Understanding the key factors that define LCC sourcing competence and how they are associated with increased LCC sourcing performance. Supports a strong correlation between LCC

		sourcing competence and several LCCS-related performance measures.
	Lin et al. (2016)	Builds up a learning business system across its supply chain network to develop sustained competitive advantage. Creating a learning business system that develops and maintains deeply embedded competences through establishing mechanisms for both collaboration and competition across its value chain.
	Lutz and Ritter (2009)	Emphasises improving the supply chain and the interconnectedness of the firm's strengths. Shows that a competence-based view on outsourcing decisions is a valuable addition to cost-based perspectives.
	Mandal (2016)	Examines the impact of supply and demand expertise on supply chain innovation and its impact on the operational and interpersonal performance of an organisation.
	Mani et al. (2018)	Explores the social issues pertinent to suppliers and identifies measures and dimensions related to social sustainability in emerging economies.
	Milosevic et al. (2009)	Using a programme management competency model. Customers and their markets, business and financials, processes, project management and leadership are the areas in which the program manager should gain proficiencies to help the organisation achieve better business results.
	Parry et al. (2010)	Develops a methodology for lean implementation that reduces the risk of damaging a company's key resources and abilities through the application of core competence theory. Through pragmatic integration of theories from organisational

		competence and lean domains a methodology for ‘lean implementation’ consisting of four tasks: a market analysis, making the value stream visible, customer value analysis and financial modelling. This provides an integrating framework relating resource bundles to lean principles.
	Perunović et al. (2012)	Investigates how information technology (IT) utilisation contributes to success in outsourcing. The impact of IT on the fulfilment of supplier objectives in outsourcing is explored by considering the mediating effect of competences and capabilities.
	Schoenherr et al. (2014)	Observes how intangible capital and knowledge support the development of new product development competence within the context of a supply chain.
	Wang et al. (2008)	Explores and formulates a model that supports enterprises with their management of the supply chain members’ knowledge resource sharing. This method intends to support the advanced practice sharing, application, and augmentation not only for the functional fields within a certain organisation, but also among the supply chain members.

Table 4 Research stream strategic management

Competencies related to the strategic research stream have the following impact on SCPRM: “understanding of knowledge resources, and mainly the strategic function to establish market analysis, making value streams visible, customer value analysis and financial modelling of the company”. Additionally different approaches in sourcing between LCC and BCC discussed in terms of required core competencies (Kusaba et al., 2011). To explore and understand the implication to manager’s behaviours for high technologies industries, this is not explicit analysed, which is one aim of this study. The link between the perceived competencies and managers decision on relocation will be investigated to determine the importance of the research stream “strategic management”.

2.3.2.2. Education and training

The research stream education and training includes publications on competence development in academia and industry, as illustrated in.

Core competence stream:	Author:	Descriptions:
Education & training	Bernon and Mena (2013)	Explores the evolving nature of supply chain management customised executive education over the past decade. Contributes to the extant literature by bridging the gap in exploring the evolving nature of executive education programmes.
	Bölsche et al. (2013)	Elaborates practical approaches to how skills and competencies can be enhanced and developed for international education programmes.
	Rojo et al. (2018)	Analyses the relationship between environmental dynamism and supply chain flexibility. Organisational learning and absorptive capacity are the necessary competences.
	Sohal (2013)	Describes collaboration between businesses, universities and industry associations in Australia with the aim of developing an appropriate set of competencies for supply chain professionals.
	Stentoft Arlbjørn et al. (2006)	Reports on the experiences from a number of two-day courses in fundamentals of supply chain management in order to increase the organisation's competency level. Establishes a common platform making the changes a reality.

Table 5 Research stream education and training

Competencies related to the education and training stream have the following impact on SCPRM: “understanding of knowledge resources, elaborates practical approaches how competencies can be enhanced with international education programs, describes collaboration models between businesses and universities and establish common platform models for

organisation competency level” (Derwik & Hellström, 2017, p. 202). To explore and understand the implications of managers’ behaviours for high technologies industries, this has not previously been explicitly analysed, which is one aim of this study. The relationship between perceived competencies and managers’ decision on relocation will be investigated to determine the importance of the research stream “education and training”.

2.3.2.3. Human resources management

This research stream focuses on organisational learning, employee competence profiles, and general human resource management, as shown in Table 6.

Core competence stream:	Author:	Descriptions:
Human resource management	Cvetić et al. (2017)	Conducted a study of online advertisements of logistics and SCM jobs in Serbia. Some similarities between earlier empirical studies conducted in the USA, the United Kingdom and Germany are found.
	Ding et al. (2012)	Investigates the relationships between Chinese logistics service providers' operating practices and their expertise in logistics and the supply chain.
	Dubey and Gunasekaran (2015)	Builds a supply chain talent framework to enhance supply chain knowledge. Building supply chain competencies and required skills based on knowledge-skill theory.
	Ellinger and Ellinger (2014)	By utilising the skills of human resource development specialists, businesses establish and sustain competitive advantage.
	Halley et al. (2006)	Investigates on impacts of various types of buyer-supplier relationships on competency development.
	Harvey and Richey (2001)	A competency-based theoretical perspective is used, and eight classifications of intelligences are examined in the selection of global supply chain managers.

	Huo et al. (2015)	Combines the concepts from human resource management (HRM) and supply chain management (SCM) fields and explore the effects of high-involvement HRM practices on supply chain integration (SCI).
	Kayakutlu and Büyüközkan (2010)	Addresses the strategic importance of competence values in supply chain effectiveness.
	Mangan and Christopher (2005)	Explores the challenges for management development that arise as organisations seek to bridge the gap between current capabilities and those required for future success.
	Myers et al. (2004)	Definition of crucial issues of developing human capital, specifically developing valuable logistics managers. What can firms do to help build competencies in the form of logistics manager human capital?
	Prajogo and Sohal (2013)	Competencies and skills of supply chain managers, their use of supply chain technologies and future challenges in supply chain management. Communication and teamwork are identified as the most important competencies.
	Richey et al. (2010)	“G” score (i.e. intelligence) tests are not enough to assess and select the appropriate candidates for global supply chain management jobs.
	Richey and Wheeler (2005)	Multiple-selection model for selecting supply chain managers. Supply chain managers need all three competencies to perform based on the perspectives of relationship marketing, relational contracting, networking, and communications.
	Shou and Wang (2017)	Understanding the dimensionality of supply chain manager competences. Five dimensions of supply chain

	Spekman et al. (2002)	manager competences are identified: generic skills, functional skills, supply chain management (SCM) qualifications and leadership, SCM expertise, and industry-specific and senior management skills.
	Thai and Yeo (2015)	Development of a concept of supply chain competences and use learning as a proxy. Shared decision making & win-win orientation, dilemma of cooperation versus competition. Validates a new framework of competencies for container shipping logistics professionals.

Table 6 Research stream human resource management

Competencies related to the human resources management stream have the following impact on SCPRM: “Creation of a talent framework to enhance SC knowledge based on the knowledge-skill theory, understanding of crucial human resources issues of developing human capital, derived from future SC technologies, understanding and definition of capabilities to overcome future challenges in supply chain, describes collaboration models between businesses and universities and establish common understanding of the dimensionality of supply chain manager competences”. To explore and understand the implication to manager’s behaviours for high technologies industries, this is not explicit analysed, which is one aim of this study. The link between these sensed competencies and managers decision on relocation will be investigated to determine the importance of the research stream “human resource management”.

2.3.2.4. Relationships

The papers in the relationship research stream, which are included in Table 7, focus on the nature of connections between participants from different departments and organisations as well as cooperative skills.

Core competence stream:	Author:	Descriptions:
Relationships	Adams et al. (2014)	Tests a model considering relationships between collaboration, integration, and interfirm coordination technologies, and their associated performance outcomes.

	Barnes and Liao (2012)	By experimentally examining the impact of human, organisational, and inter-organisational competences on successful supply chain management, this study adds to the body of knowledge on competencies inside a corporation.
	Cox (2001)	Understanding the exchange relationship between supplier and buyer.
	Ha et al. (2011)	Measures trust between buyer and supplier. Collaboration in decision-making and benefit & risk sharing is impacted by SCM competence.
	Halley et al. (2010)	How the ideas of the resource-based approach and knowledge management fit together is shown in an integrated picture of SCM networks.
	Kern et al. (2011)	Development of a hierarchy-specific purchasing competence management framework for chief purchasing officers and further linking to purchasing performance.
	Kim and Wemmerlöv (2015)	Findings support the notion that the supplier's operational competences increase existing customers' dependence on the supplier's products or services.
	Liu et al. (2015)	Examines the impact of three power sources – non-mediated, coercive-mediated and reward-mediated power – on the three dimensions of trust – competence, goodwill and contractual – and their influence in turn on a firm's electronic supply chain management adoption in China.
	Okubena (2016)	Explores the circumstances and implications surrounding procurement issues with emphasis on accountability and transparency within municipalities in South-Africa.

	Paulraj et al. (2008)	Compelling case for viewing interorganisational communication as a critically important relational competency that can be leveraged for mutual gains within collaborative buyer–supplier relationships.
	Stuart et al. (2012)	Competency of the supplier was shown, and the causes and effects on performance of interorganisational communication were extensively explored.
	Whipple et al. (2015)	Increased levels of relationship management skills are necessary for enhancing supplier integration, which increase the level of social capital.
	Usui et al. (2017)	Examines a case study (Uniqlo’s) after their successful supply chain development in China. Using longitudinal contextual data to establish guidance for newly internationalising ventures aiming to build a global supply chain network from green field.
	Zacharia et al. (2011)	Investigates the capabilities that enable successful episodic collaboration in a supply chain context. Absorptive capacity (AC) and collaborative process competence (CPC).

Table 7 Research stream relationships

Competencies related to the human resources management stream have the following impact on SCPRM: “Understanding of the driver for exchange relationship between supplier and buyer, analysing of models considering relationships between collaboration, integration, and interfirm coordination technologies, understanding and measure the level of social capital, measure and building of thrust in the supplier – buyer relation” (Derwik & Hellström, 2017, p. 202). To explore and understand the implication to manager’s behaviours for high technologies industries has not previously been explicitly analysed, which is one aim of this study. The relationship between perceived competencies and managers’ decision on relocation will be investigated to determine the importance of the research stream “relationships”.

Table 2 to table 5 provide an overview of the existing research conducted in the past fifteen years. For some industries and different cultural regions, some competence models are already established, which is more in the field of business to consumer (B2C), but for the high-tech industry (business to business B2B), to the best knowledge of the researcher less is so far available, besides some case studies of some specific cases in the high technology industry.

2.3.3. Methodologies used for core competencies

An interesting result is the analysis of methodologies used in the journals. Similar than in the paper of Derwik and Hellström (2017), a clustering of the following groupings of qualitative, quantitative, conceptual and multimethod methods has been conducted, as displayed in Figure 7.

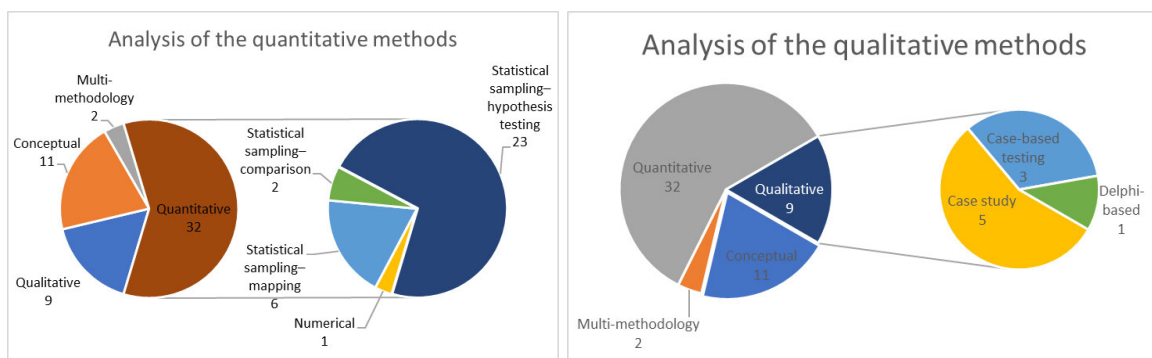


Figure 7 Quantitative methods & qualitative methods

The study shows that there are several different methodological techniques used in competency literature in supply chains. This selection shows careful consideration and attention to the study's subject. The unequal distribution of publications among the applied methodologies, however, raises the possibility of a limited perspective on the phenomena under investigation. Many academics (Golicic & Davis, 2012; Mangan et al., 2004; Näslund, 2002) have critiqued this as being in keeping with the restricted methodology emphasis because it focuses primarily on supply chain logistics research.

A large proportion of existing research papers use quantitative methods (approx. 60%). The statistical sampling approach, which employs surveys (primary data) and databases (secondary data) but with slightly distinct goals, is the most common of these. Their aim is to map and quantify the value of various abilities, compare the relationship between several variables, including flexibility, customer support, and financial success to various levels of operational competence. Testing hypothesis models also makes use of statistical sampling. These models consider elements like organisational performance, integration, and operational procedures.

This study intends to stay with the statistical sampling-hypothesis testing. The quantitative approach requires a large range of data to achieve the goal of some general findings for the high-tech industry.

2.3.4. Elements, dimensions & level of core competences

In the late 1990s, traditional supply chain competences were defined according to their function in companies within the context of operational, behavioural and planning & control activities (Bowersox et al., 2000). Due to higher globalisation and outsourcing activities, some researchers investigated other influences, which has mostly occurred in the last two decades (Samuel & Spalanzani, 2009). Differentiation like competence in general management, functional or technical competence and finally the competence to understand and deal with different cultures are investigated more and grouped as well in these categories (Sangari & Razmi, 2015).

Other researchers, including Zacharia et al. (2011) and Tokman et al. (2011), used a two-dimensional approach to their supply chain study, focusing on the operational and relational aspects of outcomes. They looked in the first dimension to the elements of core competence, and in the second dimension at the level of the involved individuals or stakeholders, so called internal, intra-organisational and inter-organisational. Since in the present literature these levels are not defined consistently, this study uses the definition of Derwik and Hellström (2017, p. 206):

- individual level: considers competences related to individuals
- intra-organizational level: relates to competences in and between different functions of an organisation
- inter-organisational level: relates to competence between organisations

An expanded version of the four aspects of competence was developed by Derwik and Hellström (2017). These were thought to be sufficient to cover the vast range of competencies acquired from the literature. Furthermore, he argues in his study article that a mix of factors rather than a single factor defines competency in supply chain management. Encouraged by the research above, this study adapts the approach from Derwik and Hellström (2017) by enhancing it with technical competence, since the study investigates companies in the high technology industry (Kong et al., 2016). Staying with this approach, the following adaptations to the groups of the elements are defined:

Functional & technical competence:

This competence engages directly with the existing job descriptions or functions in the company and within companies' process model, such as sourcing, manufacturing, and logistics. This competence will be divided into operational and strategic levels.

Interpersonal & social competence:

Deals with all parties, including staff, partners, managers, customers, and external departments, using interpersonal and social skills.

Management & behaviour competence:

Defines the competences for general management agendas like strategic management, finance (budget, resources and cost), change management and the further strategy of the SCM in the company. Furthermore, developing an innovative and inspired culture within all stakeholders

Interaction and overlapping between different levels of individuals, as well as between SMEs and MNEs, suppliers and buyers (Chiadamrong & Suppakitjarak, 2008), are the target groups of this research. Given the results of Croom et al. 's (2000) critical assessment of the SCM literature, which revealed that there are some tenuous connections between competence at the individual, organisational, and supply chain levels, Table 8 illustrates the second dimension. This study intends to take a wider look not only at the individual level, but also delve deeper into the intra-organisational (stakeholder within the firm) and inter-organisational (external stakeholder).

Element of competence	Individual	Intra-organizational	Inter-organizational
Functional & technical	operations procedures sales and operations planning (S&OP) procedures technique and technology knowledge company and industry experience	supply & production management product development management supply chain alignment management	business capability IT connectivity and compatibility
Interpersonal & social	communication teamwork cultural and cross-functional awareness	relationship management relationship integration	interactive capital organisational capital intellectual capital
Management & behaviour	business analysis & business management people management self-management & Self-motivation empathy & Creativity leadership cognitive skills	business strategy & intelligence resource management business execution change and learning orientation collaborative orientation	information management business management cultural orientation

Table 8 Elements of competence
Source: adapted from Derwik and Hellström (2017)

2.3.5. Summary of competence and capabilities

Competence elements in supply chain management

The analysis points out that while behavioural competencies and their impact on management behaviours have received less attention, functional competences have been the subject of comprehensive research. When examining publications that only address one or two areas of competence, the functional element's predominance becomes even more clear.

Levels of competence

A company's attractiveness is “tied to enhancing its human capital through the development of the competencies of its employees and by creating unique, distinctive and difficult to imitate core competences”, claimed Barnes and Liao (2012, p. 898). Therefore, it's crucial to transmit people skills from the individual to the intra- and inter-organisational levels. The perception of the manager to observe such processes and derive strategic decisions out of them is rarely studied for the high technology industry.

Development of competence in supply chain management

The real development of core competencies is another subject that merits inquiry, just as the sector with new technology evolves and requires updated sets of core competencies. According to Bernon and Mena (2013, p. 440), obtaining assistance for "wider strategy implementation and change management programmes within organisations" has given way to finding technical competency-based training for supply chain specialists. The main causes of this conversion have resulted in a current mismatch between the competencies already present and those needed by supply chain experts (Bernon & Mena, 2013), necessitating the advancement and expansion of the syllabus (Van Hoek & Wagner, 2013) as well as the investigation of the connections between executive education and academic institutions' clients (Bernon & Mena, 2013). Gibson et al. (2016) looked at ways to speed up supply chain management learning in environments that included both academia and industry, but there is more work to be done. Although significant research has been done on the development of supply chain management skills at the individual level, the development of these skills at the organisational level has received comparatively less attention.

2.4. Research gaps and chapter conclusion

The improper configuration in the relocation operating mode can have significant detrimental effects on businesses, their stakeholders, society, and the environment, as shown in the literature. Supply chain vulnerability has risen as a result of recent trends. A few examples of the variables causing this phenomenon are globalisation, best-cost sourcing, lean manufacturing to decrease stock level, outsourcing, specialisation, quicker time to market, and shorter product lifecycles. SCPRM is becoming more and more important, and professionals and academics are implementing standards, frameworks, and methods to guarantee company stability. Today, managing relocation involves more than simply making sure that products and services arrive at the correct location in the correct time with the proper quality and quantity. It also involves managing the appropriate steps necessary to carry out those tasks.

Businesses that successfully manage their supply chain bottlenecks may improve their brand recognition, be cost and asset efficient, acquire a competitive edge, and even raise stakeholder value. Despite the fact that SCPRM has become more significant over the past ten years, excellent diversity relocation management still exists. In general, there is still a dearth of knowledge on how to identify and group fundamental competencies as well as how to put into practise the proper techniques and tools to assist practitioners in managing and setting up relocation efforts. Although there has been study on the development of SCM abilities at the human level, there has been relatively little research on the improvement of SCM competences at the organisational stage and level (Derwik & Hellström, 2017).

The assessment of existing literature in this chapter has shown areas in need of more study and provides evidence to support the hypotheses posed in the research questions:

1. Not all effective operational routines are drivers of logistics and supply chain competencies in the Chinese market (Ding et al., 2012). Shou and Wang (2017) argued that not all factors are considered, such as different industries and regions in Asia general. This is especially the case in China, as some region are still under economic development and have big geographical differences in approaches to an operational set up (Shou & Wang, 2017). Stentoft Arlbjørn et al. (2006) mentioned that their case study would be a starting point to delve deeper into the research for other industries. A shortage of the local Chinese culture and local regulations were observed. Cultural impact is not a well-known phenomenon, which is defined as a literature gap in some papers that study social interactions.
2. The premise behind the various relocation operation modes used by businesses is that the option mostly depends on the executives' mindset (Hutzschenreuter et al., 2011; Lewin & Volberda, 2011; Maskell et al., 2007). Cognitive models that leaders use affect the way they perceive shifts in their ecosystem and how that understanding results in certain strategic decisions. Changing environments in combination with the existing core competences has rarely been researched yet, to the best knowledge of the researcher.
3. Many investigations are conducted with only one company, a case study. Different data focusing on influential factors such as industry and region are required to develop and test a model in specific markets (Bernon & Mena, 2013; Richey & Wheeler, 2005). Ding et al. (2012) indicate in their study that only analyses of internal organisation processes had been considered so far. The impact of the relationships with external stakeholders is so far not touched.
4. Halley et al. (2006) argued that less quantitative data does not allow generalization. The trend to minimise the number of suppliers results in less data. The focus is mainly at the key supplier. Further implications are that companies are focusing on short term success; companies make different decisions for outsourcing without proper analysis of the impact on mid or long term operations (Lutz & Ritter, 2009).
5. Customers are investing less in developing new core competences. Most of the case studies investigating existing core competences are optimised and squeezed out (Halley et al., 2006). Kim and Wemmerlöv (2015) found that suppliers' success depends on customers' contributions for financial support. Companies' successes are shown mainly by financial KPIs: the focus at social competences and interactions is completely missing, both inside the companies but also externally with other stakeholders (Stuart et al., 2012; Whipple et al., 2015).

6. Employee skills are positively related to internal and customer integration; they have no influence on supplier integration (Huo et al., 2015). Secondly, more quantitative data is required to analyse and generalise reasons for cultural differences between western and developing countries (Huo et al., 2015). In most cases, the local human resource departments need coaching for development of the relatively young and inexperienced managers. This group is running the supply chain in many developing countries. The positive effect of partnerships between academic institutions and business sectors in western countries has also so far not been investigated (Mangan & Christopher, 2005).
7. Prajogo and Sohal (2013) suggest observing the connection between the skills of SC experts, SC procedures, and SC performance. An explanation for a positive effect on performance is not yet established. Further Vilela et al. (2018) strengthen this by providing direction for investigating the effects of firm environment and continuous learning form professionals.
8. Mistakes in the past due to a wrong business setup or a lack of understanding of the culture is not mentioned in any research paper reviewed in this study. One argument might be an unwillingness to be embarrassed or acquire a negative image in the specific market. Companies therefore require different level of interaction, such as inside the company, supply chain networks, or at the individual level, learning from the mistakes in the past to gain experience to do it better; (Ellinger & Ellinger, 2014; Spekman et al., 2002).

The basic theories and models in the area of technological adoption are covered in this chapter, together with the research streams on core competency and the important organisational theories for supply chain relocations. In light of this study's goal, these ideas have undergone rigorous evaluation and comparison. In order to establish the theoretical model for the research derived from the TPB (see Chapter 3), several constructs from across various theories and models have been evaluated. The primary constructions that were chosen for this study were then extracted and secured. The decision to use the TPB as the research hypothesis has also been rationalised. In addition, the conceptual model has been expanded to include the three primary TPB structures (Attitude, SN, and PBC), as described in the chapter that follows. This section also discusses a few elements related to the methodology and research strategies applied in earlier studies on technological acceptance.

3. Theoretical foundation of technology acceptance theories and models

To clarify the approach used in developing this research (with the influence of critical factors), the theoretical foundation gives an outline of technology acceptance theories and models. A summary and a review of different technology acceptance theories and models are developed. This chapter concludes with a summary, leading to the next section, which details the conceptual model and hypotheses development. Figure 8 provides a schematic summary of key parts discussed within this chapter.

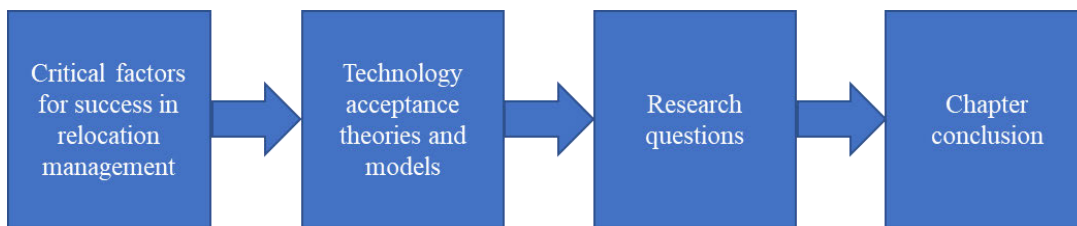


Figure 8 Schematic representation of key elements of technology acceptance theories and models
Source: The author

3.1. Critical factors for success in relocation management

While the literature review before addressed various significant studies on core competences, and section 1.5 laid the groundwork for what is required of businesses in the execution of relocation activities. This subsection is devoted to identifying the elements needed to successfully manage relocation activities to China.

3.1.1. Understanding of relocation

It has long been recognised that comprehending relocation concepts is crucial for efficient relocation implementation, and that employees of a firm must have this understanding. Numerous studies (Acedo & Galán, 2011; Deavers, 1997; Johansson & Olhager, 2018; Johansson et al., 2019; Kinkel & Maloca, 2009; Munjal et al., 2019; Pellicelli, 2021; Sharpe, 1997; Yeung et al., 2003) indicate that difficulties understanding relocation concepts, including some quality standards such as ISO9001 and other sourcing requirements, relate to subsequent difficulties in adopting the management system and organisation structure for role and responsibilities. From a different perspective, Di Mauro et al. (2018) claimed that comprehensive knowledge and the amount of in-house resources and competences need to be considered for the standards' objectives in the adoption of management systems.

It is likely that the lack of knowledge might be, to some degree, forgiven and allowed in the early phases of relocation because SCPRM practitioners are still gathering the necessary information about suppliers and/or local factory. When continuous efforts are required to

sustain relocation operation and improvements, the implications of a lack of standard knowledge are extremely critical. According to this argument due to the lack of expertise, SCPRM practitioners would find it difficult to select and put into practice suitable relocation projects at the initial stage. Lack of knowledge of relocation concepts, according to Pellicelli (2021), might increase the complexity of SCPRM's effective operation in planning and execution phase. Evaluating the SCPRM practitioners' level of understanding in offshoring will be important to companies in identifying additional resources that enhance the competencies of relocation practitioners.

3.1.1. Top management commitment for dedicated resources

According to Pedroletti and Ciabuschi (2023), a variety of variables influence business relocation. Kinkel and Maloca (2009), May and Abdullah (2020) and Pellicelli (2021) contend that the motivation either comes from inside the business or is a result of external parties' requirements. Although financial considerations, such as customer expectations, are frequently the driving forces, some businesses adopt global supply chain standards because their recommendations are practical (Pedroletti & Ciabuschi, 2023). These efforts, which are a kind of internal incentive pushed by the company, include the search of increased efficiency and productivity, higher-quality goods, and image/marketing advantages (Do et al., 2022; Fu et al., 2010). Starting with the first stage when the company decides to relocate with the manufacturing standards, top management is essential in ensuring that all requirements, processes and functions are addressed as intended and implemented accordingly (Brunner et al., 2020; Dutton, 1986; Dutton et al., 1989; Massini et al., 2010).

When senior management has committed to relocate manufacturing, resources must be identified and deployed to support the initial and continuing setup of relocation activities. Senior management may, or may not, establish a relocation steering committee, which is made up of individuals from various roles or departments, depending on the size of the company. The organisation's top management must at least appoint one person to oversee the implementation of the SCPRM activities. This individual is identified as the relocation project management ambassador. According to Shou and Wang (2017), this person is in charge of making sure of, and maintaining, the organisation's compliance with the SCM standards.

It is the responsibility of project management delegates to support and encourage initiatives to ensure that all employees within the company are aware of the needs of the purchasers. By increasing awareness of customer demands and the role that each employee plays, an improved feeling of pride in one's work might inspire one to perform better (May & Abdullah, 2020). Assisting outside parties on SCPRM-related concerns is another responsibility of the management delegate.

Therefore, the concept that management support is crucial in influencing SCPRM practitioners' perceptions of the value of relocation activities.

3.1.2. Core Competencies

Businesses must take into account the complete spectrum of competencies (and not just certain features or characteristics) and work to improve competency at all levels of analysis, from the individual to the inter-organizational level (see chapter 2.3.4). By doing this, individuals can acquire the skills required for better results across the board. Transferring people skills from the individual to the intra- and inter-organizational levels is therefore essential. Rarely is the manager's opinion of such processes observed and used to inform strategic decisions for the high technology business(see chapter 2.3.5). Derwik and Hellström (2017) examined the components of core competency of the level of the engaged parties, also known as internal, intra-organizational, and inter-organizational stakeholders.

By highlighting the whole spectrum of competencies required, the context is missing in theory for relocation manager in the process of establishing pertinent programmes and training sessions. The relocation team should include human resources, who support and advice during the hiring process. The majority of the time, HR staff members are highly educated about law and psychology but less so about the competency success factors in SCM (Derwik & Hellström, 2017).

3.1.3. Human Factors

Although the success of relocation is quantifiable in financial terms, it is crucial to consider the human factors involved. The potential and actual output are affected by the tasks that make up work, the diversity of activities involved, and the training, skill, and experience needed to accomplish a job (Stevenson, 2012; Thill et al., 2014).

Operations management professionals have only just begun to pay attention to psychological insights, although the study of human behaviour has gained ground in a variety of fields over the past twenty years, including economics, investment and marketing (Stevenson, 2012). In the vast majority of activities, including manufacturing, supply chains, operations and research and development (R&D), individuals are an essential factor of the organisation. Organisation and processes must be adopted and then used by people in order to work, just like other organisational management systems. The use of a management system modifies how employees communicate and collaborate inside a company (Mihalache, 2020).

Previous research has focused on assessing the commitment of those in top executive and administrative positions (Luo et al., 2013; Waters & Rinsler, 2010). Evaluating middle management's or supervisors' degree of commitment is essential. In relation to this, Waters and Rinsler (2010) emphasised that problems with the implementation of supply chain and operations may be brought on by middle management staff who lack commitment and employees who tend to hide threats. Given this, it is crucial to ensure that all management

levels are committed (Ellinger & Ellinger, 2014). Therefore, human factors are influence SCPRM practitioners' perceptions of the value of relocation activities.

3.1.4. Attitude and Behaviour

Mowday et al. (1979) claimed that dedication is centred around two distinct meanings that separate it into behavioural-oriented and attitudinal-oriented perspectives. The definition of attitudinal commitment, one component of attitude, is "... thus [that it] represents a state in which an individual identifies with a particular organization and its goals and wishes to maintain membership in order to facilitate those goals" (Mowday et al. 1979, p. 226). Kuiken et al. (2020, p. 570) offered another definition, stating that "The internationalization literature studies attitudinal commitment mainly in the form of managerial commitment, which is the attitude and willingness of a firm's managers to engage and invest in international activities".

The best way to define general *organisational* commitment, in the opinion of Singh et al. (2018), who explain that this is the best method to gauge the level of commitment, is as an attitude towards the organisation. In the event of a production shift, the SCPRM practitioner may be committed to the deployment and setup of all associated projects, though not because doing so advances the organisation's policies and objectives (Singh et al., 1996). Instead, they may be required to do so because relocation calls for the creation of proper documentation and systems. Finally, a person's behaviours and attitude affect how devoted they are to their organisation (Carmeli, 2003). In other words, dedication may be revealed through both actions and attitude (Kuiken et al., 2020). When this idea is used in relation to the execution of relocation operations, individual behaviour and attitude show the degree of devotion from all organisational employees to support its efficient operation. The analysis of the behaviours and attitudes of SCPRM practitioners will be the primary objective of this study. Therefore, attitudes and behaviours are important attributes for effective SCPRM relocation.

3.2. Outline of technology acceptance theories and models

This section provides theoretical background about the adoption of relocation models for companies in an offshoring process to China. In addition, this section seeks to suggest a study model that clarifies the managerial actions taken by organisations involved in such a technology migration process. This section begins with a theoretical overview of the theories and models of technology acceptance, as well as a review of prior studies on the uptake and use of this technology and other analogous technologies. The choice of the research theory will be justified using reasons that persuade and address criticisms.

In this study, it is important to mention that user acceptance and confidence are crucial for the further development or enhancing of any new technology acceptance theory (Alturas, 2021; Momani & Jamous, 2017). Besides, acceptance has been considered as a function of user involvement in systems model development. To be able to take them into account during the

relocation process, decision makers need to be aware of the factors that users draw on to decide whether or not to utilise a certain system (Venkatesh et al., 2003). It is the general question for both practitioners and researchers of why users accept new technologies or build up resistance against them, which might explain managers' behaviour on operation mode decisions. Answering this question may help managers to use better methods for designing, evaluating and predicting the response of the users. Models and ideas of technology acceptance have been used in a wide range of fields to understand and to predict users' behaviour, which is one aim of this study: to understand manager's behaviour. The development of frameworks to assess the usage of certain technologies that were developed and implemented is the outcome of several research papers in the field of technology acceptance.

A variety of frameworks and models have been created to explain user behaviour in relation to the adoption of new technologies, not only consumer behaviour (Benbasat & Barki, 2007; Kumar, 2012; Pla-Barber et al., 2019; Ramayah et al., 2012; Venkatesh et al., 2012; Vijayan et al., 2023) and these models introduce factors that can affect user acceptance, such as Technology Acceptance Model (Davis, 1985), Theory of Planned Behaviour (Ajzen, 1985), Diffusion of Innovation theory (Rogers, 2003), Theory of Reasoned Action (Ajzen & Fishbein, 1975), Motivational Model (Deci & Ryan, 1985), Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003) and Social Cognitive Theory (Bandura, 1977). Many studies have used these traditional frameworks to conduct their research and the rest combine previous models or add new constructs to developed models to carry out their study. In this investigation, acceptance of manager and their resulted behaviour is an important function of user involvement and will be considered in the model development.

The possible broad adoption models must thus be outlined in this field. To limit and justify the pertinent aspects that impact the models used for relocation by the affected stakeholder, this study presents adoption theories and models to provide an overview aimed at a better comprehension of these models and theories. Given that it is presumed from the literature that attitudes toward using or improving SCPRM practises, user beliefs, knowledge or experience, and other external variables influence behavioural intentions toward these practises, this research path will assist in the establishment of a conceptual model using one model as the main basis.

3.2.1. Theory of reasoned action (TRA)

Most studies in the area of attitude-behaviour have employed in TRA (Olson & Zanna, 1993) and this is reflected in attitude model. According to TRA, a person's desire to engage in a behaviour predicts their future behaviour. Intention is shown by both the attitude toward the behaviour and the perceived social standards around the behaviour. The model, depicted in Figure 9, was created to forecast and comprehend the relationship between behaviour and attitude. It demonstrates that people's actions may be driven in part by their expectations of how they will feel about themselves if they carry out or refrain from carrying out a specific

behaviour (Montano & Kasprzyk, 2008). According to Sheppard et al. (1988), it is helpful in determining where and how to focus initiatives for changing behaviour because the model successfully predicts behavioural intentions and behaviour. Pinder (2008) criticises that the TRA model fails to capture and overgeneralises the social processes of change and the social nature of the change itself. As an example: unawareness of the networks between individuals, both the interpersonal and social relations. Objectives in the TRA model represent decisions, while variables in the theory have specific meanings that reflect psychological notions (Francis et al., 2004, p. 8). The intention of the individual to carry out a behaviour is the most direct and crucial interpretation of behaviour in the TRA model, according to Langdridge et al. (2007). Behavioural intentions are "indicators of a person's readiness to do a behaviour," according to Fishbein and Ajzen (2010, p. 39). This approach was critiqued by Warshaw and Davis (1985) on the grounds it failed to account for common sense understanding of intentions that the majority of people hold. According to Ajzen and Fishbein (1975, p. 288), the first definitions of intentions and useful intentions were "people's expectations about their own behaviour in a certain situation" and "probability that one plans to act." One component in the reversal of behavioural intentions is the degree to which engaging in the behaviour is a high-priority personal desire for the person (Friedkin, 2010, p. 203).

Ajzen (1991, p. 181) make clear: "Intentions are assumed to capture the motivational factors that influence a behaviour; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behaviour. As a general rule, the stronger the intention to engage in a behaviour, the more likely should be its performance."

In this study, the occurrences of the purpose for relocation will be investigated. The intention is to confirm the correlation between attitudes and the intended behaviour in order to understand the localisation driver and the perceived core competences of the manager.

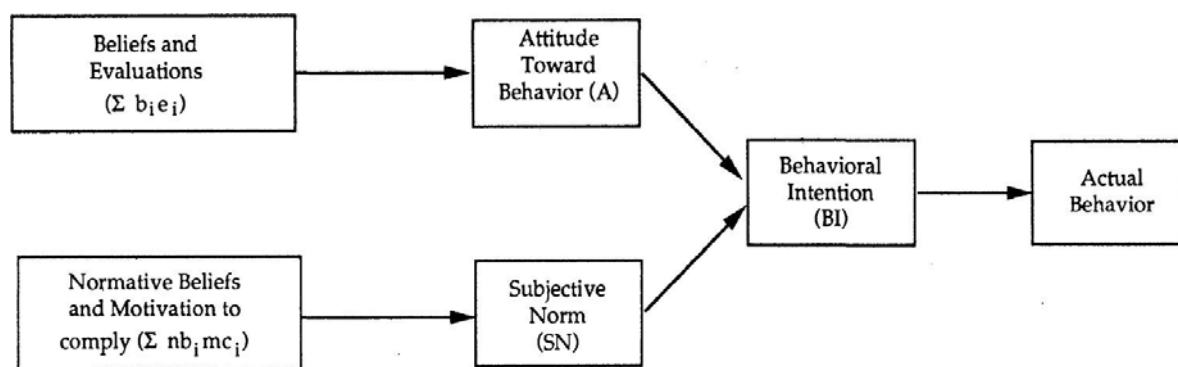


Figure 9 Theory of reasoned action (TRA)
Source: Fishbein and Ajzen (1975)

The construct definitions for the TRA model are shown in Table 9:

Construct	Definition
Behavioural belief	Belief that behavioural performance is associated with certain attributes or outcomes
Evaluations of behavioural outcomes	Value attached to a behavioural outcome or attribute
Normative beliefs	Belief about whether each referent approves or disapproves of the behaviour
Motivation to comply	Motivation to do what each referent thinks
Attitude towards behaviour	Overall evaluation of the behaviour
Subjective norm	Belief about whether most people approve or disapprove of the behaviour
Behavioural intention	Perceived likelihood of performing the behaviour
Behaviour	Action that will or will not take place

*Table 9 Constructs and definitions of the TRA model
Source: Adapted from Glanz et al. (2008)*

According to Sheppard et al. (1988), the best indicator of intentions is whether a person has made deliberate preparations for acting. As individuals take into consideration their own intents, ability to act, and assessment of the environment in which they would act in terms of barriers to or facilitators of action, following their expectations should be a better predictor of actual behaviour, since they account for their own intentions, capacity for action, and judgement of the environment in which they would act in terms of obstacles or enablers of action. According to the TRA model, a behaviour's purpose is influenced by both subjective norms and one's attitude toward the behaviour. In contrast to subjective norm, which relates to an individual's views of social pressure to do or not present a behaviour, an individual's attitude is their evaluation of what it would be like to engage in a behaviour in general (Langdridge et al., 2007). In situations where there were restrictions on actions, Armitage and Conner (2001) suggested that the ordinary creation of an intention was insufficient to predict behaviour. Instead, TRA could properly anticipate comparatively uncomplicated behaviours (i.e., under volitional control). Even if there have been numerous challenges to this premise, it is generally believed that people are more likely to engage in behaviours that are seen as being attainable (Bandura, 1997). The TRA was developed to predict volitional behaviours, or activities that an individual has significant control over, according to Langdridge et al. (2007). To further explain, Ajzen (1991, pp. 181-182) defended the viewpoint as follows: "it should be clear, however, that behavioural intention can find expression in behaviour only if the behaviour in question is under volitional control, i.e., if the person can decide at will to perform or not perform the behaviour."

Individual norms and standards by Fishbein (1967), ethical responsibilities by Gorsuch and Ortberg (1983) and Zuckerman and Reis (1978), as well as conflicting attitudes by Davidson and Morrison (1983) have all been evaluated for inclusion or expansion of the TRA model. By including the idea of perceived control over behavioural attainment as a component in influencing behavioural intentions and behaviour, Ajzen (1985) added to the TRA model. The theory of planned behaviour (TPB) model, which is covered in more detail in the following section, was created as a result of the expansion of the TRA model.

3.2.2. Theory of planned behaviour (TPB)

Theory of planned behaviour (TPB) is an enhancement to the theory of reasoned action (TRA) model, created by Ajzen (1985) who improved by extending the TRA model's underlying assumption of no or little volitional control. This is accomplished by including ideas about having the necessary resources and opportunity to engage in a certain behaviour (Madden et al., 1992). Figure 10's representation of the extra prognosticator, known as the perceived behavioural control (PBC) variable, was added to the model. It has been suggested that PBC can predict and explain both behaviour and intention (Rawstorne et al., 2000) and evaluates a person's impression of control over carrying out a certain behaviour (Ajzen, 1985). The more possibilities and resources people believe they have, the more control they should have over their behaviour and actions (Madden et al., 1992).

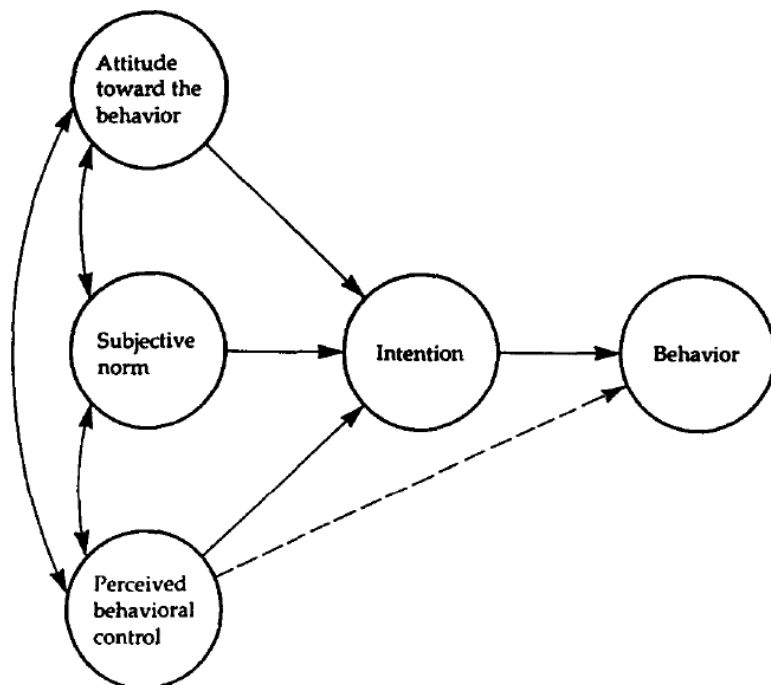


Figure 10 Theory of planned behaviour (TPB)
Source: Ajzen (1991)

PBC is defined as " the extent to which a person feels able to enact the behaviour" according to Francis et al. (2004, p. 9). PBC is a factor that the TPB model includes as an exogenous variable, and through intentions, it directly and indirectly influences behaviour (Madden et al., 1992). According to Francis et al. (2004), PBC includes two components: the degree of a person's control over their behaviour and their level of self-assurance on their ability to do or refrain from performing the behaviour. Managers' intentions are the best indicator of management behaviour, according to TPB reasoning. Additionally, management attitudes, social pressure emotions, and perceptions of control are indicators of manager intents (Game & Apfelthaler, 2016).

Francis et al. (2004, p. 7) emphasised that it is important to understand the following circumstances when using the TPB to determine if a person wants to accomplish something:

- attitude: whether the person is in favour of doing it
- subjective norm: how much the person feels social pressure to do it
- perceived behavioural control: whether the person feels in control of the action in question.

Empirical proof that individuals' behaviour is significantly impacted by their belief in their capacity to carry out the behaviour was offered by Bandura et al. (1980). The motivating effect of controlling behaviour through intentions is seen in the structural connection between PBC and intentions. According to Rise et al. (2010, p. 1068), the TPB framework presupposes: "the more positive the person's attitude, the stronger the subjective norms and the greater the perceived control over the behaviour, the more likely it is that the person will intend to perform the behaviour".

Sniehotta (2009, p. 262) claim "the stronger the intention and PBC towards a behaviour, the more likely one is to take the intended action". In contrast to the notion that intention is a linear function of PBC plus attitudes toward and/or subjective norms surrounding the target behaviour, the TPB finds that behaviour is determined to be a linear function of intention and PBC (Ajzen, 1991). TPB foresees potential behavioural impacts of PBC, while PBC displays motivational elements that influence behaviour indirectly through intentions. Furthermore, PBC represents actual control and is directly related to behaviour that is not supported by purposes (Madden et al., 1992). As stated in Ajzen's (1991) summary of the TPB:

Intentions to perform behaviours of different kinds can be predicted with high accuracy from attitudes towards the behaviour, subjective norms, and perceived behavioural control, and these intentions, together with perceptions of behavioural control, account for considerable variance in actual behaviour (as quoted in Rise et al., 2010, p. 179).

According to Trafimow (2009), hundreds of investigations that have been conducted utilising either one or both of the two theories separately or together, demonstrating that TRA and TPB

are some of the very well-known as well as significant methodological approaches in the conduct of societal psychology. TPB's effectiveness as a predictor of intentions and behaviours was further supported by research (e.g. Conner & Armitage, 1998). According to the findings of this meta-analysis, attitude was the most effective predictor of behaviour, followed by perceived behavioural control and subjective standards. This study's hypothesis will consider the weight of the predictors, in particular the weighting of the core competence element groups. But new or modified models continue to appear in social science research (Giampietri et al., 2018; Moons & De Pelsmacker, 2015). In several management sectors, such as entrepreneurship (Kolvereid & Isaksen, 2006), export activities (Acedo & Galán, 2011; Morgan & Katsikeas, 1997) or business growth (Wiklund & Shepherd, 2003), the TPB has been extensively utilised to analyse the link between people's goals and organisational behaviour, which fits with the aim of this study and will be used.

3.2.3. Technology acceptance model (TAM)

The technology acceptance model (TAM) was studied by Davis (1985) in order to evaluate end user information systems on actual users. He created this model to clarify the variables influencing computer usage behaviour. That paradigm has become more and more common in the field of information systems during the past twenty-five years. This model is now one of the most popular and widely used models for explaining how people adopt information systems (Farahat, 2012; Morris & Dillon, 1997; Straub & Burton-Jones, 2007; Yi & Hwang, 2003). It has been expanded, changed, or adapted in a variety of ways and may be utilised in a wide range of contexts (Lewis et al., 2003).

Using TAM ability was beneficial compared to TRA and TPB, according to Han (2003) and Lai and Zainal (2015). TAM gives a solid theoretic foundation, offers sufficient justification and prediction of how diverse client groups will react to a variety of systems and technologies in various organisational and cultural settings and at varying degrees of competence (Yousafzai et al., 2007, p. 264). This approach has also gathered substantial empirical evidence to back up its overall descriptive influence, and it has become known as a key paradigm of how users adopt technology (Chau, 1996; Hu et al., 1999; Mathieson, 1991; Szajna, 1996). Bagozzi (2007, p. 244) acknowledged: "TAM has consistently outperformed the TRA and TPB in terms of explained variance across many studies". The fact that TAM is straightforward and clear is another factor that contributes to its appeal and adoption, according to King and He (2006). In Figure 11, the original model is shown.

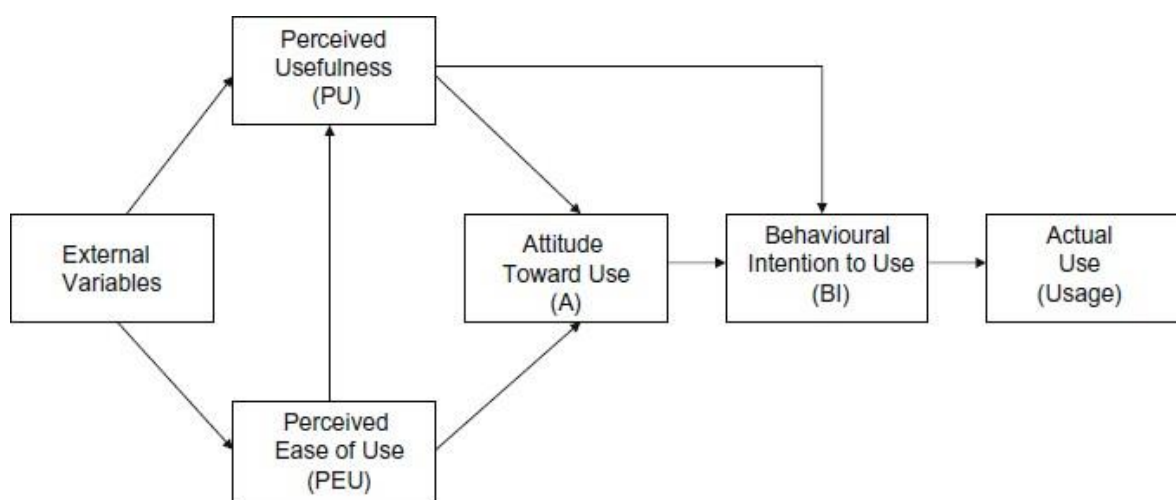


Figure 11 Original Technology Acceptance Model (TAM)
Source: Davis (1985)

According to Burton-Jones and Hubona (2006) , the TAM is built on the following four major stages:

1. User views about utilising the system are influenced by external factors
2. User attitudes about utilising a system are influenced by their beliefs
3. User behaviour is influenced by their opinions toward a system
4. User intents determine the system's degree of utilisation

The initial model was further enhanced by Davis and Venkatesh (1996) after it was discovered via further research that attitude toward utilising a system only partially mediates the impact of perceived usefulness on intention. According to Davis et al. (1989) this is because people may utilise technology in work settings even if they do not have a favourable attitude toward doing so because it could increase productivity and be viewed as advantageous by them. The attitude construct was part of the original theoretical TAM. However, due to the fact that attitude did not entirely mediate the effect of perceived usefulness on intention, it was decided to exclude the attitude construct from the finalized TAM (Davis et al., 1989, pp. 995 - 996) The updated TAM, without attitude variable, is shown in Figure 12.

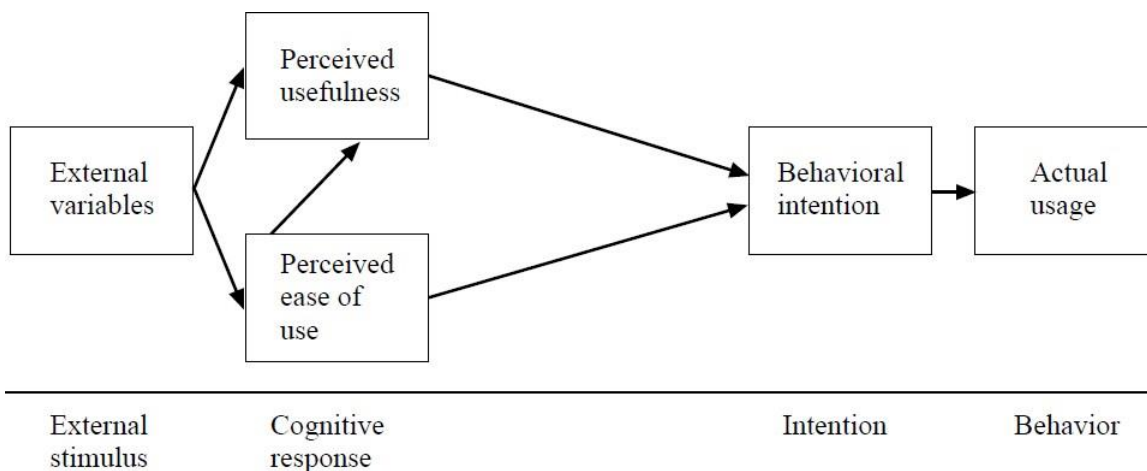


Figure 12 TAM refinement without attitude variable
 Source: Davis and Venkatesh (1996)

Objections to the technology acceptance model (TAM)

Most theoretical models will include both arguments for and against the model, as well as justifications for using it in particular situations (Saunders et al., 2009). In order to have a comprehensive picture of the model, it is also necessary to consider various cognitions. According to Benbasat and Barki (2007), TAM research has taken up a significant amount of the IS community's attention, and the fundamental TAM has been created "almost to the point of certainty" (p. 225). They believe that this is mistaken in many respects since it suggests that TAM is the only methodology available for examining information system (IS) adoption. Instead of creating theoretical clarity for the IS area, this has instead created "theoretical confusion" (Taherdoost, 2018). Part of this theoretical misunderstanding, in the opinion of (Benbasat & Barki, 2007), stems from the notion that a theory must offer "actionable" (p. 224) guidance, and TAM, in their opinion, falls woefully short in this area.

Lee et al. (2003) explicitly mention this point in their meta-analysis of TAM. TAM studies are thought to occupy around 10% of the field's overall journal capacity. This seems to be way too high given the broad range of topics that are often regarded as essential to the IS discipline. Straub et al. (2004) assert that theories are more reliable when many measurement techniques are applied and produce comparable findings. TAM is based on TRA, which is best suited for assessing behaviour (Adams et al., 1992; Ajzen & Fishbein, 1980; Al-Gahtani & King, 1999; Levine & Donitsa-Schmidt, 1998) in circumstances where volitional control is present. This gives rise to the worry that TAM may not work well with required system settings. Therefore, for this investigation, the SCPRM settings need to be carefully chosen (Allgood & Walstad, 2013; Evaristo & Karahanna-Evaristo, 1993).

Mandatory system usage, as defined by Sørenbø and Eikebrokk (2008), is when a user is compelled to utilise a certain system. In the scope of SCPRM operations, it is necessary to further investigate prospective models under voluntary and mandatory usage of a system, given

the rules imposed by reporting requirements, legislation, or other or not directions and directives. The purpose of this research is to understand the various phenomena in the ownership of the firm in order to comprehend this for the various company constructs. The underlying premise is that, at least for businesses that have embraced SCPRM methods, this is not totally dependent on their free will; as a result, managers in charge may face certain limitations on their ability to freely choose how to use a system.

3.2.4. Diffusion of Innovation Theory (DOI)

As explained in section 1.4.5, new technologies and innovation are the driver for relocation (Almada-Lobo, 2016); to understand why an invention is adopted or not, the DOI theory may provide a useful overall framework (MacVaugh & Schiavone, 2010). It is beneficial to gain knowledge of the contextual factors that affect the adoption decision model using the Rogers (2003) components, including why these factors might affect how people perceive or think about innovations and where these factors—which may be internal or external—will lead to the successful adoption or rejection of innovations. It also offers a useful framework for comprehending the benefits, drawbacks, and difficulties associated with adopting an invention. Moreover, it acts as a manual for assessing the success rate of an innovation as well as the pace at which it diffuses in a given environment.

The Spread of Innovations Model proposed by Rogers (2003) is one of the most often mentioned ideas (Sahin, 2006). In his book, Rogers (2003) outlines five sequential steps in the adoption of innovations. Using social networks or other channels, an individual or organisation learns about a novelty, forms an opinion or attitude toward it, chooses whether to adopt or reject it, puts the innovation into practice, and then confirms their decision to adopt it. Before the potential adopter's innovation-decision technique, there are a number of factors, such as prior experiences, demands or problems that need to be solved, including uniqueness, and societal norms, that draw adopters to the approach in the first place.

Four elements that are pertinent to the diffusion of innovation approach are captured by Roger's DOI theory. These are the four components:

- (1) Innovation: by Rogers (2003) definition this can be a plan, procedure, or product that's recognised as different by a private or alternative unit of adoption. Here, Rogers (2003) asserts that while an invention may have obtained existence recently, the novelty of an innovation is set once the potential adopter becomes aware of it, making it unfamiliar to them. The knowledge of the innovation, the appeal to adopt the innovation, and the call to adopt the innovation are all related to how people perceive it.
- (2) Communication channels: these are the channels or ways in which information about an innovation is passed from one person to another. A source is defined as a person or an organisation that produces data, whereas a channel is the route by which information is delivered from the sender to the receiver (potential adopter). These channels of

communication are potent instruments that work as agents of alteration towards the acceptance of an invention. They play a significant function at the information stage further as the process of arriving in the innovation decision making process (Rogers, 2003).

- (3) Time: the time components rely upon the choice procedure, the relative time with that an invention is adopted by a person or party. Rogers (2003) employs the time component inside the parent classification approach to capture the speed of adoption of innovations. He adds that the bulk behavioural research tends to disregard the time component within the uptake of innovations. Time might be a useful component to capture the unfolding of the innovation among its adopters and furthermore within the innovation-decision procedure, as the five steps described by Rogers (2003) occur in an specifically time-ordered sequence.
- (4) Social system: is that the fourth aspect understood inside the diffusion method. The social organisation may consist of a number of reticulate units working together to solve problems in order to accomplish a common objective (Rogers, 2003, p. 23). The structure of a social organisation has an impact on how quickly an innovation spreads within it. The social organisation also affects how original the individuals or groups that make up the social organisation are. For the purpose of classifying adopters, Rogers (2003) uses the level of originality associated with the individuals or group members within the social organisation.

Despite its connection to and well-liked application inside varied fields of analysis, DOI theory has its detractors, like most theories. According to Lambkin and Day (1989) the demand side of the economy is too closely entwined with the DOI theory. They say that DOI disregards critical elements including marketing mix factors, competitiveness, distribution of resources, and the way they may impact the rate and structure of diffusion in innovation leading in the “issue of equality”. Wolfe (1994) asserted that DOI assumes that a single model could indeed foresee the implementation of various types of innovations among various types of people and contextual factors. According to Downs and Mohr (1976) the DOI ignores crucial considerations like those pertaining to necessary expenses and special facilities. The DOI was also criticised by Rogers (1976) for ignoring social factors, including how a structure of society may influence or encourage new technology adoption.

Apart from the different disciplines that TAM and DOI ultimately came from, there are clear parallels in the two approaches that show they support one another (Chen et al., 2002). In TAM, the perceived usefulness idea is regarded as the competitive advantage of an innovation. It is also noted that the complexity characteristic has parallels with perceived ease of usage inside TAM. The section that follows discusses the social cognitive theory (SCT). In this example, SCT is based on concepts from Rogers (2003)’s work that emphasise changing people’s behavioural patterns individually.

3.2.5. Social Cognitive Theory (SCT)

Inspired from social psychology, social cognitive theory SCT was proposed primarily based on three main elements; behaviour, personal, and environment which can be interacted bi-directionally so that you can predict both institution and character behaviour. Moreover, it could identify strategies that can alternate and modify behaviour (Bandura, 1977, 1986). In SCT, the behaviour element is chiefly targeted on utilisation, overall performance and adoption issues. However, the personal component is any personality, cognitive and demographic components characterising a person. Moreover, environmental factors include bodily and social elements, which each are physically external to the character. SCT is an inseparable triadic structure which posits that in everyone, three elements continuously affect one another, reciprocally determining each other. SCT version is integrated to evaluate the data generation utilisation by the use of some constructs, which include self-efficacy, final result expectancies, overall performance, anxiety, affect, and final personal results expectancies.

Vicarious capacity is one of SCT's main characteristics. This requires experiential learning, studying other community's training concepts, or developing them without having to show beliefs about behaviour. Due to the fact that individuals generally gain experience through observation, there are many benefits to this, including better time management and mistake prevention. The necessity for trial and error is therefore eliminated. According to Bandura (1989), new behavioural patterns, behavioural competition, new behavioural rules, and criteria for self-assessment and decision-making are all learning patterns. SCT is viewed as an admirable model and is verified when it comes to analysing individual behaviour (Igbaria & Livari, 1995).

There is little controversy between SCT and DOI Theory, which integrates social cognitive theory and social diffusion theory, and refers to Rogers diffusion of innovation theory, defined thus by Bandura (2006, p. 119): "Social cognitive theory distinguishes among three separable components in the social diffusion of innovation. This triadic model includes the determinants and mechanisms governing the acquisition of knowledge and skills concerning the innovation; adoption of that innovation in practice; and the social networks through which innovations are propagated and supported" indicated by. Because of how information is obtained through advancements in communication technology, the process of social dissemination is unique, in Bandura's view. Concepts, values and practices have now globalised and become universal. And the development of observational education, particularly in its early stages, has been highlighted in the electronic media as a key tool for contemporary dissemination. Manager perception of new, required information technologies on an individual basis is a phenomenon that will be investigated in this study, as for example to consider in the communication tools and methods already in place or in setup.

3.2.6. Motivational Model (MM)

Another model in terms of technology acceptance is the motivational model (MM), tested by Davis et al. (1992). Much research in the field of human behaviour considers motivational factors as the primary drivers of behaviour in a variety of entirely distinct circumstances (Davis et al., 1992; Vallerand, 1997). Motivated individuals are the subject of several theories. Motivated individuals are the subject of several theories. According to Deci and Ryan's (1985) Self-Determination Theory (SDT), self-determination involves the use of selection. Deci et al. (1991) claimed that STD was capable of distinguishing between deliberate control and self-determination, which distinguished SDT from other theories. According to them, psychological feature-acts can be considered self-defined since the individual recommends them, in contrast to behaviours that are monitored once compelled by internal or external pressures. This led to the separation of motivating factors into two categories: internal motivation and external motivation (Davis et al., 1992; Vallerand, 1997). According to Vallerand (1997) intrinsic motivation refers to internal or intangible rewards, such as the experience of delight or pleasure that influences people's behaviour regardless of the expected results of their actions. It is vital to explore further in this study the effects of motivational variables, both internal and external, to obtain significant findings on relocation operations.

Extrinsic motivation, in contrast, is linked to incidental incentives or rewards that encourage people to act in ways that will lead to desired results, like time savings and work performance. (Davis et al., 1992). The assumption that effectiveness for relocation impacts manager's decision is an important factor. Being intrinsically motivated is distinct from extrinsically driven behaviour, in that the former entails deriving pleasure from engaging in an action without the expectation of a financial benefit, whilst the latter is carried out to fulfil an obligation and not as an option (Vallerand & Blssonnette, 1992). The motivational model of technology adoption was tested in terms of acceptance by Davis et al. (1992). They discovered that the primary drivers of deliberate behaviour related to technology use were extrinsic and intrinsic motives. The study focused on how computers might be used in the workspace. In this case, the intrinsic motive was the perceived delight of utilising the technology, independent of the outcomes. The extrinsic motivation was the possibility of financial gain if the technology was accepted as useful.

3.2.7. The Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT model, created by Venkatesh et al. (2003), adds new influencing elements that affect users' intentions to adopt a technology. The theory of reasoned action (TRA), the theory of planned behaviour (TPB), the technology acceptance model (TAM), the motivational model (MM), the diffusion of innovation theory (DOI), and social cognitive theory (SCT) are a few examples of notable acceptance and usage models in IS analysis that are integrated into the UTAUT model. According to the integrated UTAUT model, performance expectations, effort expectations, social influence, and enabling conditions are the four main elements that have the most impact on users' adoption of and usage of IS. Performance expectations are similar to perceived usefulness, which is defined as the degree of consumers' impressions of a technology's specific performance (Venkatesh et al., 2003). The extra elements of the UTAUT, “effort expectancy, social influence, and enabling conditions”, describe user expectations for a variety of key characteristics of system use, including cost, social context, and usage environment (Venkatesh et al., 2011). The UTAUT model has been widely and successfully utilised in several studies about the use of technology and adoption, like on-line stock transactions (Wang, 2005) and logistic research (Lis Gutierrez et al., 2017). Further is the aim to understand the impact of the acceptance of new technologies as new communication platforms, which are required in a relocation process and the reflection on the perceived behaviour of individuals involved, as well the organisation.

Moreover, the UTAUT model had been demonstrated to be valid for large, real-world knowledge, and was methodologically reviewed and showed the foremost noticeable difference within the explained variance of intention to use (70%) and usage behaviour (52%) by Tang and Chen (2011). Its instructive power provides it an advantage over the other theories and versions of the TAM (Tang & Chen, 2011). Moreover, it uses moderators such as experience, voluntariness of use, gender, and age, and also the following constructs, displayed in Table 10:

Constructs of UTAUT	description
1. Performance Expectancy	It is that the equivalent of perceived usefulness in technical acceptance model (TAM). It also equates with extrinsic motivation as of the motivational model (MM), relative advantage as of the diffusion of innovation theory (DOI), and result expectancies from the social cognitive theory (SCT). In UTAUT, it is outlined as “the degree to that a personal believes that victimisation the system can help him or her to achieve gains in job performance” (Venkatesh et al., 2003, p. 447)
2. Effort Expectancy	It is that the equivalent of Perceived Ease-of-Use in usefulness in technical acceptance model (TAM). It is additionally the equivalent and simple use in diffusion of

	innovation theory (DOI), In UTAUT, it is outlined as “the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450).
3. Social Influence	It is the equivalent of subjective pattern in theory of reasoned action (TRA), technical acceptance model (TAM), and theory of planned behaviour (TPB). It is additionally the equivalent and image in diffusion of innovation theory (DOI). In UTAUT, it is outlined as “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al., 2003, p. 451)
4. Facilitating Conditions	It is that the equivalent of perceived activity management in theory of planned behaviour (TPB). It is additionally the equivalent of facilitating conditions and compatibility in diffusion of innovation theory (DOI). In UTAUT, it is outlined as “the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” (Venkatesh et al., 2003, p. 453).

Table 10 Description of constructs for UTAUT model

As seen, UTAUT incorporates elements from a variety of earlier versions. The increasingly widely used UTAUT itself has been the focus of various extensions. UTAUT, for instance, is increasingly considering the reality that IT is now being utilised outside of the commercial settings for which it was first developed.

3.2.8. Summary of technical acceptance theories affecting behaviour

One objective of this study is to understand managers’ behaviour by adopting a proven technology acceptance theory. Technology acceptance models and theories have been applied in a wide variety of domains to understand and to predict users’ behaviour. The most important common technology acceptance theories and models, as well as their shared constructs, have all been summarised in this section and are shown in Table 11 below. Additionally, this section has discussed each theory and model's origins and development, highlighted certain model revisions and extensions, and hypothesised some empirical findings from earlier research that used and embraced these versions of the technology acceptance theories and models. This study's goal is to comprehend management behaviour by using a tried-and-true model and theory of technology acceptance. To understand and forecast user behaviour, a wide range of fields have deployed technology acceptance theories and models.

Author	Technology acceptance theories and models	Collective structures affecting behaviour (Intention and actual behaviour)
Ajzen and Fishbein (1975)	Theory of recent actions (TRA)	Attitude / subjective patterns / perceptions
Ajzen (1985)	Theory of planned behaviour (TPB)	Attitude / subjective patterns / perceived behavioural control
Davis (1985)	Technical acceptance model (TAM)	Perceived usefulness / perceived ease of use / attitude
Rogers (2003)	Diffusion of Innovation (DOI) Theory	Innovation features / innovators characteristics
Bandura (1977)	Social Cognitive Theory (SCT)	Personal factors / environmental influences
Venkatesh et al. (2003)	The Unified Theory of Acceptance and Use of Technology (UTAUT)	Performance expectancy / effort expectancy / social influence / facilitating conditions

Table 11 Collective structures of technology acceptance theories and model in this study

The TPB fits the study's objectives best, after a discussion of the various technical acceptance theories and models, and it suggests that motivation (attitude) and existing capabilities (perceived behavioural control) collaborate to determine intention as well as, in turn, behaviour. A manager's resources must, to some extent, influence the likelihood of achieving desired behavioural outcomes (Ajzen, 1991).

This research examines relocation mode choices using the TPB's justification. The TPB provides a cost-effective explanation for how incentive affects behaviour (Ajzen, 2020). The TPB holds that behaviour is thought to have its beginnings in purpose. Intentions are associated to motivation in the sense of an individual's deliberate strategy or choice to exert effort to carry out the behaviour. Human intentions are often quite reasonable, however the manager's intentions are likely to incorporate several goals and metrics (Hutzschenreuter et al., 2007). When deciding to internationalise and choosing the control method, the maker's decision-mindset is a key factor (Game & Apfelthaler, 2016). In this study, as previously stated by Musteen (2016), the attitude of certain executives provides a more thorough explanation of a relocation choice for businesses in various industries and at various phases of the product life cycle. The selection of relocation operating modes is an intentional-planned key strategic subject, according to this behavioural approach. When a person is in favour of acting in a certain way, manager attitudes are utilised, and the subjective norm describes how much social pressure (such as that seen in family businesses) and control the person feels over the activity in question (e.g., size of the company). It is significant to note that user acceptance and confidence are essential for the advancement or improvement of any new technology acceptance hypothesis in this study. Additionally, it has been suggested that user participation in the creation of the systems model influences acceptability. Decision-makers must be aware

of the criteria consumers use to determine whether or not to use a certain system in order to take them into account throughout the relocation process.

3.3. Research questions

From the literature review, and to achieve the proposed conceptual framework, the following research questions are developed from the perspective of DACH companies in relocation practises for SCPRM.

Three research questions are investigated in the study:

- 1) Which perceived attitudes and behaviours affect the intention for strategic relocation practises in DACH (Germany, Austria and Switzerland) companies in a relocation process to China?
- 2) What core competences influence managers intention for relocation and how interdependent are these competences?
- 3) What factors influence the decision of operation modes between family managed, family owned and public companies in the beginning of a localisation process?

In the area of SCPRM, there is not enough of theory-based empirical research. The creation of the research questions was facilitated by this. The goal of this research is to address this gap for the benefit of the industry and its stakeholders, policymakers, and other people who are interested in the topic of SCPRM.

3.4. Chapter conclusion

The research questions presented in Chapter 3.3 were derived from the results of the literature review reported in Chapter 2. A theoretical foundation on the adoption of relocation models for businesses engaging in an offshore process to China was developed. Furthermore, this chapter examined the critical factors to propose a research model that explains management decisions made by firms involved in such a technology migration process. The theoretical overview of technology acceptance theories and models were followed by a review of earlier research on the adoption and usage of the TPB and other related technologies. The choice of the TPB is supported by the arguments developed in this chapter. The next chapter provides the adapted model development and design to establish and justify its selection for the development of the research hypotheses that frame this investigation.

4. Research theoretical model and hypothesis development

An explanation of the conceptual design model utilized by the researcher is given in this section. It further clarifies the construct selection and mapping processes and further describes the best-known SCPRM constructs that were developed from the literature review. After that, construct details and hypothesis development for the study will be established out of valid arguments and interpretations derived from the literature review. The section concludes with a summary. Figure 13 provides a schematic summary of key parts in this chapter.

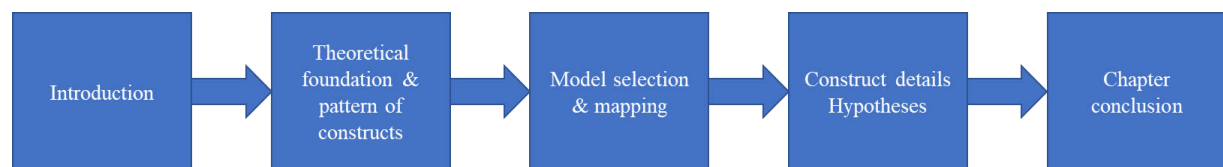


Figure 13 Schematic overview of key elements of conceptual design and hypothesis development

4.1. Introduction

The intention of this research is to investigate the current practices for production and supply chain localisation for capital equipment with an emphasis on China. As mentioned earlier, most of the investments for semiconductor, display and solar industry are planned in China. This study will identify strategic relocation practices, and structure and summarise existing core competences clusters. Furthermore, it will investigate the aspects of stimulus caused by the impacts of globalisation on such practices, how they are intentionally detected by the involved managers and how different concepts or models are introduced to their important stakeholders and affect their behaviour for relocation decisions.

Different theories are analysed in order to examine and improve knowledge of social elements, including perceptions, attitudes, and behaviours that influence or underscore SCPRM processes. According to Creswell (2013, p. 52), understanding the factors that influence a trait or attribute of a person or organisation that can be measured or monitored is necessary before developing quantitative theories. The people or organisations being investigated may differ in these traits or qualities.

In conclusion, the goal of this study is to evaluate theoretical hypotheses using precise measurements of the variables. This study uses hypothesis testing to uncover the numerous human elements that have an impact on SCPRM processes. It is clear that the positivist paradigm approach is preferred in this investigation. Testing and identifying novel correlations between variables and linking them to a hypothesis is another goal of the study (rather than developing theory).

4.2. Theoretical foundation

On the basis of the information from the literature review (see chapter 3.2.8), a fundamental conceptual framework for this study was developed. This is seen in Figure 14, which also shows the variables being studied. Further consideration will be given to theories that explain these occurrences since, as in many organisations, people's attitudes, knowledge, acceptance, and behaviours still have a significant influence on how widely-adopted systems or projects are used and improved.

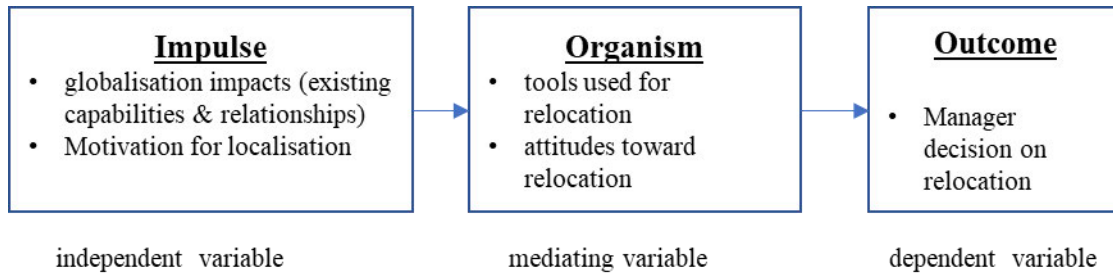


Figure 14 Conceptual research basic model
Source: Adapted from Lavastre et al. (2012)

There is general agreement that empirical research on relocation management needs theoretical underpinnings, as indicated in chapter 1.3 (Buckley & Ghauri, 2004; Di Mauro et al., 2018). To aid in the quest to comprehend how human aspects, such as lie perceptions, attitudes, and behaviours, impact relocation actions, relevant behavioural-based social psychology research was explored in chapter 3.1.2. A theory is a methodical approach to understanding behaviours, attitudes, or circumstances. The study's emphasis on human elements in connection to the relocation of SCPRM makes it clear that the theoretical basis should be founded on behavioural principles. Explanatory theory and change theory are two categories for theories in the behaviour domain, according to Glanz and Bishop (2010). The former is used to describe behaviour, whereas the latter is utilised to create more potent means of influencing behavioural change. Theories that are explanatory focused (rather than change oriented) receive more attention because the goal of this research is to identify the human variables impacting the relocation operations. This is a crucial first step in examining why people view relocation management actions differently and in gathering data that can be used to create intervention methods that will effectively manage SCPRM. The time span permitted for this research created a limitation, and the fact that offshore or relocation happens over time and should be considered as a process (not an event), which affect the inclusion of change behaviour theory for this study.

In addition to the primary review of the literature carried out to shed light on assertions relating to human factors in SCPRM, additional literature (separate from the relocation management background) is used to identify useful and suitable theoretical models that can be used as references to support the development of the theoretical framework for this study. Literature in the field of information systems (IS) is used as a relevant reference for behaviour-based

theories, since research has long explored how behaviour impacts how people recognise and embrace IS (Dzikowska & Malik, 2022; Ranganathan & Balaji, 2007).

For instance, Yi and Hwang (2003) provide insight into how a lack of acceptability contributes to the inadequate abandoning of IS. When applying this logic to the context of relocation, the same result—a lack of acceptability of the organisation's activities—occurs. Relocation practitioners would lead to negative performance if the relocation activities and methods are only superficially implemented to meet the minimum requirements of the entrepreneurial goal. The research conducted by Aboelmaged (2010) found connections between the function of information systems and buying procedures. Examining possible connections between the two systems that companies may use as competitiveness tactics justifies the significance of IS and SCPRM. Aboelmaged (2010) argued that organisations employ both IS and buying (a component of SCPRM) as tools to boost productivity and efficiency.

By employing intention as a stand-in for behaviour, these investigations significantly advance our knowledge of IS conduct (Ajzen, 2011; Sniehotta, 2009). The link between intention and behaviour has been established over time by empirical data (Yi & Hwang, 2003).

4.3. Patterns of constructs in relocation management

Relocation is defined as the offshoring of processes and/or operations into other nations (Levy, 2005). A relocation can, however, be done in a variety of ways. The business can carry out these functions either through its own subsidiary in a different country (external relocation) or by contracting out to independent businesses based abroad (internal relocation). As highlighted in the literature review, transaction cost theory considers such choice of sourcing decision between making or buying (Williamson, 1977). Despite its obvious benefits, relocation also poses challenges that companies must address. Relocation might involve relying on outside service providers and having trouble managing connections with local service providers (Currie & Willcocks, 1997). Nonetheless, the trade-off between control and flexibility in funding is a particularly challenging issue that most businesses face (Quinn & Hilmer, 1994). The dynamic and volatile environment in which today's businesses operate necessitates flexibility as a desirable quality (Scherrer-Rathje et al., 2014). There are different relocation options depending on the management and flexibility needs of the company. The captive model, because it owns the property, gives an organisation complete control over its overseas units, but overseas subsidiaries are expensive and often not sufficient, due to the higher level of commitment. In contrast, relocation outsourcing is more flexible, but because trading partners are independent entities, they pose a significant administrative challenge to corporate procurement. Concurrent models (Mols, 2010) fall midway between captive and offshore outsourcing models in terms of control and flexibility, but they are particularly expensive and difficult to establish because offshore enterprises must cover the expenses of manufacturing and outsourcing (Parmigiani, 2007). In this instance, the advantages must exceed the drawbacks.

Relocation outsourcing has considerable potential, but it seems to create a control challenge to delivering business by withholding administrative competence. Here, sourcing companies must rely on the existing contracts' legal protection since they are unable to employ formal or informal control methods to align themselves with the objectives of the local suppliers. Although supply firms have less influence over their external partners in the competitive model of relocation outsourcing, their activity is more internally integrated. Similarly, supply companies carry more weight in the competitive model than their foreign partners in the foreign outsourcing model. In the international outsourcing model, supplier businesses are given more credit than their overseas counterparts in the competitive model. This is similar to how the concurrent model supports expanded production capacity, meaning supplier businesses can reduce their fixed investment by condensing their value chain (refer to Figure 15).

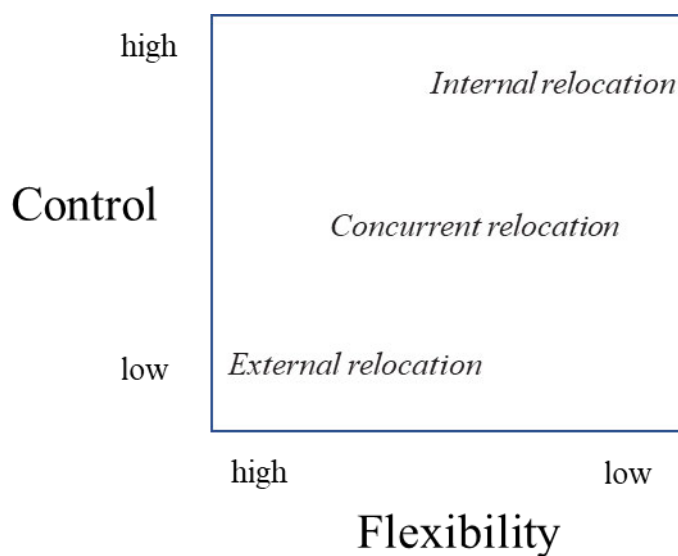


Figure 15 Relocation control and flexibility
 Source: adapted from Pla-Barber et al. (2019)

The question of relocation control and flexibility is how to optimise internal and external acquisitions (Quinn & Hilmer, 1994). The combination of costs and advantages gained from relocation operations directly influences the level of control and flexibility. In this regard, selecting the best operating strategy for relocation is a crucial strategic choice to address complicated and nebulous challenges and necessitates a significant investment of resources from the business (Mintzberg et al., 1976).

4.4. Model selection and mapping

Based on the basic framework shown in Figure 15, the general hypothetical model is derived from the TPB presented in Figure 16. This model illustrates the correlation between behaviour and many predictors that influence manager intent. However, as previous TPB studies (Acedo & Galán, 2011; Wiklund & Shepherd, 2003) mention, this study tries to include all relationships in the model and show the developed hypotheses. Attention is given to the direct

impact of the major predictor (manager's attitude), by controlling social pressure and capabilities.

Overview of proposed research model:

Research model

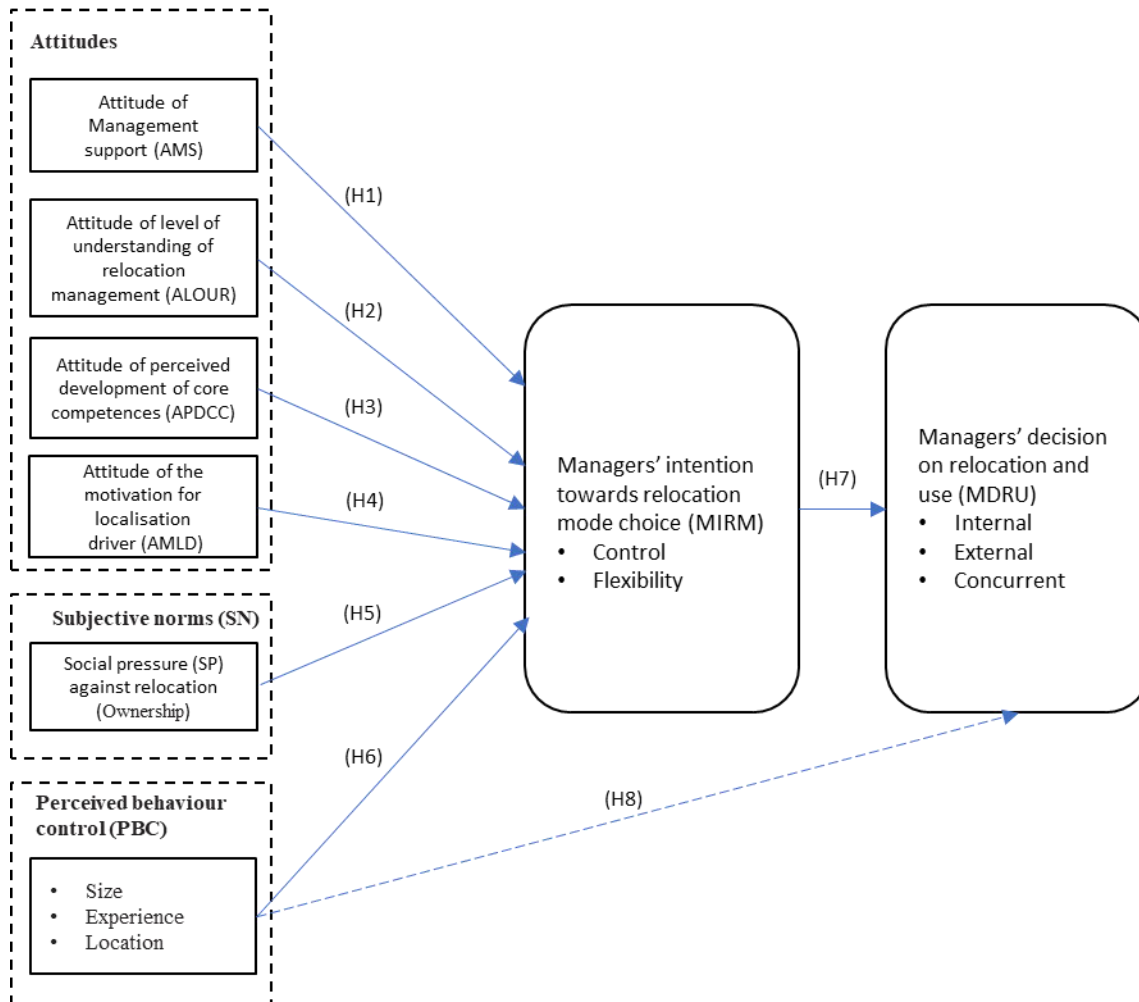


Figure 16 Research model derived from TPB

To understand better why one way of operating offshoring is preferable to another, it is important to first analyse the attitude of managers towards offshoring. Derived from the literature review, there is a wide selection of SCM management literature globally available on the driving forces behind relocation (e.g. (Benito, 2015; Cuervo-Cazurra et al., 2018; Cuervo-Cazurra & Narula, 2015; Derwik & Hellström, 2017; Kinkel, 2012; Lewin & Peeters, 2006; Maskell et al., 2007; Monczka et al., 1993; Roza et al., 2011; Van Hoek & Wagner, 2013)). According to this literature, the following intentions are the main factors that influence managers' decisions to outsource their work: localisation drivers such as market competitiveness factors, cost cutting and resource-seeking motivation, and the support received by the executive management, the level of understanding of the different tools and methods in a relocation process, and the perception on development of core competences.

4.5. The definition of components

For this investigation, eight constructs were identified to be used. To better understand the aims of the constructions and what they are intended to convey, this section offers generic definitions for each of the structures. All constructs in the setting of this research are to be examined within the SCPRM model. This requires using SCPRM processes, tools, and techniques to put plans into place and carry them out to manage relocation tasks along the supply chain and in the production, based on ongoing evaluations, classifications, and quantification, as well as the associated mitigation activities. The overall goal of all those elements is to make the supply chain and production less random while assuring continuity at a level that is economically viable for the supply chain and production relocation. The following definitions apply to the constructs employed in this study:

- 1) *Attitude of management support for SCPRM (AMS)*: the extent to which a person expresses happy or negative emotions (appraising effect) while discussing whether they have received enough managerial assistance, training, resources, time allotment, and encouragement to utilise a certain technique.
- 2) *Attitude of level of understanding for relocation management (ALOUR)*: the extent to which a person feels they have a sufficient grasp when employing a certain technique
- 3) *Attitude of perceived development of core competences (APDCC)*: the degree to which an individual is open in knowledge sharing to enhance core competencies to the firm's collective learning, connect various production skills, and integrate many technology streams.
- 4) *Attitude of the motivation for localisation driver (ALD)*: the extent to which a person expresses either good or negative emotions (evaluative effect) that identified intentions are leading drivers behind managers' offshoring decisions
- 5) *Social pressure (SP)*: the form of ownership (family owned versus family managed versus public enterprises) will be utilised as a representation for the subjective norm.
- 6) *Perceived behaviour control (PBC)*: in order to reflect capabilities (perceived behaviour control), the following company characteristics will be used: organisation size, global experience, and kind of relocation operation type.
- 7) *Managers' intention toward relocation mode choice (MIRM)*: the degree to

which a manager chooses control above flexibility, which is directly tied to the relationship between costs and benefits decreasing as a result of relocation activities.

- 8) *Managers' decision on relocation and use (MDRU)*: the degree to which a managers' decision is for “internal relocation operation”, “external relocation operation” or “concurrent relocation operation” and their use in the company.

4.6. Research hypothesis development

TPB is the foundation of the suggested theoretical model for this study. As a result, the research's stated hypotheses are in line with those presented in TPB. Since the literature explains the conceptual definitions of various market entrance options, it is vital to examine the relationship between perceived local core competencies and the firm's choice to relocate. Additionally, it is crucial to look at the connection between those elements and the manager's selection of relocation strategies, given that those criteria form the basis for this study. We may better comprehend the intricacy of the phenomena of DACH companies' relocation practises in China by looking at the relationship between these characteristics and the effect of the corporations. The goal is to maintain attention on the initial stages of the procedure throughout the assessment of the relocation mode, until the choice to carry out this process is made. As a result, a number of hypotheses are developed for this study.

Hypotheses for RQ1: Which perceived attitudes and behaviours affect strategic relocation practise intentions in DACH (Germany, Austria and Switzerland) companies in a relocation process to China?

4.6.1. Attitude of management support for SCPRM (AMS)

The supply chain literature places a strong emphasis on the significance of the management function (Hahn et al., 1990; Krause, 1999; Madhavaram et al., 2023; Monczka et al., 1993; Stevenson, 2012; Ward et al., 1994). Senior-level managers are more aware of the strategic needs of the company to maintain its competitiveness in the marketplace, and as a result, they have a better knowledge of the requirements of SCM and SCPRM processes (Hahn et al., 1990). Management must devote time, people, and money to helping the firm both within and outside, according to Monczka et al. (1993); for instance, vendors who are eager to participate in the company's supplier development programme and become a long-term partner. Two of the key responsibilities of management executives are overseeing the formation of organisational values and developing appropriate management styles to improve the efficiency and performance of the business.

Management should be aware of any potential competitive advantages brought about by relocation impacts (such as strategic purchasing and IT on efficient supply relationships), according to prior studies. According to earlier research, firms require management assistance for strategic procurement, the growth of supplier relationships, enhanced IT adoption, risk management, and the effective installation and administration of management systems (Hahn et al., 1990; Krause, 1999; Madhavaram et al., 2023; Monczka et al., 1993). Ajzen (1991, p. 183) claimed that "the resources and opportunities available to an individual determine, to some extent, the possibility of behavioural achievement". Knowledge management (Boynton & Zmud, 1984; Pennings & Harianto, 1992), organisational support (DeLone & McLean, 1992; Frau, 2023; Leonard-Barton & Deschamps, 1988; Monge et al., 1992) and user training (Frau, 2023; Fuerst & Cheney, 1982; Leonard-Barton & Deschamps, 1988; Raymond & Paré, 1994; Sanders & Courtney, 1985) are examples of institutional indicators that have been taken into account. Managerial commitment and encouragement is one organisational factor that has been frequently recognised in the research as having a significant impact on technology adoption in firms (Agarwal, 2000).

By examining the number of resources allocated to SCPRM, the intensity of management meetings devoted for SCPRM, the working out provided for SCPRM, and the recognition of senior leadership contributions to SCPRM practises, the attitude for management support (AMS) construct is operationalised in this study.

It is therefore possible to say that managers' intentions will commit to a lesser quantity of resources when their attitude is founded on relocation assumptions. In other words, managers' views about relocation are likely to lead them to pick the least expensive and labour-intensive offshore operating mode. Therefore:

H1a: Managers' attitudes grounded on management support (AMS) will privilege the intention to select external relocation operations versus internal relocation operations.

H1b: Managers' attitudes grounded on management support (AMS) will privilege the intention to select external relocation operations versus concurrent relocation operations.

H1c: Managers' attitudes grounded on management support (AMS) will privilege the intention to select concurrent relocation operations versus internal relocation operations.

4.6.2. Attitude of level of understanding for relocation management (ALOUR)

As a result of having a comprehensive knowledge and understanding of SCPRM practices, tools, and strategies, it is assumed that every SCPRM practitioner would need to acquire these skills in order to implement SCPRM effectively in practise. Research in various management and system usage sectors, including quality management systems or IT systems, has discovered that difficulties with standard and procedure interpretation or general concept comprehension are related to difficulties with system implementation and use later on (Abbott et al., 2013;

Lambert et al., 1998; Landin, 2000; Luo et al., 2013). In this study, the concept of attitude of level of understanding of relocation (ALOUR) is operationalised to address issues pertaining to knowledge of tools and procedures for efficient SCPRM practises, continuing relocation valuations and mitigation approaches, knowledge, judgement, and ongoing SCPRM scholarship. With a general knowledge and understanding of SCPRM practises, tools, and techniques, the attitude of level of understanding of relocation (ALOUR) was selected, which would require the SCPRM practitioner to have enough practice to use SCPRM in practice. Such systems, according to Magd and Curry (2003), are more successful to develop and operate because users have a better knowledge of the systems' intended uses. According to Ab Wahid and Corner (2009) "understanding" is essential to the efficient upkeeping of systems. As per Fui-Hoon Nah et al. (2001) business expertise and system expertise are crucial components in system deployment. The degree of system comprehension is crucial, as acknowledged by Yeung et al. (2003) and Theng and Wan (2007). According to Hall (1999), among other things, the company's abilities and assets include the knowledge that its personnel possess, giving it a comparative advantage in managing associated business operations. Because they have the necessary knowledge and abilities to handle hazards, organisations with highly educated and competent workers may see a reduction in risk (Smeltzer & Siferd, 1998). The attitude of level of understanding of relocation (ALOUR) is operationalised in this research to address issues with strategic knowledge of tools and methodologies for practical SCPRM practises, continuing risk evaluation and mitigation plans, know-how, decision-making, and ongoing SCPRM learning.

Self-control is more crucial than flexibility when businesses utilise relocation as a distinguishing strategy where quality and timeliness are crucial (Quinn & Hilmer, 1994). Moreover, as long as product quality is related to the selection of segments in the company's value chain, it includes a preference for superior functionality and core competences in this regard (Gan & Grunow, 2016). Thirdly, there might be concerns of knowledge leakage. At this point, external relocation businesses limit the benefits of such recognition since relocation companies are not directly involved in relocation activities abroad. Concurrent outsourcing may be a workable solution in this case (Parmigiani, 2007). Firstly, similar to the captive model, it aids in business adaptation to foreign conditions and local acceptance. The second benefit is that businesses may more effectively employ and organise their own resources with those of their vendor or subcontractors (Mols, 2010). Managers can use this option to meet their needs by balancing control and flexibility. Therefore, if management attitudes are focused on understanding relocation activities, their intention is very likely to use more advanced modes of operation in the surrounding area. This consideration leads to the following hypotheses:

H2a: Managers' attitudes grounded on level of understanding for relocation (ALOUR) will favour the desire to pick external relocation operations over internal relocation operations.

H2b: Managers' attitudes grounded on level of understanding for relocation (ALOUR) will favour the desire to pick external relocation operations over concurrent relocation operations.

H2c: Managers' attitudes grounded on level of understanding for relocation (ALOUR) will favour the desire to pick concurrent relocation operations over internal relocation operations.

Hypotheses for RQ2: What core competences influence managers relocation intentions and how interdependent are these competences?

4.6.3. Attitude of perceived development of core competences (APDCC)

Numerous journals and authors in the field of SCM (e.g. Derwik and Hellström (2017)) indicate the importance of core competence in Supply Chain Management. This is of interest in this study to build on functional and individual levels as a starting point. Behavioural competences have received little attention from a vast array of backgrounds, hence this study will incorporate other disciplines to further investigate the management and behaviour competence cluster (Thomas, 2014; Van Hoek & Wagner, 2013).

The development of core competences includes an openness to sharing knowledge (Cabrera & Cabrera, 2005). Knowledge sharing is perceived to act upon competence in different ways. This, as an analysis leads to logic explanations, reasons and the scientific deliberation on knowledge sharing practices for the development of core competences (Lagerström & Andersson, 2003). Perceived uncertainty in knowledge sharing affects people's trust in their judgments and actions (Choi & Cho, 2019). Precarious scenarios might include those where the likelihood of specific outcomes is unknown as well as those in which the results are either understood or unclear (Mitchell et al., 2018). If a technology or system that could aid in the development of core competencies and the reduction of risk is not used, is used improperly, or does not produce the desired results, it may cause harm to people, businesses, or social repercussions at large, taking into account its psychological, financial, physical, or social ramifications (Burton-Jones & Gallivan, 2007; Rosenzweig & Roth, 2007).

According to a research by Rottenstreich and Hsee (2001), even though an critical incidence is unlikely to happen, it nonetheless has the potential to overwhelm individuals. Research on lay danger studies on risk perceptions and lay information sharing (Fischhoff et al., 1978; Riege, 2005) have demonstrated that two "subjective aspects of risk" may fairly predict worries about technical dangers, potential knowledge-sharing barriers categorised in three main domains of recently published works: individual/personal, organisational, and technological barriers. These dimensions recapitulate many individual factors of perceived development and knowledge sharing, including perceived risk. They might be viewed as indicators of the degree of uncertainty around knowledge sharing and the degree to which it raises anxiety. While the latter captures an expression of resistance to ambiguity and so indicates intellectual or cognitive

elements of worry, the former captures a knowledge-sharing capacity to trigger an intuitive reaction. By doing so, these dimensions are moved from the realm of prediction to the realm of prescription, from predicting how users would react to technology to prescribing how they should be created, put into use, or utilised themselves (Fischhoff et al., 1978).

Conflicting evidence from the literature suggests that managers could both underestimate and overestimate the effect of changes in relocation activities that have a low probability but a large impact (Pedersen, 2013). Managers might gain from having a deeper awareness of how to enhance fundamental competencies while avoiding potential biases and vulnerabilities. One of the main issues with managing various activities, systems, and technologies is the difficulty of managing and implementing changes in the supply chain (Squire et al., 2009). In the context of this study, it is presumed that perceptions of development and knowledge sharing will have a direct impact on how valuable a system or technology—in this case, SCPRM—is regarded to be and how much attention it receives. The item scales from different sectors of perceived development and knowledge sharing that have been updated to incorporate questions about perceived development of core competencies (PDCC) are included in the operationalisation of this construct: According to Yoo (2014), perceived development and information sharing can lead to emotions of unease, discomfort, or anxiety as well as worry or psychological discomfort (Bray, 2008), nervousness (Taylor, 1974) and cognitive dissension (Garner, 2013; Gemuenden, 1985). Regarding relocation experiences and people's apprehension about them, attitudes about the perceived development of core competencies toward SCPRM activities are assessed.

In order to focus on a company's core competencies, it may be necessary to externalise activities that are "nonessential," or it may be necessary to look for resources or capabilities that are "necessary" to gain a competitive advantage (Nujen & Halse, 2017). As a result, the decision to use internal relocation operations or external relocation operations will be influenced by one of these two factors. Concurrent relocation operation choices appear to be a middle ground in this case, so:

H3a: Managers' attitudes grounded on perceived development of core competences (APDCC) will favour the desire to pick external relocation operations over internal relocation operations.

H3b: Managers' attitudes grounded on perceived development of core competences (APDCC) will favour the desire to pick external relocation operations over concurrent relocation operations.

H3c: Managers' attitudes grounded on perceived development of core competences (APDCC) will favour the desire to pick concurrent relocation operations over internal relocation operations.

4.6.4. Attitude of motivation for localisation driver (ALD):

It is crucial to examine managers' views on relocation in order to better understand why one kind of outsourcing is favoured over another. The factors that influence relocation are extensively covered in the global management literature (Benito, 2015; Cuervo-Cazurra et al., 2018; Cuervo-Cazurra & Narula, 2015; Kinkel, 2012; Kinkel & Maloca, 2009; Lewin & Peeters, 2006; Maskell et al., 2007; Roza et al., 2011). These papers identify the following main objectives: cost savings, market competitiveness factors, resource seeking motivations and industry practices are key drivers behind managers relocation decisions.

Cost savings have traditionally been considered the main motivation for relocation (Größler et al., 2013; Kinkel, 2012). According to a thorough analysis of relocation operations conducted by the Offshore Research Network, the majority of Western corporations migrate largely to cut labour expenses and avoid other immediate costs (Lewin & Peeters, 2006). Managers can save labour expenses by relocating, both for low-skilled workers and for highly trained workers in developing nations.

Relocation also provides ways to increase the market competitiveness. In this regard, research indicates that product and service relocation and outsourcing should be an essential component of a company's overall business strategy (Jensen & Petersen, 2013; Linder, 2004; Pedersen, 2013). Businesses in an increasing number of industries are starting to use the geographical diffusion of their activities along the value chain to gain and keep a competitive advantage in new markets, enhance product quality, speed up response times, and for strategic reasons as global competition heats up (Buckley & Ghauri, 2004; Gerbl et al., 2016; Mudambi & Venzin, 2010).

While exploration will grow the search for and experimentation with new sources, frequently based on technology upgrades (Meyer et al., 2009), resource seeking intention primarily concerns the efficiency, usage, and enhancement of present capabilities. The company should concentrate on targeted, high-value initiatives related to its essential assets and body of expertise. By restricting the breadth of their internal value chains, external relocation operations enable businesses to concentrate on their core competencies. By outsourcing, they may concentrate on raising the standard of their own operations and skills. Managers may deploy more resources, including money and people, by contracting out secondary or supplementary tasks to overseas partners. This will help employees become more specialised via increased learning and shared experience (Alexander & Young, 1996).

Industry practices are considered to be a key justification for relocation efforts (Lewin & Peeters, 2006). Companies frequently follow industry or competitor practices and only implement relocation measures in response to counterfeiting efforts (Do et al., 2022). Numerous businesses across a variety of industries employ external outsourcing operations (Lewin & Peeters, 2006; Lewin & Volberda, 2011; Pla-Barber et al., 2019; Rodríguez & Nieto, 2016). The internal relocation approach was initially favoured by businesses over the external

relocation concept. However, over time, this tendency has changed to favour external relocation models (Lewin & Volberda, 2011), therefore:

H4a: Managers' attitudes grounded on understanding of the localisation driver (ALD) will favour the desire to pick external relocation operations over internal relocation operations.

H4b: Managers' attitudes grounded on understanding of the localisation driver (ALD) will favour the desire to pick external relocation operations over concurrent relocation operations.

H4c: Managers' attitudes grounded on understanding of the localisation driver (ALD) will favour the desire to pick concurrent relocation operations over internal relocation operations.

Hypotheses for RQ3: What factors influence the decision of operation modes between family managed, family owned and public companies in the beginning of a localisation process? What tested relationship paths exist?

4.6.5. Social pressure (SP):

In accordance with the research model displayed in figure 14, the use of type of ownership (family businesses versus non-family businesses) as a proxy for the subjective norm will be used. Compared to non-family enterprises, negative societal pressure against relocation is felt more strongly in family businesses. In addition, family companies tend to be more conventional than other types of enterprises (Boellis et al., 2016; Pukall & Calabro, 2014). Their decisions are heavily influenced by their emotions (Musteen, 2016). Owners frequently have a strong emotional connection to their business since it is an important component of their own enjoyment and family tradition. By clearly identifying consumers, channels, and other stakeholders from a long-term perspective, they want to assure the company's viability for the next generation in addition to increasing revenues (Venohr & Meyer, 2009). Family companies are therefore less likely to employ relocation usage analysis. Managers are less willing to cede control to other parties since the danger of an opportunistic threat and loss of prestigious capital is larger if they leave compared to captive relocation (Pukall & Calabro, 2014), therefore:

H5a: Social pressure (SP) will favour the desire to pick external relocation operations over internal relocation operations.

H5b: Social pressure (SP) will favour the desire to pick external relocation operations over concurrent relocation operations.

H5c: Social pressure (SP) will favour the desire to pick concurrent relocation operations over internal relocation operations.

4.6.6. Factors influencing the perceived behaviour control (PBC):

Much research has been conducted into the variables that affect the manner of relocation (Elia et al., 2014; Hutzschenreuter et al., 2011; Larsen et al., 2012; Mudambi & Venzin, 2010; Nieto & Rodríguez, 2011; Nordigården et al., 2014; Roza et al., 2011), several of them focus on demographic issues, such as company size (Fritsch & Meschede, 2001; Moreno & Casillas, 2007), social capital (Balachandra & Friar, 1997) and R&D activities (Becheikh et al., 2006; Raymond & St-Pierre, 2010), while others target company behaviour, such as entrepreneurial attitude (Hult et al., 2004; Lumpkin & Dess, 1996). Nevertheless, aspects related to corporate behaviour are crucial for the development of high-technology enterprises, supporting the knowledge-based perspective and resource-based view (Dai & Liu, 2009). These elements have a direct impact on a company's interpersonal relationships, networking potential, and capacity to explore and seize new possibilities (Peng, 2005).

Location

The risk that conducting business may become more unpredictable as the distance between the home country and the target country rises is taken into account in all research in this sector (Ojala, 2015). It is critical to minimise uncertainty, particularly for small and medium-sized organisations, because they continually hold the inferior position both in the domestic and global marketplaces, as well as inside their respective industries. These companies should carefully examine distance as a decision factor in their worldwide growth in such circumstances (Gorecki & Conlon, 1986). Psychological remoteness is also significant in this scenario. Additionally, a closer distance to the chosen markets means cheaper transit costs for international trade.

Therefore, location is a crucial issue that allows corporations to achieve comparative advantage within the antiquated internationalisation method. However, because it is part of the traditional strategy, the location is not as important. Some studies even assert that it has little bearing on a company's internationalisation strategy (Dow & Karunaratna, 2006; Granstrand, 1999; Jolly et al., 1992; Yeung et al., 2003; Zhang et al., 2023). This can be as a result of the niche market being the only market that the world is focused on. Today, businesses may cut their shipping costs and make it easier to engage with their customers wherever they may be in the world, owing to the merging of domestic and overseas markets and the growth of technology. This implies that multinational corporations may be prepared to use cutting-edge technology and other advantages to counter the "location disadvantage" (Berthou & Vicard, 2013). Supported by the discussions above, it will be hypothesised that relocation firms are affected by their locations.

Size

The sizes of conventional internationalised enterprises is another important consideration. A typical conventional internationalised business typically has a solid domestic foundation, as Rennie (1993) notes. It has a robust product portfolio, excellent technical talents, and a well-established core business. Without building a solid foundation in the domestic market, it would not begin to concentrate on the global market through export. When major businesses decided to engage in worldwide commerce, many of them followed several similar models, such as Uppsala. However, in order for small and medium-sized businesses to expand internationally, they must integrate themselves into the global market from the beginning. These businesses see overseas markets as opportunities to explore and learn new things (Liu & Li, 2022). When global enterprises begin to engage in worldwide commerce, their size is significantly less than that of conventional, often bigger firms. because they haven't had enough time to increase their size in the local market. So, it follows that relocation firms are affected by their size.

Experience in relocation:

Finally, as an authoritative representative of capabilities (control of perceived behaviour), some characteristics of the company (international experience & activity type) will be introduced. Large, knowledgeable businesses have simple access to resources and information on internationalisation. Therefore, it is simpler for these businesses to complete more difficult relocation tasks, such as internal or concurrent relocation operations (Contractor et al., 2010). Experience and seniority of peer members are playing a role as well in how relocation practitioner perceiving their risk adversity (Teece, 2007; Xu et al., 2022; Yang et al., 2010). Similarly, depending on the type of relocation activity, the ease of action or perceived difficulty. Research and development, product design, manufacturing, and buying are all considered production activities. Marketing, sales, and after-sales operations are all considered commercial activities. Finance, IT, and supervision are examples of administrative activities. The majority of managerial tasks are at the core of business operations. These jobs have always been seen as being more challenging to relocate abroad. When firms use these tactics, they tend to control them through internal offshore operations. However, it is clearly recognized that productive and commercial activities can be easily moved abroad, whether internal or external. Manufacturing enterprises in particular face high expenses connected with activities that are directly tied to the production process (manufacturing activities), and most managers are more willing to relocate their businesses abroad. Administrative tasks are employed excluded in this study paradigm, therefore:

H6a: PBC (size, location and experience in relocation) will favour the desire to pick external relocation operations over internal relocation operations.

H6b: PBC (size, location and experience in relocation) will favour the desire to pick external relocation operations over concurrent relocation operations.

H6c: PBC (size, location and experience in relocation) will favour the desire to pick concurrent relocation operations over internal relocation operations.

H8: PBC (size, location and innovation) is positively related to subsequent entrepreneurial relocation behaviour, over and above its mediated effect via intention.

4.6.7. Managers intention toward relocation mode choice (MIRM):

To carry out certain behaviours or to obtain specific results, one must have an intention (Triandis, 1979). Within other aspects, the motivating elements that influence behaviour are thought to be described by intents (Ajzen, 1991, p. 181). A declaration of something (such as, "I plan to perform X!") choosing a behaviour or target intention frequently signifies the conclusion of decision-making and shows the amount of work that an individual is willing to do in order to obtain desired results (Ajzen, 1991; Ajzen et al., 2009; Gollwitzer, 1990; Webb & Sheeran, 2005). In their analysis of the many ways that intentions are assessed, Warshaw and Davis (1985) distinguished between measures of behavioural intentions (e.g., "I intend to engage in behaviour X") and measures of self-predictions (e.g., "How probable is it that you will engage in behaviour X?") (as cited in Armitage & Conner, 2001). Morris and Dillon (1997) and Suh and Han (2003) both found scale items to measure how strongly people intended to utilise technology in the future. The item scales were changed to meet the context of this study and borrowed from Francis et al. (2004) for the purpose of this research.

International entrepreneurship stresses actions linked to brokering, using or growing resources, producing value, and pursuing opportunities, as stated in the literature review chapter. For these initiatives to be successful, businesses must embrace cutting-edge, proactive, and risk-based behaviours (Shrader et al., 2000). It also implies that all international activity is business, because it only took place in the course of intermediation and indebtedness (Zhang et al., 2009). Compared to traditional internationalised companies, entrepreneurship is more important in native global companies. In research on internationalisation, it has been discovered that the importance of business behaviour is the most prevalent factor (Andersson & Evangelista, 2006; Knight & Cavusgil, 1996; Madsen & Servais, 1997). As Zhang et al. (2009) argue, this opportunity is especially useful for native global companies, as these companies lack material, financial and human capital resources. In addition, entrepreneurship may also help them make better use of their limited resources. This increases the potential for a global company from a variety of angles, including "potential for global networking," "potential for invention," "potential for marketing," and "ability to take risks." Since international entrepreneurial capacity "provokes interactions between the elements of the company in the process of discovery, realisation, evaluation, and exploitation of opportunities in the exterior" (Zhang et al., 2009, p. 296), these perspectives are crucial for clustering the core competencies of the company's entrepreneurial capacity. Therefore:

H7: Entrepreneurial intention for relocation is positively related to subsequent entrepreneurial behaviour for Managers decision on relocation (MDRU)

4.7. Chapter conclusion

This research intends to create a modified model for consciously recognising managers' engagement behaviour in operational modes and relocation decisions. This model is based on the TPB model (Ajzen, 1991). Since it is seen to be the most relevant of the available models / principles in the area of analysing behaviour intentions, Ajzen's model is one of the foundations of a theoretical model. Throughout the mapping analysis and construction, the following external factors were identified: Attitude of management support for SCPRM (AMS), Attitude of level of understanding for relocation management (ALOUR), Attitude of perceived development of core competences (APDCC), and Attitude of Localisation driver (ALD). All such factors were then applied in anticipation of behaviour influence like attitude, subjective norms, and perceived behavioural control. Eight research hypotheses have been created as a consequence, and they are based on significant functional connections found in the theoretical model. The research methodology is outlined in the next chapter. A pilot study is conducted to evaluate the sufficiency and reliability of the questionnaire questions prepared to correspond to the components for this study in order to test the hypotheses. The purpose of the pilot study was to check if the chosen items match with the constructs they were meant to test.

5. Methodology

An outline of the research paradigm and philosophy applied to this study is provided in this chapter. It goes on to discuss how the chosen research methodology and the research tools used for this study, which were generated from the literature review. Following that, it briefly addresses ethical issues and the justifications for the proposed pilot research. An overview of the survey questionnaire and the method for gathering data for this study are given in this chapter. It emphasises the factors taken into account while creating the self-administered online surveys and the sample technique. The statistical techniques used for this investigation are described and justified at the end of this chapter. It considers methodological problems typically connected to quantitative measurements and the steps taken to contain them. Figure 17 provides a schematic summary of key parts in this chapter.



Figure 17 Schematic overview of key elements of methodology chapter

5.1. Introduction and research purpose

The research methodology is based on a theoretical perspective within a philosophical position, which provides context for the process and its logical criteria, a lens through which research is seen (Creswell, 2013). Such philosophical positions are often referred to as research paradigm or worldview (Creswell, 2013; Hallebone & Priest, 2009). Kuhn (1970) introduced the concept of paradigm to describe the basic theories and beliefs that link several researchers through the common foundation for their research. Researchers with different worldviews might have difficulties in understanding and communicating with each other and explaining what they are doing to others. This paradigm sets the border for the whole research process, it influences the methodological issues as well the more practical matters. A possible explanation for the term paradigm may be defined in Bogdan and Biklen (1998, p. 22) as “a loose collection of logically related assumptions concepts or propositions that orient thinking and research”. For Bryman (2004, p. 453), a paradigm is “a cluster of beliefs and dictates which for scientists in a particular discipline influence what should be studied, how research should be done, how results should be interpreted”. The term "paradigm" is defined by MacNaughton et al. (2001, p. 32) to mean a view about the nature of knowledge, a methodology, and criteria for validity. The approach to research involves different philosophical assumptions, all of these philosophies, even the newer ones, can be categorised according to their ontology, epistemology, and their methodology. Similar consistencies in the philosophical assumption, for example explored by Guba and Lincoln (1994), are discovered by different researchers.

Involved with the nature of reality is ontology. This calls into question the convictions held by researchers to specific points of view as well as their presumptions about how the world works.

Positivism sees reality as true and the external independent. From the perspective of the natural scientist, positivism allows them to draw conclusions such as generalisations (Saunders et al., 2009). A positivist ontology is therefore the epistemic stance that supports utilising a visible social reality. These exist in the spectrum of only one truth. In order to promote replication, a highly organised technique is prioritised. In contrast to the understanding of social research, which seeks to explain reality using different perspectives to describe human behaviour, with external subjective views creating difficulties to explain such complex realities within culture, language and multiple meanings.

For the epistemology component the difference is in the recognition of naturalistic or academic procedures in understanding social phenomena (Creswell & Poth, 2017). What creates knowledge, e.g. in positivism in the form of general laws, is in the view of the interpretivist based on people's behaviour in creating an understanding of their situation (Kazi, 2003). However, nothing is black and white, there is in between an alternative perspective to understand the influences of structures of the members involved in social relations (May, 2001).

The third component, methodology, defines how the research process collects the data required by the researcher's selected paradigm, which offers qualitative, quantitative or mixed methods. As explained before, in the term of ontology and epistemological, the researchers philosophical view of both categories leads to certain methodical methods. (Bryman et al., 2008).

Operating in a research paradigm includes reflection on practical and ethical implications of the chosen research strategy. This impacts on time and resources, which have an impact on data sampling, data generation and analysis, influencing the researcher's view of their preference of ontology, epistemology and methodology.

5.1.1. Research purpose

For most research studies three common purposes exist, namely exploratory, descriptive and explanatory (Sekaran & Bougie, 2016). Exploratory research is used to clarify the research question and frame the research problem in the context of a particular area of expertise in the assessment of phenomena by reviewing the literature and conducting exploratory interviews (Saunders et al., 2009). Imagining the characteristics of the variables related to the study's problem is the goal of a descriptive study (Sekaran & Bougie, 2016). Since there is no requirement to create a shape for the phenomena, a descriptive research study would not be appropriate for this project. Additionally, as the variables' characteristics have previously been thoroughly established in the literature, they do not require further explanation. The focus of an explanatory research study is on establishing links between variables and illuminating how these patterns might be used to monitor a situation or solve a problem. Explanatory (hypotheses testing) is the project's main goal in this study; it aims to detect the connection between real behaviours (uses) in the context of TPB theory. As Robson (2002) emphasises, there could be

more than one goal for this study because the beginning of the investigation might change through time. Saunders et al.'s (2009) argument is in favour of the idea that there could be additional purposes. Additionally, several aspects of this research involve exploratory functions, particularly when examining the primary variables that influence the use of relocation models and further main factors of the cluster of core competences.

5.2. Research paradigm and philosophy

If the approach is going to start with a theory developed from academic literature, the researcher uses the deductive approach to link the philosophy together. On the other hand, the inductive approach fits if the approach is to explore how things are practised, lived, and interpreted, to build up a theory of the phenomenon (Saunders et al., 2009).

Ticehurst and Veal (2000) support this linkage between a quantitative approach and positivism by stating that the quantitative approach to research is also known in management science or operations research, therefore, linking disciplines with philosophy. They argue that quantitative and qualitative methods are linked to positivism and interpretivism epistemologies, as shown in their diagram in Figure 18.

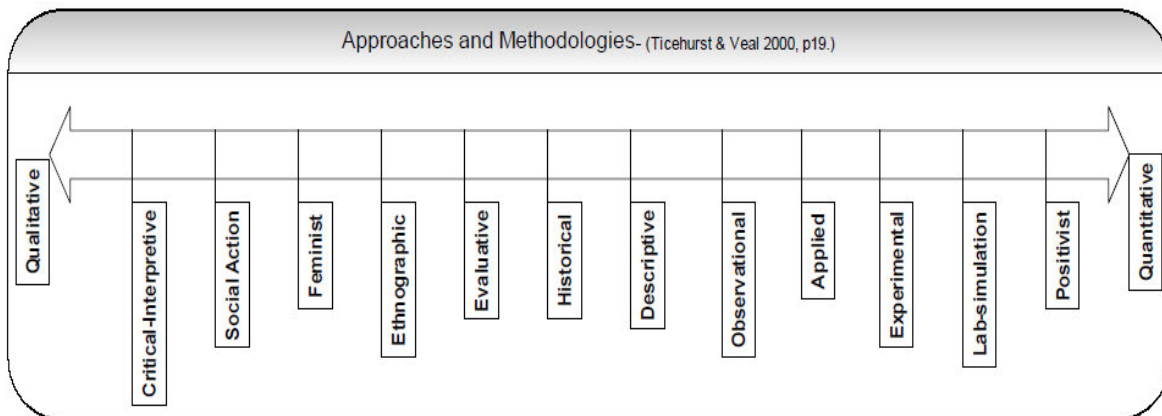


Figure 18 Approaches and methodologies
Source: Ticehurst & Veal, (2000)

The overarching goal of all paradigms, regardless of how many there are, is to better understand the behaviours of individuals, groups, and organisations and to examine how they interact. Numerical data collection through quantitative methods are associated with the positivist approach whereas verbal or textual data or qualitative methods are traditionally linked with phenomenology (Iacono et al., 2009). According to Stiles (2003), positivist methods frequently employ questionnaires for data collection and statistical analysis techniques, such as random sampling and hypothesis testing. For the phenomenological approach favouring verbal data, the approach is to develop the meaning from the perspectives of participants. In Table 12, a summary of the different features from those paradigms is provided:

Positivist (objectivist) paradigm	Phenomenological (subjective) paradigm
Uses large sample size	Uses small sample size
Researcher does not get involved in problem domain	Researcher gets involved
Data is specific and more precise	Data is rich and subjective
Concerned with testing hypothesis	Concerned with developing theories
Generalizes from sample to population	Generalizes from one setting to another

*Table 12 Features of different paradigm
Source: Collis and Hussey (2014)*

Easterby-Smith et al. (2004) highlighted that the relationship between research philosophy and research methods is an important one, in order to make more informed decisions about the research approach, decisions about which methods are appropriate for the piece of research, and to be aware of constraints which may impinge on the research. Mackenzie and Knipe (2006) referred to the research process as a journey and provided a sequential overview of actions undertaken in research studies. The following summary (Table 13) serves as orientation to depict the steps and decisions taken by a researcher to situate paradigms, methodology and data collection tools within the three different paradigms. This study follows the steps of the positivist paradigm displayed in Table 13.

	Positivist	Interventionist	Constructionist
Philosophy	positivism	interpretivism	interpretivism
Approach to theory development	deduction	induction	induction
Methodological choice	quantitative	qualitative	qualitative
Strategy	survey	action research	case study
Time horizon	cross-sectional	longitudinal	cross-sectional

Table 13 Overview of different research paradigm

5.2.1. Quantitative versus qualitative

The distinctions between quantitative and qualitative research methods are outlined in Table 14:

Element	Quantitative	Qualitative
Principal orientation to the role of the theory to research	Deductive Testing of theory	Inductive Generation of theory
Ontology	"Reality is real and apprehensible", Objectivism	"Reality is "real" but only imperfectly and probabilistically apprehensible, so triangulation from many sources is required to try to know it", Constructionism
Epistemology	"Findings true-researcher is objective by viewing reality through a "one way mirror", Positivism	"Findings probably true-researcher is a "value-aware" and needs to triangulate any perceptions he or she is collecting", Interpretivism
Common Methodologies	"Mostly concerns the testing of theory. Thus, mainly quantitative methods such as: surveys, experiments and verification of hypotheses"	"Mainly qualitative methods such as case studies and convergent interviews"

Table 14 Quantitative and Qualitative research approaches

Source: adapted from Guba and Lincoln (2005), Saunders et al. (2009, p. 119) and Hallebone and Priest (2009)

Given that the choice to use a positivist paradigm for the current work has been taken, a quantitative technique has been used to accomplish the purposes and the study's goals. Essentially, it is planned to conduct a field survey by using a self-administered questionnaire to gather the data for the current work. Data was collected on aspects including: behavioural intentions, expectation of effort, facilitating conditions, motivation, performance anticipation, perceived behaviour controls, social pressures, and their intended behaviour (Myers, 2019). As a result, the data used in the current investigation is more quantitative than qualitative.

5.2.2. Induction versus deduction

When choosing a methodology, care must be taken to determine if the research will involve the application of previously acquired information in a novel setting (deductive) or the exploration of something novel. The former is concerned with gathering knowledge about diverse viewpoints on a social issue (Yin, 2009). According to Saunders et al. (2009), an inductive investigation should ultimately result in a theory or framework by having the scientist look for patterns in empirical reality that lead to general inferences that make it easier to conceptualise a theory or framework. The theory or framework may not be general because such interpretations are formed from a certain perspective instead of being contextual. Nevertheless, some researchers may choose to use data of a heterogeneous character in order to aid generalisation (Collis & Hussey, 2014). A key goal of inductive research is to go from specific findings to broader hypotheses and generalisations. Deductive studies, in contrast, use a more limited perspective and concentrate on the particular and facts (Saunders et al., 2009). According to Creswell's (2013) work, one of the biggest noticeable differences between

deductive and inductive research in this regard is the use of pre-existing theory and literature. As per Creswell (2013), the deductive method focuses on theory-testing, which means that literature is taken into consideration in order to establish interrelationships and questions to be raised before data is collected. This study falls under the category of deductive research, as further supported by Creswell (2013). In the current study, there is a conceptual idea of the framework in accordance with TPB model, as debated in the literature. The concept is then put to the test in the perspective of relocation operations activities of high technologies to China.

5.2.3. Exploratory versus confirmatory

It is evident that most social science research uses both confirmatory and exploratory methods (Gerring, 2001). Confirmatory studies, are typically used when researchers want to test pre-specified relationships in order to further validate them (Taherdoost, 2018). In contrast, exploratory studies are typically used when researchers want to define potential relationships in their most general forms in order to facilitate a range of methods to forecast the linkages that will emerge (Saunders et al., 2009). To put it another way, when performing an exploratory study, researchers are not looking to confirm associations that have already been established before analysis, but rather to use the technique and data to define the relations between the variables of the model, and the kinds of such (Hair et al., 2007).

To maintain sensitivity to the evidence under examination, researchers frequently use the exploratory technique and are transparent about their theories, studies, and hypotheses. Discovery is the method's main objective, concentrating on enhancing the coherence of the theory and the evidence (Gerring, 2001). In addition, exploratory research may be seen as being inductive in nature, which has a number of advantages, such as freedom when it comes to formulating hypotheses without needing any evidence to back them (Myers, 2019). Nevertheless, this research method causes problems with the results of overfitting and is closely linked to bias. However, conversely, confirmatory studies rely on deductive approaches and statistics, as recognized by Myers (2019), which are first outlined and then tested with a hypothesis in terms of providing answers to specific questions.

In general, this serves to rationalise why the confirmation method is preferred when completing the analysis (Gerring, 2001). Although this research project adopts a quantitative, deductive approach along with hypothesis testing, it also employs a descriptive approach, whose objective is to establish links between the main factors that influence the behaviours and intention detecting of managers for relocation decisions and operations modes.

Despite this, the study also provides room for interpretation in aspects of the exploratory inductive method, which begins with empirical data of the specific phenomenon before moving on to an abstraction level theorisation, generalisation, and the confirmatory deductive method in the testing of theories' hypotheses (Queirós et al., 2017). As a result, there are some exploratory objectives in several areas of this study. This is particularly evident when

examining the important variables affecting the attitude for the intention of relocation in SCPRM.

5.3. Research Design

5.3.1. Proposed research methodology for this study

The positivist paradigm places the researcher in the role of a neutral observer as they watch the investigation domain continue to be untouched by the problem area (Saunders et al., 2009). When a method and an appropriate group of research techniques are combined to meet research questions and/or hypotheses that are posed to investigate social phenomena, a research design becomes crucial (Wahyuni, 2012). According to Simon (1980), the methods for gathering, analysing, and interpreting data as well as their application have a significant impact on the development of knowledge. Before developing quantitative theories, according to Creswell (2013), it is necessary to first comprehend the variables assigned to a trait or elements of a person or organisation that may be quantified or observed and that this differs among the people or organisations being studied. This variance means that results in a given situation fall into at least two mutually exclusive categories (Thompson, 2006).

Most researchers keep an objective eye on the issue throughout this procedure in order to complete their study. As a result, the problem domain does not have any impact on the researcher (i.e. SCPRM). This viewpoint is consistent with the realism methodology used for this investigation. The assertion made by Tharenou et al. (2007) that assessment methods are suitable for these metrics is consistent with that of other researchers. In accordance, Creswell (2013) acknowledged that the quantitative technique is best suited to research issues which arise in order to find elements that impact a result and to test a hypothesis in order to meet the established study objectives.

Wahyuni (2012) suggests the beginning points for developing a research design are the study objective and research questions, since they offer crucial hints regarding the subject that scientists are seeking to analyse (Berry & Otley, 2004; Saunders et al., 2009; Yin, 2011). The value of an intervention, determining the best predictors of results, or testing a hypothesis or explanation are all problems that are best addressed using a quantitative approach, according to Creswell (2013). This strategy is appropriate for the study's planned goals and objectives. The research plan for this study is a cross-sectional survey methodological technique. Other approaches were examined, but they were deemed inappropriate for a number of reasons, including the study's economics, the lengthy time needed and the restricted access to participants.

5.3.2. Research instruments

To gather primary, quantitative data, a variety of survey methods can be utilised, including phone surveys, in-person interviews, postal surveys, and electronic surveys. In recent years, postal surveys and electronic (online) surveys have seen the most use. Aguinis et al. (2009) conducted a content analysis on 193 papers from the first ten editions of *Organizational Research Methods*, which were published between 1998 and 2007. Surveys, which account for around 32.35% of all quantitative research designs, were found to be the most popular. There are many ways to conduct surveys and a number of distribution channels, each with advantages of their own. Following is a list of a few of these ways (Hair et al., 2007; Saunders et al., 2009):

- Written Surveys
- Surveys sent by mail
- Group Administered Questionnaires
- Drop-off Surveys
- Oral Interview Surveys
- Electronic or on-line Surveys

According to Pinsonneault and Kraemer (1993), surveys that are conducted with research goals have three unique qualities. Obtaining quantitative descriptions of a certain feature of the study population is the primary objective of a survey. A research survey may put a lot of emphasis on describing results to a predetermined demographic or on interactions between variables (Glock & Bennett, 1967). A quantitative-approach survey research requires standardised data from and/or about the subjects being investigated. The subjects under study might include missions, applications, or systems, as well as people, groups, organisations, or communities. Subjects are often questioned using organised and planned questions as the main method of data collection. Their responses, which may refer to one of the research units or themselves, serve as the data for analysis. The data is often collected on a small portion of the research population, denoted as a sample, but it is done in a way that makes it possible to extrapolate the results to the total sample. Large enough samples are frequently required to facilitate in-depth statistical analysis. The sample strategy needs to be carefully planned because the goal of such studies is to be able to generalise the findings to the entire population.

The perfect scientist, according to the positivist paradigm, is one who is non-interactive and objective. The researcher should make an effort to act objectively, documenting observations without getting personally engaged or endorsing any perspective (Hallebone & Priest, 2009). This kind of research methodology should be carried out in a way that convinces readers of the research both that the research results are accurate and that they can be duplicated. This indicates that findings must be able to be accepted or rejected by other people and that a basis and an alternative must be established, defined, and stated. It also suggests that the same

research settings must be pursued. Glanz and Rimer (2005) found that a key area of social psychology is the application of theory as a methodical approach to understanding events, behaviours, or circumstances. In this study the selection of the research instrument in combination with the questionnaire design is a key aspect to collecting the required results.

5.3.3. Research instrument proposed for this study

A self-managed electronic mail survey was used as the research instrument. If collected data may also be sponsored by certain institutions, it is also intended to conduct a more thorough inquiry (for example: audit firms, government institutions, professional export companies). The self-managed e-mail approach was created with this in mind, since it makes use of one of the most widely used methods for gathering information on social behaviour (Ziegler, 2006). Finding directory listings of specialised clusters connected to the target population was proposed as a good strategy by Dillman et al. (2009). The researcher utilised a list provided by the DACH departments of statistics and/or the accounting and corporate regulatory body based on this suggestion to gain access to the relevant firm data and contacts.

Since the target audience is defined by international cross border communication and English is a pre-requirement in their job descriptions, the online survey will be executed in English. In fact, due to the globalisation and mixed members of the sourcing teams and senior executive (it is highly likely that some of the participants are no German speaker), all native local languages of the participants are impossible to translate since the survey is anonymous. Considerations to keep survey in an accurate basic English are done with supply chain experts, as well as professional proofreaders. Reviewing the survey with non-native speakers can help to catch any issues to avoid any unbiased language (Dillman, 2011). A review of it was done with some participants of the pilot study.

Basic email addresses like info@xyz.com should be avoided if you want to reach the target audience. To be more suitable, personal e-mail addresses should be used. As recommended by Chung et al. (2015) to increase the return rate, techniques such as email reminders, direct phone calls and personal visits support this approach. The researcher's network and access to customer databases in the current company allow the researcher to be more specific and act as a starting point. Ethical considerations of using proprietary information held by the company are judged within the company. There are 1500 active customers in this database for the DACH region. The intended population is senior staff members such as Management Representatives, Assistant Management Representatives and/or Operations Managers. The goal of using a pilot study before carrying out the major investigation is explained in the next part, along with some analysis.

5.3.4. Establishing a measurement scale

A questionnaire is created to have an appropriate approach for gathering data to measure the variables described in the modelling approach in chapter 4.4, as a result of choosing an email survey as the primary data collection technique. Below, favourable justifications are considered and adopted.

When the number of scale points falls below five or rises over seven, data from Likert items are verified to be considerably less reliable in the study literature (Johns, 2010). As a concern brought up by Finstad (2010), for an electronically-distributed survey with 5-point Likert items, the practical implication might not be able to adequately capture data. For this research project an adaption of existing measurement scales with 7- point Likert was used. This lessens the likelihood of problems while demonstrating the reliability and validity of the new measurement ranges. Instead of beginning to design your own measuring scale, Cavana et al. (2001) advised using tools that have previously been shown to be reliable. For established theoretical models, scale measurements are frequently created by adapting questionnaires from literature-based research publications (Hair et al., 2007).

By adopting and modifying questionnaires from previously published journals in the IS sector, scales measuring the components contained in the theoretical model might be created. To provide operational definitions for each of the seven components in the conceptual model of this research, the original transcripts of IS investigations applying the technology acceptance theories and models were studied.

5.4. Research Questionnaire

Closed-ended questions and a self-administered email survey with a cover sheet were both employed in this study's questionnaire. The survey included sections intended to elicit feedback on the variables pre-set in the theoretical study model. Furthermore, data on the business and responders were gathered.

The closed-ended, self-administered questionnaire used a seven-point Likert scale with equivalent intermediate scales, ranging from strongly disagree (1) to strongly agree (7). Cox III (1980) evaluated a range of research that examined the validity and dependability of rating scales as well as the results of employing various numbers for answer categories in response models (Cicchetti et al., 1985; Matell & Jacoby, 1971; Schutz & Rucker, 1975). Likert scales, rating scales, and other measurements of attitudes and opinions often have five to seven response categories (Bearden & Netemeyer, 2011; Bearden et al., 1993; Peter, 1979; Shaw & Wright, 1967). Symonds (1924) was the first to propose dependability with seven answer categories (Ghiselli, 1955). The benefit of scales with seven or fewer answer options is consistent with Miller (1956) hypothetical explanation of how humans receive information and store it in short-term memory, which Simon (1974) subsequently developed in his definition

of "chunks". These results led to the decision to use a seven-point scale rather than a five-point scale.

5.4.1. Developing a questionnaire design

To inspire and motivate people to achieve high response, a stylish, well-designed and easy to understand questionnaire is required. As proposed by Dillman et al. (2009), clustering of related questions helps the participant to understand the questions and makes it easier to answer. Dillman et al. (2009) suggest grouping questions with cluster headlines and more important questions at the beginning to help get the attention of the participant and to encourage them through the complete survey and support complete feedback. The sequencing of the cluster group needs to be carefully considered. Cavana et al. (2001) highlight that is in the power of the researcher to place demographic questions according to their importance and not interrupt the motivation flow of the participants. In the consistent of several papers found in the operations literature (Do et al., 2022; Dubey et al., 2015; Kauppi, 2013; Ketokivi & Schroeder, 2004) , the recommendation is to place sensitive personal questions in the end to avoid participants becoming distressed or even not starting with the questionnaire.

5.4.2. Questionnaire Design

Derived from the literature in section 3.2.8, a self-administered closed-ended online survey was designed with a number of considerations in mind, some of which are listed in the following passages. Dillman et al. (2009) and Fowler Jr (2013) pointed out that a qualified, significant and well-designed questionnaire encourages and motivates people to respond. For self-administered surveys, the importance of remembering that respondents must first obtain information before they can understand it was emphasised by Jenkins and Dillman (1995). As a result, both the information included in the textual material and the design (visual features) should be taken into account (vocal viewpoint, such as shown visually). Numerous self-administered surveys make use of the title page to provide explanations and offer detailed instructions or assistance throughout the survey, to assist respondents in filling out the questionnaire. The participant is required to process and input all of this data. Krosnick and Presser (2010) outline some typical steps to develop appropriate questions:

- use simple syntax, easy-to-understand phrases, avoid jargon and vulgar expressions
- exclude phrases with uncertain meanings (i.e., use terminology that all responders would understand equally)
- strive for exact and explicit wording (as opposed to broad and abstract)
- ask about one issue at a time
- obtain exhaustive and unconditionally restrictive response options

- prevent asking people tense or leading questions that put pressure on them to reply

Indicated by Krosnick and Presser (2010), the context in which a question is posed may have an impact on findings in addition to how the question is worded. To minimise mistakes, it is important to consider how a questionnaire's components are organised.

5.4.3. Question order

The participant's responses to the items in the questionnaire may vary depending on the sequence in which they are asked. The question order has two main components: order, a place in the order of objects; and semantics, a place in the order of senses (Krosnick & Presser, 2010). Regarding the utilisation of several scale components for a certain construction, there are various schools of thought. Some scholars advocate random placement of all constructs to prevent compatibility between the two (Budd, 1987; Goodhue, 1998). Davis and Venkatesh (1996) advise the opposite, suggesting that the quality of measures can be improved by combining each construction question. Although each of the different methods is supported, this study uses a procedure in which the questions are combined and assigned a certain structure at random. Reporting by Goodhue and Loiacono (2002), the inclusion of intermixed questions increases the trustworthiness of structures. When questions are combined, the scope of the inaccuracy is constrained, and errors are more likely to be cancelled out by the average number of questions (Goodhue & Loiacono, 2002). Moreover, intermixing questions results in measures with marginally greater dependability (Davis & Venkatesh, 1996). Dillman et al. (2009) propose questions should be ordered so that the impacts of earlier questions are negligible, while Schwarz and Hippler (1995) suggest the sequence of the questions is made more flexible by the questionnaire format.

5.4.4. Layout

Underlined by Saunders et al. (2009) a questionnaire's form and design are important factors in how well it works. This viewpoint was supported by Christian (2003), Christian and Dillman (2004) and Tourangeau et al. (2007), who said that alterations in layout can result in significant disparities in replies. The questionnaire should be created to be simple to read and fill out. In order to motivate responders to finish the questionnaire, the design must be compelling and should not be overly long. An essential factor is the questionnaire's length: the participant may become fatigued from considering several possibilities, which may result in active intervention, in which the participant's views about one option interfere with his or her thoughts about subsequent, alternative options (Miller & Campbell, 1959). Saunders et al. (2009) suggest online surveys should be four to eight A4 pages long.

5.4.5. Grouping of questions and choosing the first question

According to Dillman (2011), clustering comparable questions together makes it easier for respondents to respond. Asking the most important questions first after grouping similar topics makes it easier for respondents to engage in the survey. Moreover, Cavana et al. (2001) advises the researcher may decide to insert items seeking personal information at the start or conclusion of the questionnaire.

Krosnick and Presser (2010) recommended that the answers to the initial questions should be simple and pleasant and proceed from the general to the specialist questions without interrupting the flow of the questionnaire. Sensitive items should be placed at the conclusion of the questionnaire, according to Dillman et al. (2009, p. 159), since doing so prevents interruptions to the questionnaire's flow. The self-administered online survey employed for this study adheres to this advice, along with the points mentioned above. As a result, the most relevant questions (variables to be assessed) were positioned in the questionnaire's opening section, while the more focused inquiries were positioned towards its conclusion. In order to collect information proprietary information, the second part of the questionnaire collected information specific to the participant's company. The third part of the questionnaire contained questions about the participants, who were prompted to reply to the constructs defined in the proposed research architecture in the first section of the questionnaire (provided in Section 4.4).

A self-administered online survey's opening question should be designed to pique participants' curiosity. Before selecting whether or not to join, participants frequently skim the questionnaire. Fanning (2005) emphasised the significance of the first question, saying that it is essential for motivating participants to continue and respond the other questions. The majority of researchers intend for survey participants to complete the survey in a sequence of top-down direction, even though the researcher has no control over the order in which respondents respond to questions in self-administered questionnaires. This is because it is possible that this is the participants' most frequent practise (Jenkins & Dillman, 1995).

Because it is simple to comprehend and respond to, the initial question in the survey used for this study requested respondents to check the following box: "I am completely aware of general requirements and the corporate plan for effective internal relocation management." The manner that information is presented to respondents visually has a significant impact on how they interpret and use the questionnaire (Jenkins & Dillman, 1995).

5.4.6. Use of Contrast

The elements of graphical layout that aid in directing respondents to complete a questionnaire are presented in this section. Jenkins and Dillman (1995) recommend participants should be able to glance over a questionnaire and swiftly determine, generally speaking, where to start and where to proceed next thanks to their pre-attentive handling. They further propose

consistent usage of visual cues including brightness, colour, form, and position to determine respondents' navigational path (Jenkins & Dillman, 1995).

5.4.7. Response Rate

Fanning (2005) outlined a wide range of best practice surveying techniques. She emphasised that one of the determinants of a survey's success is its response rate, or how many individuals really fill out the questionnaire. According to Bradburn et al. (2004), the requirements of the participants should be the first focus while creating a questionnaire. People are more likely to reply if the questionnaire is well-designed and appears authoritative and professional (Dillman et al., 2009). Grouping the questions, selecting their order, flow, and layout were important factors that were considered for this study, and all of them were implemented. Participants are likely to feel less anxious about what is expected of them and be able to focus on providing the data the questionnaire is designed to collect if there is an online cover page that explains the goal, relevance, and purpose of the research, as well as where the instructions are located in the survey (Babbie, 2020). The greatest potential response rates is achieved by using graphical elements that encourage participants to finish the questionnaire.

5.4.8. Survey Errors and Pre-testing

Groves (2004) emphasised a number of common survey and self-administered survey problems that are likely to occur, including:

- distribution mistake, which results in denying some members of the population any opportunity to participate in sample selection
- nonresponse error, which results from the failure to gather information about every member of the sample
- sampling error, which results from the population's heterogeneity on the survey measures.
- measurement error, which is caused by errors in the replies entered into the survey equipment. These result from:
 - interviewer influences on respondents' survey responses
 - mistakes made by respondents owing to incapacity to react appropriately, not trying hard enough to find the correct response or other psychological factors
 - mistake resulting from inadequate survey questionnaire phrasing
 - mistake brought on by the impact of the data gathering method (e.g. self-administered internet surveys, in-person interactions, or phone calls).

Pre-testing the questionnaires is a potential error reduction approach. Pre-testing questionnaires has been used successfully since the 1940s, according to Presser et al. (2004). Katz (1941, p. 59) stated: “The American Institute of Public Opinion, otherwise called the Gallup survey named after its principal Dr. George Gallup; the Fortune Survey, led for the magazine Fortune by Elmo Roper; and Crossley Incorporated, a public exploration association coordinated by Archibald M. Crossley, pre-test their inquiries to evade phrasings, which will be incomprehensible to general society and to avoid issues obscure to the man in the city”.

The pre-testing strategy used for this study involved peer review, supply chain subject matter experts, insurance, and consulting professionals, all of whom had extensive knowledge of SCPRM.

5.4.9. Scale item variables

The form utilised for this questionnaire is around seven pages long when the considerations outlined in the initial sections are taken into consideration. The first line of a questionnaire is commonly a header page, meant to catch participants' attention and persuade them to complete it. It usually includes a short, identifiable title and a statement summarising the relevance and goal of the survey (Fanning, 2005). Following this recommendation for this research, the initial page served as a cover page with the following information:

- the title of the study
- who was managing it, and what organisation it was from
- an encouragement to join the survey by completing a questionnaire
- the estimated time for completing the questionnaire
- the aim and objective of the research
- how the data's privacy would be managed
- where participants could address any problems or objections
- the benefits of filling out the survey
- the ability to withdraw from the survey with one week's notice
- a “thank you” message

The university's logo could be seen in the upper right corner of the first page. The questions designed to measure the constructs were on the following pages of Section A. Section B began with questions concerning the respondent's business profile. The final portion of the questionnaire dealt with the respondent's personal data (see Annex II).

Section A of the survey was made up of thirty one statements that were meant to elicit responses from respondents on the factors that the conceptual research model had already predetermined: Attitude of management support for SCPRM (AMS), Attitude of level of understanding for relocation management (ALOUR), Attitude of perceived development of core competences (APDCC), Attitude of the motivation for localisation driver (ALD), Social pressure (SP), Perceived behaviour control (PBC), Managers intention toward relocation mode choice

(MIRM) and Managers decision on relocation and use (MDRU). Section B gathered information on the firm, including the kind of control, the number of workers, the primary motivations for relocation management inside the company, and what of a number of responsibilities associated with the relocation the organisation would take on or was currently working on. Questions about the respondent's profile were included in section C, including their job title, number of years of SCPRM experience, gender, age, and greatest level of education. On the last page, there was also a thank you note.

The operationalisation of the study questionnaire was achieved by the adaptation and modification of questionnaires from diverse academic sources, including published journals in both SC/Operations and non-SC/Operations research disciplines. Researchers should "employ instruments which have previously been reported to be 'excellent', rather than laboriously build their own measurements," according to Cavana et al. (2001, p. 214). Since adopting fully new measuring scales usually results in additional reliability and validity issues, no brand-new measurement scale was constructed for this investigation. The employment of antiquated tools in a novel application constitutes an innovative inquiry, according to Phillips (1992). In this study, the measurements were put to use in a novel application called the SCPRM environment. Subject-matter experts were consulted to further validate the study questionnaire. The final research questionnaire for the pilot study, shown in Table 15 was modified and improved in light of the inputs from the experts:

Latent constructs (unobserved variables)	Academic reference	item	# in questionnaire	Observed indicator variables (scale items)
Attitude of management support for SCPRM (AMS):	Yadav and Pathak (2017) Theng and Wan (2007) Agarwal and Karahanna (2000) DeLone and McLean (1992) Monge et al. (1992)	AMS-1	9	My organization has a department or individuals entirely dedicated to internal relocation management
		AMS-2	6	My organization provides relocation management training to our supply chain/operation team to ensure internal relocation performance
		AMS-3	13	Management team meetings with external companies are frequently organized to reflect on relocation management actions
		AMS-4	24	The top management (Managing Director or equivalent) enhance the relocation management practices of individuals or teams
		AMS-5	2	Implementation of green initiatives and sustainability are important for the top management and reflected in the strategy

				for relocation, not only for external partners.
Attitude of level of understanding for relocation management (ALOUR):	Acedo and Galán (2011) Theng and Wan (2007) Yeung et al. (2003) Smeltzer and Siferd (1998) Pennings et al. (1994)	ALOUR-1	1	I am fully aware of general requirements and the company strategy for effective internal relocation management.
		ALOUR-2	8	I know how to relate relocation management tools and techniques to my company processes and internal decision making.
		ALOUR-3	33	I am understanding my organization's relocation practices, which allows me to share knowledge with my network in the company and with external partners
		ALOUR-4	5	I record details of internal relocation issues and the actions that have been put in place to mitigate or avoid future interruptions
		ALOUR-5	16	The establishment of an ongoing relocation assessment and the development of relocation risk mitigation strategies are important for external activities
Attitude of perceived development of core competences (APDCC):	Derwik and Hellström (2017) Thomas (2014) Van Hoek and Wagner (2013) Cheon et al. (2012)	APDCC-1	30	Turing capabilities into core competencies is a wise idea.
		APDCC-2	27	I am confident about analytic skills for decision-making relocation in my company and the local companies in China
		APDCC-3	7	To which extend you agree that over the past 3-5 years the most important challenges in terms of perceived core competences are following: a. functional & technical competence b. interpersonal & social competence c. management & behaviour competence
		APDCC-4	15	Internal or external partner in China seen themselves as/been an important strategic factor for constructive changes
		APDCC-5	3	My focus is on strategic relocation management, environment impacts (risks from natural events like COVID 19) are not a concern or focus, even for external or internal partner.

Attitude of the motivation for localisation driver (ALD):	Benito (2015) Cuervo-Cazurra and Narula (2015)	ALD-1	22	External relocation supports the strategic targets associated with cost reduction
	Kinkel (2012) Roza et al. (2011) Acedo and Galán (2011)	ALD-2	11	Internal relocation increase the market competitiveness, accessing to new markets and enable new differentiation strategies
	Kinkel and Maloca (2009) Maskell et al. (2007) Lewin and Peeters (2006)	ALD-3	28	Relocation enable the access to new resources To which extend you agree that over the past 3-5 years to the most important localisation drivers a. Reduce costs b. Access to new markets c. Access to non-available technology & high skill employees d. Focus on new core competences e. Follow the competitors f. Common practice in the industry
		ALD-4	14	Observed other companies exporting similar products with an existing local content increase their success in China
		ALD-5	31	Internal Relocation to China will taking strategic advantage of potential economies of scale
Social pressure against relocation (SP)	Yang et al. (2017) Musteen (2016) Pukall and Calabro (2014)	SP-1	17	Negative social pressure against internal relocation is perceived higher in family firms than in non-family firms.
	Acedo and Galán (2011) Venohr and Meyer (2009)	SP-2	12	Most important insecurity and risks in terms of supply chain / operations relocation over past 3-5 years are regulatory, legal, bureaucratic risks
		SP-3	4	Your company have distribution contracts overseas, which support you outsourcing activities
		SP-4	19	The fact that my competitors are exploring internal relocation activities will puts pressure on our firm to start with relocation activities
		SP-5	26	People whose opinions I value prefer imply in selling products in foreign markets implies high risk

Perceived behaviour control (PBC)	Kamble et al. (2019) Singh et al. (2018) Hutzschenreuter et al. (2011) Acedo and Galán (2011)	PBC-1	Section A & B in the company information	Size of the company
		PBC-2		International experience (number of years operating in international markets)
		PBC-3		Which of the following international relocation activities you will undertake or currently working on in your organisation? a. Production and Purchasing b. R&D and Product development c. Sales & Marketing d. After Sales and Service e. Finance , HR and IT
		PBC-4		20 Human resource capability and infrastructural capacity (space) of the company to implement relocation activities are secured
		PBC-5		36 Strategic relocation activities are entirely within our firm's control
Managers intention toward relocation mode choice (MIRM)	Fielding et al. (2008) Burton-Jones and Hubona (2006) Morris and Dillon (1997) Igarria and Iivari (1995)	MIRM-1	23	I intend to use relocation management tools and techniques when/following relocation activities is/being implemented in my company.
		MIRM-2	34	I intend to use relocation management tools and techniques on a regular basis for external partners
		MIRM-3	18	I want to increase the frequency of relocation risk assessments and supplier audits
		MIRM-4	32	I intend to appoint internal or external staff to formally map and rank our relocation targets and activities.
		MIRM-5	29	I expect that our company will use new IT tools or similar type of system for relocation transactions to improve the information flow to the external partners
Managers decision on relocation and use (MDRU)	Pla-Barber et al. (2019) Moons and De Pelsmacker (2015) Fielding et al. (2008)	MDRU-1	Section B	Which of the following relocation activities you will undertake or establish in the next three to five years? a. internal offshoring operations b. external offshoring operations c. concurrent offshoring operations d. none or back-shoring

	Conner and Armitage (1998) Igarria and Iivari (1995)	MDRU-2	35	Do you agree that listed instruments or tools (a – g), are frequently used by you for your relocation management practices? a. Financial modelling for internal relocation b. Supply chain / Operations worst case modelling for external partner c. Approach questioning standing (What if?) d. Mapping of internal and external processes (Value Stream Mapping) e. FMEA (Failure Mode and Effects Analysis) f. Ishikawa’s Diagram, Brainstorming g. PDCA (Plan, Do, Check, Act), 6σ (6 Sigma, permanent improvement)
		MDRU-3	10	The choice of internal offshoring operations requires more regular status management reports to our executive level than external.
		MDRU-4	21	I would rate my usage pattern of strategic relocation management practices as frequent.
		MDRU-5	25	Overall, my attitude toward internal relocation is favourable compared to external suppliers

Table 15 Measurement items for this research
Source: adapted from Reinhardt (2019)

Attitude of management support for SCPRM (AMS):

The scale used to measure 'the attitude of management support for SCPRM' in this study was adapted from prior research conducted from Reinhardt (2019) that draws on Yeung et al. (2003) and Theng and Wan (2007), and was tailored to fit in the SCPRM perspective (Agarwal & Karahanna, 2000; DeLone & McLean, 1992; Yadav & Pathak, 2017). The items utilised to assess management support included statements such as 'My organisation provides relocation management training to our supply chain/operation team to ensure internal relocation performance', 'My organisation has a department or individuals entirely dedicated to internal relocation management', 'Management team meetings with external companies are frequently organized to reflect on relocation management actions', 'The top management (Managing Director or equivalent) enhance the relocation management practices of individuals or teams', and 'Implementation of green initiatives and sustainability are important for the top management and reflected in the strategy for relocation, not only for external partners' (Yin et

al., 2023). Participants rated their level of agreement with these statements on a 7-point Likert scale, with 7 indicating strong agreement, 4 indicating neither, and 1 indicating strong disagreement.

Attitude of level of understanding for relocation management (ALOUR):

In order to measure the variable of 'attitude of level of understanding for relocation management', this study referred to previous works from Reinhardt (2019) that draws on Yeung et al. (2003) and Theng and Wan (2007). The measurement items were adapted to fit the specific context of this study (Acedo & Galán, 2011; Pennings et al., 1994; Smeltzer & Siferd, 1998). These included statements such as 'I am fully aware of general requirements and the company strategy for effective internal relocation management', 'I know how to relate relocation management tools and techniques to my company processes and internal decision making', 'I understand my organisation's relocation practices, which allows me to share knowledge with my network in the company and with external partners,' and 'The establishment of an ongoing relocation assessment and the development of relocation risk mitigation strategies are important for external activities'. Participants rated their level of agreement with these statements on a 7-point Likert scale, with 7 indicating strong agreement, 4 indicating neither, and 1 indicating strong disagreement.

Attitude of perceived development of core competences (APDCC):

The scale used to measure 'the attitude of perceived development of core competences' in this study was adapted from prior research conducted by Cheon et al. (2012). The measurement items were adapted to fit the specific SCPRM perspective of this study (Thomas, 2014; Van Hoek & Wagner, 2013). These included statements such as 'Turning capabilities into core competencies is a wise idea', 'I am confident about analytic skills for relocation decision-making in my company and the local companies in China', 'Our internal or external partner in China is an important strategic factor for constructive changes' and 'My focus is on strategic relocation management, environment impacts (risks from natural events like COVID 19) are not a concern or focus, even for external or internal partner'. Participants rated their level of agreement with these statements on a 7-point Likert scale, with 7 indicating strong agreement, 4 indicating neither, and 1 indicating strong disagreement.

The categories of core competence within the questionnaire were based on the objectives of this chapter and developed from the literature review (chapter 2.3.5). From this point of view, the following statement is adopted from the work of Derwik and Hellström (2017):

'To which extend you agree that over the past 3-5 years the most important challenges in terms of perceived core competences are following:

- a. functional & technical competence
- b. interpersonal & social competence
- c. management & behaviour competence'

Attitude of the motivation for localisation driver (ALD):

This study consulted earlier works by Acedo and Galán (2011) and Kinkel and Maloca (2009) to quantify the variable known as 'Attitude of the motivation for localisation driver (ALD)'. The items utilised to assess motivation of localisation driver included statements such as 'External relocation supports the strategic targets associated with cost reduction', 'Internal relocation increase the market competitiveness, accessing to new markets and enable new differentiation strategies', 'We observed that other companies exporting similar products with an existing local content increased their success in China', and 'Internal relocation to China will take strategic advantage of potential economies of scale', which were adapted with the findings and inputs used by Cuervo-Cazurra and Narula (2015), Kinkel (2012), Roza et al. (2011), and Maskell et al. (2007) for relocation activities. Participants rated their level of agreement with these statements on a 7-point Likert scale, with 7 indicating strong agreement, 4 indicating neither, and 1 indicating strong disagreement.

Beside as stated for the localisation driver in chapter 1.5, statements from Benito (2015) and Lewin and Peeters (2006), derived from a German manufacturing survey 2006, are included in the questionnaire:

'Relocation enable the access to new resources. To which extend you agree that over the past 3-5 years to the most important localisation drivers:

- a. Reduce costs
- b. Access to new markets
- c. Access to non-available technology & high skill employees
- d. Focus on new core competences
- e. Follow competitors
- f. Common practice in the industry'

Social pressure (SP):

The instrument employed in this study to assess 'Social pressure against relocation' was modified from earlier work by Yang et al. (2017). To fit the study context and meet the distinctive SCPRM perspective of this research, the measurement items were modified (Acedo & Galán, 2011; Musteen, 2016; Pukall & Calabro, 2014; Venohr & Meyer, 2009). Questions used to measure social pressure included the following statements: 'Negative social pressure against internal relocation is perceived higher in family firms than in non-family firms', 'The most important insecurity and risks in terms of supply chain/operations relocation over past 3-5 years are regulatory, legal, bureaucratic, 'Our company have distribution contracts overseas, which support our outsourcing activities', 'The fact that my competitors are exploring internal relocation activities will put pressure on our firm to start relocation activities', and 'People whose opinions I value prefer imply selling products in foreign markets is high risk'.

Perceived behaviour control (PBC):

In order to measure the variable of 'Perceived behaviour control', this study referred to previous works by Kamble et al. (2019) and Singh et al. (2018). The items utilised to assess perceived behaviour control included statements such as 'The company's human resource capability and infrastructural capacity (space) to implement relocation activities are secured' and 'Strategic relocation activities are entirely within our firm's control'. Participants rated their level of agreement with these statements on a 7-point Likert scale, with 7 indicating strong agreement, 4 indicating neither, and 1 indicating strong disagreement.

In addition to what is said regarding perceived behaviour control, the questionnaire includes control variables derived from Acedo and Galán (2011) and Hutzschenreuter et al. (2011). Further questions include those that address grouping levels such as: 'Size of the company', 'International experience (number of years operating in international markets)', and

'Which of the following international relocation activities you will undertake or currently working on in your organisation?

- a. Production and Purchasing
- b. R&D and Product development
- c. Sales & Marketing
- d. After Sales and Service
- e. Finance, HR and IT'

Managers' intention toward relocation mode choice (MIRM):

This study referenced earlier studies from IS technologies and utilisation from Reinhardt (2019), which draws on work by Igarria and Iivari (1995) and Morris and Dillon (1997) in order to evaluate the variable of 'Managers' intention towards relocation mode choice'. The measurement items were changed to match the research context and satisfy the unique SCPRM perspective of this study (Burton-Jones & Hubona, 2006; Fielding et al., 2008). The following assertions were among the questions used to gauge societal pressure: 'I intend to use relocation management tools and techniques on a regular basis for external partners', 'I want to increase the frequency of relocation risk assessments and supplier audits', 'I intend to appoint internal or external staff to formally map and rank our relocation targets and activities' and 'I expect that our company will use new IT tools or similar a type of system for relocation transactions to improve the information flow to the external partners'. Participants rated their level of agreement with these statements on a 7-point Likert scale, with 7 indicating strong agreement, 4 indicating neither, and 1 indicating strong disagreement.

Managers' decision on relocation and use (MDRU):

The scales Conner and Armitage (1998) and Moons and De Pelsmacker (2015) employed in their earlier work to evaluate 'managers' decision on relocation and use' was modified for use

in this investigation. The measurement items were modified to meet the unique SCPRM viewpoint of this study (Fielding et al., 2008; Igarria & Iivari, 1995). Among them were the following: 'The choice of internal offshoring operations requires more regular management status reports to our executive level than external', 'I would rate my usage pattern of strategic relocation management practices as frequent', and 'Overall, my attitude toward internal relocation is favourable compared to external suppliers'. Participants rated their level of agreement with these statements on a 7-point Likert scale, with 7 indicating strong agreement, 4 indicating neither, and 1 indicating strong disagreement.

Alongside the pattern in relocation management stated in chapter 4.3, statements derived from Pla-Barber et al. (2019) were included in the questionnaire: such as, 'Which of the following relocation activities you will undertake or establish in the next three to five years?

- a. internal offshoring operations
- b. external offshoring operations
- c. concurrent offshoring operations
- d. none or back-shoring'

The following statements are adapted from Reinhardt (2019): 'Do you agree that listed instruments or tools (a – g), are frequently used by you for your relocation management practices?

- a. Financial modelling for internal relocation
- b. Supply chain / Operations worst case modelling for external partner
- c. Approach questioning standing (What if?)
- d. Mapping of internal and external processes (Value Stream Mapping)
- e. FMEA (Failure Mode and Effects Analysis)
- f. Ishikawa's Diagram, Brainstorming
- g. PDCA (Plan, Do, Check, Act), 6σ (6 Sigma, permanent improvement)'

5.5. Pilot study

Prior to the execution of the main study and the associated data collection, a pilot study was carried out to detect any potential problems or misunderstandings with the questionnaire. A pilot study's objective, according to Saunders et al. (2009), is to test and fine-tune the questionnaire such that respondents have no trouble answering the questions and the data collecting is simple. It also aids in the researcher's evaluation of the questions' reliability and validity. A pilot study can offer further information if certain questions and scales appear to be operating as anticipated (Dillman et al., 2009). The pilot survey was conducted in the same manner through a self-managed e-mail survey to DACH companies; moreover, a follow up interview with respective managers was executed to identify if there were any issues with the

survey questions. Subsequently, there was an opportunity for an expert group discussion with operations managers from audit or government institutions to assess the questionnaire.

5.6. Main Study

The main study was then carried out after the pre-testing and pilot study, which were conducted to find and fix any potential problems with the way the survey was conducted as well as the accuracy and validity of the measurement items. The main study's specifics are presented in Chapter 6.

5.6.1. Selection of survey participants

As the statistical government offices of Germany, Austria and Switzerland including Liechtenstein has only anonymous numbers of companies working in the high technology vacuum industry, the following online directory resources were used for the potential participants:

- Industry directories (Deutschland, 2021; Liechtenstein, 2021; Österreich, 2021; Schweiz, 2021)
- Vacuum associations (ÖGV, 2021; VDMA, 2021)
- Exhibitions in the field of Semiconductor, display and solar (I. Europe, 2021; S. Europe, 2021; Glasstec, 2021)

The search terms "Vakuum", "Solar", "Display," and "Semiconductor" for the industry directory led to the identification of 2,427 (N= 2,427) enterprises among the association's members and exhibition participants as belonging to the categories mentioned above.

5.6.2. Selected Sampling

The selection process for the sample and the processes necessary to select the best sampling technique are summarised in this section. In the behavioural and social sciences, sampling approaches frequently fall into the following categories, as noted by Teddlie and Yu (2007) and succinctly stated by Saunders et al. (2009) in an overview:

- 1) probability sampling, including random, stratified, cluster, and sampling with a variety of probabilistic approaches.
- 2) purposive sampling: obtaining generalisability of the results; sampling particular or exceptional instances; sequential sampling; sampling utilising a variety of purposive strategies.

- 3) convenience sampling includes captive and volunteer samples. Basic mixed methods sampling, sequential mixed methods sampling, concurrent mixed methods sampling, and a mixture of mixed methods are all examples of mixed methods sampling.

The inclusion of every member of the probability population is essential when using probability sampling techniques, which are mostly utilised in quantitative research and randomly choose a large number of entities or particular subgroups (strata) of the population (Tashakkori & Teddlie, 2010). Probability models strive towards representation, which means that the model accurately depicts the whole population (Teddlie & Yu, 2007).

When certain locations, individuals, or events are purposefully selected for the substantial data they may provide that cannot be obtained efficiently and in an ideal way from various options, this technique is known as "purposeful sampling" (Maxwell, 2008). Selection of respondents by convenience sampling entails choosing those who are both conveniently available and enthusiastic about taking part in a study (Teddlie & Yu, 2007).

As previously mentioned, a suitable sampling strategy using anonymous snowballing was chosen for the pilot project. The primary study's overall population, which was later divided into sub-populations, was widely sampled. The use of stratified sampling, which allows for the independent evaluation of each subpopulation, is helpful for population samples with uneven subgroups (strata). For this research, each subgroup or stratum may be classified into homogenous, mutually exclusive categories because the whole population and each subgroup are known (various regions in Germany, Austria, and Switzerland/Lichtenstein; see Section 5.6.1). This allows each group to be allocated to a single level. At each stratum, systematic or straightforward random sampling models can be applied to reduce sampling error and enhance sample representation. Because the size of the sample in each stratum—in this example, Germany, Austria, and Switzerland/Lichtenstein—is taken as the size of each stratum, it is known as a proportional stratified sampling strategy. The following equation determines the stratum sample sizes:

$$n_h = \left(\frac{N_h}{N} \right) \cdot n$$

where n_h is the sample size for stratum h , N_h is the populations size for stratum h , N is total population size, and n is overall sample size.

The sample size for the main study dataset was deemed to be around 55% of the total population in each category. A total of 100 enterprises from Austria were represented by the 55 randomly chosen companies. The overall sample size was 1336 firms, with 1035 companies randomly chosen from Germany, including a total of 1881 companies, and 246 companies randomly chosen from Switzerland/Liechtenstein, comprising a total of 446 companies.

5.7. Ethics

Since this research study includes interaction with people, prior approval from the University of Gloucestershire Ethics Committee is required. The University of Gloucestershire's Handbook of Research Ethics is followed by this research project. For this study, all the guidelines and practices from the research ethics committee were followed. The set of questions, including the introduction, was forwarded to Dr. Robin Bown, and on 26th of January 2021 permission was given to conduct the survey.

5.7.1. Ethical considerations

Following a system of ethics ensures that research involving human subjects is conducted in line with university policy, rules, and regulations as well as any applicable federal and state legal requirements. Saunders et al. (2009) outlined some of the key points to think about:

- The individual's right to privacy
- The fact that participation is voluntary, and that people have the freedom to withdraw at any time
- Participant consent and potential deceit
- Preservation of participant anonymity and confidentiality of data given by identifiable people
- Participants' reactions to the methods used by researchers to acquire data
- Effects of data analysis and reporting methods on contributors
- The researcher's conduct and objectivity

5.7.2. Voluntary participation and consent

Fink (2015) analysed different approaches to conducting a survey within different groups and cultures. As preparation, she highly recommends consideration of getting the participants on board with motivation and explanation. Due to the globalisation drivers explored in this study and the presence of international participants, it was planned as part of the work to obtain informed agreement; moreover, participants were equipped with an explanatory note containing the following information:

- Description and justification of the study
- Expected benefits of the research

- Confidentiality of the research
- Voluntary participation and freedom to withdraw
- Questions / further information
- Concerns / complaints

Below are the elements not specifically stated in the research information sheet.

- time required to take part in the survey
- benefits of participating in the research
- intended results of research outcomes
- storage of data

5.8. Data Analysis

According to Hoyle (1995), SEM is a statistical method that makes it easier to examine correlations between variables that are visible and those that are concealed. It offers goals comparable to those of multiple linear regression and is an improvement over the generic linear model. As analysed by Khan et al. (2019), there is a growing interest in social network approaches through different research disciplines in using SEM modelling. They stand out as having significant advantages over other methods, such as primary factor analysis, component analysis, discriminant analysis, or multiple regression (Chin, 1998a). They offer greater adaptability in how theory and facts interact as well as the capacity to reproduce the analysis that underlies this assertion.

The following are the benefits of SEM software for research projects:

1. Scientists can assess the strength of the relationship between fluctuations in one variable and variations in another or analyse more variables using correlation coefficients (Hoe, 2008).
2. The purpose of SEM is to determine if theoretically reasonable models offer a satisfactory match to the data that have been obtained (Kember & Leung, 2005).
3. SEM offers academics a thorough method for evaluating and changing theoretical models (Anderson & Gerbing, 1988).

The goal of this study corresponds with how hidden constructs and abstract psychological factors like "intelligence" or "attitude toward change" are often studied in SEM. It considers methodological problems typically connected to quantitative measurements and the measures used to contain them. The data analysis concept for this investigation is shown in Figure 19.

The inner research model for this study, shown in Figure 19, was created using the structural equation modelling (SEM) approach, using the programs Statistical Package for Social Sciences (SPSS) form 28.0 for Windows and R Project for Statistical Computing, version 3.6.3 for Windows. The R Project uses libraries for structural equation modelling. In this study the following R-libraries were used: “lavaan”, “semPlot”, “semTools”.

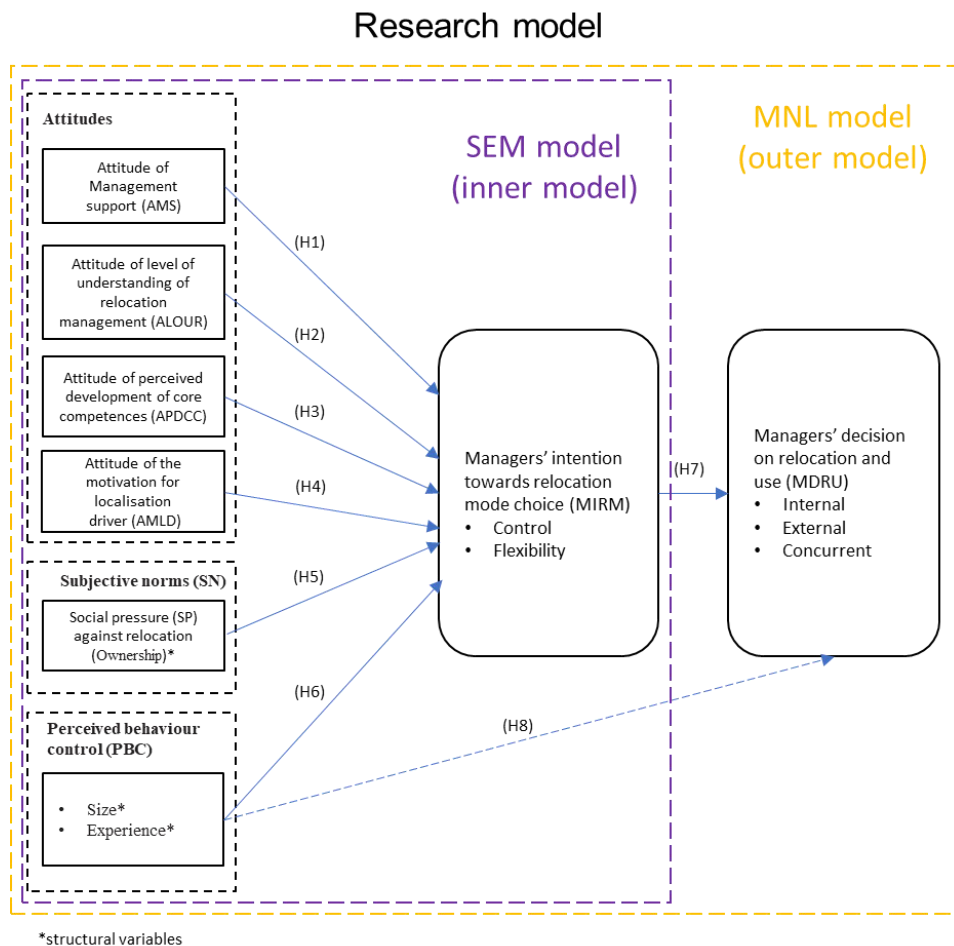


Figure 19 Data analysis concept of research model

SEM is a statistical approach that enables the evaluation of links between latent (unobserved) variables and observable variables (Hoyle, 1995). It has a similar goal to multiple linear regression and is an extension of the general linear model. SEM is becoming a more and more popular choice for data analysis across a range of academic disciplines. SEM-based approaches have gained widespread use due to their significant benefits over other procedures (such as factor analysis, multiple regression, principal component analysis or discriminant analysis), offering more flexibility for the interaction between theory and data. Additionally, there is an option to do the analysis again (Chin, 1998b), which is an advantage for the analysis.

By applying SEM techniques, as demonstrated by correlation coefficients, scientists may initially ascertain how closely fluctuations in one variable compare to variations in one or more other variables (Hoe, 2008). SEM can also assess if theoretically sound models offer a good match to observable data (Kember & Leung, 2005, p. 163). SEM also gives researchers a variety of methods for evaluating and modifying theoretical models (Anderson & Gerbing, 1988, p. 411). SEM

fundamentally combines a variety of multivariate techniques with the aim of investigating the underlying structures or connections among model variables (Buhi et al., 2007, p. 76). To evaluate and improve theoretical models for explaining or predicting social or behavioural events, SEM was developed (Bentler, 1988). Hair et al. (2006) indicate that:

If a theory can be expressed in terms of relationships among measured variables and latent constructs, SEM will provide a conceptually appealing way to test how well the theory fits reality as represented by empirical data collected from questionnaire (p. 734).

SEM has recently received more attention from sociology scientists for the reasons outlined above (Yasin et al., 2009), and it has been widely applied in a variety of domains, for example, IS research (Burton-Jones & Hubona, 2006; Hsu et al., 2009; Lu et al., 2007; Qureshi & Compeau, 2009; Teo, 2010), operations management (Sadikoglu & Zehir, 2010; Shah & Goldstein, 2006) and management (Briscoe et al., 2005; Fotopoulos & Psomas, 2009; Kong et al., 2010; Lin & Jang, 2008; Nair, 2006; Pan et al., 2009; Yasin et al., 2009).

As observed by Chin (1998b), SEM provides the following forms of freedom to the scientist:

- (1) develop models of the interactions between various predictor and criteria variables,
- (2) develop latent (invisible) variables,
- (3) Calculation errors for observed variable measures, and
- (4) quantitatively comparing previous substantive/theoretical and measurement hypotheses to empirical data (i.e. confirmatory analysis).

SEM is a multivariate statistical method that encompasses and unifies multiple regression/path analysis and factor analysis (Tao, 2009). The measurement model was tested after it was determined to be appropriate (based on a solid data match) and was theoretically supported. The structural model, which was based on the measurement model, was analysed to discover a model that showed a good agreement with the data. The relevance of the hypotheses (represented by distinct paths in the structural model) was then determined using the model, which produced an acceptable match.

Because the measure variable used for the MDRU construct is a polytomous variable for the outer model displayed in Figure 19, there were two options to investigate in possible significance of outcome, name and discriminant analysis:

Discriminant analysis is a multivariate analysis based on the study of a nominally scaled variable and several metrically scaled variables. The characteristics of the nominally scaled variables represent the affiliations of the units under investigation to two or more alternative subgroups, and thus to those subgroups that are mutually exclusive (Sekaran & Bougie, 2016).

Multinomial logistic regression is an expansion of binary logistic regression that allows for more than two categories of the dependent or outcome variable. Similar to binary logistic regression, multinomial logistic regression uses maximum likelihood estimation to evaluate the probability of belonging to a category (Norris et al., 2012). By use of the multidimensional

logistic regression, a category of dependent variables is selected as the reference category, in this study “external”. Due to the nature of the multinomial logistic regression model, it does not assume normality, linearity, or homoscedasticity, which is not fulfilled for the discriminant analysis: this model is taken for the analysis of the outer model.

5.8.1. Quantitative Measures and Methodological Issues

This section focuses on the methodological issues that are typically connected to quantitative measurements and suggests ways to mitigate them.

5.8.1.1. Common Method Variance

The concern of common method variance (CMV) is a commonly made case against utilising online or mail-in surveys to collect data (Brannick et al., 2010). Many scientists consider CMV, also known as mono method bias, to be "a potential issue in behavioural research" (Podsakoff et al., 2003, p. 879). Although various academics have suggested that the CMV problem may be exaggerated (Crampton & Wagner, 1994; Lindell & Whitney, 2001; Spector, 1987, 1994), the majority believe that CMV is a recurring problem.

In his study, Ajzen (2005) stressed that subjective assessments of self-reports may be skewed because respondents frequently describe socially acceptable behaviour while downplaying or denying socially undesirable behaviour. People typically describe behaviour in excess or in deficiency when it comes to sensitive matters connected to social stigma or legal violations, according to Ajzen (2005). It should be mentioned that if the behaviour is not very delicate or highly esteemed socially, self-reports frequently seem to be pretty accurate. According to multiple research that used self-report surveys (Moorman & Podsakoff, 1992; Ones et al., 1996), there is little indication that social desirability is a common cause of correlation inflating (CMV). According to Parry and Crossley (1950), there is a high degree of concordance between self-assessment and other objective measurements in the situation of moderately insensitive behaviour. SCPRM usage can be viewed as a neutral activity as it does not involve societal stigmatisation or breaking the law, in Ajzen’s (2005) opinion.

5.8.1.2. Nonresponse Bias

Self-administered surveys that are sent via the mail or online are regularly criticised in terms of their representativeness and propensity to exhibit non-responsive bias. Tharenou et al. (2007) claim that non-response bias appears when the person answering the questionnaire is significantly or systematically different from the non-respondent. According to Couper (2000, p. 473), "not all people included in the sample are willing or able to complete the survey". Because of this, it is impossible to generalise from survey results about how the entire sample will react; for example, the possibility of generalising the population may be limited.

This study uses the anonymous, identifiable reverse, cross-sectional and self-administered web-based survey questionnaire data collection tool. In addition, institutions, governments, or regulatory authorities in the DACH area do not readily provide industry-specific statistics for study. Therefore, a more conventional approach has been identified and used to address non-response bias and to verify the reliability of the study results. Donald (1960) recommends comparing early and late responses when dealing with non-respondent bias. Participation in surveys is used in this approach to calculate the impact of non-participation. Typical comparisons include important survey factors that affect response rates. The resistance model (Filion, 1976; Fitzgerald & Fuller, 1982), which refers to participants responding to their surveys late or after a later effort, is the basis of the assumption implicit in such comparisons. Similar to non-responders, a follow-up email or call is often required to remind them (Stopher & Sheskin, 1982, p. 37).

5.8.1.3. Sampling Error

To generalise the findings of samples retrieved within the range of random errors to the community, investigations using a survey tool often aim to collect representative data for the population (Bartlett et al., 2001). A factor in research design that may affect the detection of significant differences, correlations, or interactions is the sample size (Peers, 2006). The main goal of study design is to reduce both beta error (failing to detect true population differences) and alpha error (identifying differences that are not present in the population) (Peers, 2006). Finding the right sample size is a challenge that Cochran (1977, p. 81) considered:

One method of determining sample size is to specify margins of error for the items that are regarded as most vital to the survey. An estimation of the sample size needed is first made separately for each of these important items.

Most research in this area utilise a .05 or .01 alpha level to establish the sample size (Ary et al., 1996). Using the t-value of the chosen alpha value, the Cochran expression includes the alpha level (for example, if the sample size is greater than 120, the t-value for alpha .05 is 1.96). The following broad guidelines govern the permissible margin of error in educational and social studies: 5% for data in categories, 3% for continuous data (Krejcie & Morgan, 1970).

This study employs a method to define the minimal return sample size in accordance with the table created by Bartlett et al. (2001) in order to minimise sampling error (see Table 16). The minimum number of samples returned for continuous data should be at least 119, based on continuous data for the indicated model with an uncertainty of 0.03 and an alpha of 0.05 ($t = 1.96$) and a population size larger than 4000. Sample sizes of 100 or less are considered small, 100 to 200 are considered medium, and 200 or more are considered large. Taking into account the requirements of SEM, which is the analytical method chosen and discussed in Chapter 6 for the inner model, the reference is derived from Kline (2011). A sample size of at least 200 is used in this study in order to satisfy SEM criteria.

Table 1: Table for Determining Minimum Returned Sample Size for a Given Population Size for Continuous and Categorical Data

Population size	Sample size					
	Continuous data (margin of error = .03)			Categorical data (margin of error = .05)		
	alpha = .10 t = 1.65	alpha = .05 t = 1.96	alpha = .01 t = 2.58	p = .50 t = 1.65	p = .50 t = 1.96	p = .50 t = 2.58
100	46	55	68	74	80	87
200	59	75	102	116	132	154
300	65	85	123	143	169	207
400	69	92	137	162	196	250
500	72	96	147	176	218	286
600	73	100	155	187	235	316
700	75	102	161	196	249	341
800	76	104	166	203	260	363
900	76	105	170	209	270	382
1,000	77	106	173	213	278	399
1,500	79	110	183	230	306	461
2,000	83	112	189	239	323	499
4,000	83	119	198	254	351	570
6,000	83	119	209	259	362	598
8,000	83	119	209	262	367	613
10,000	83	119	209	264	370	623

NOTE: The margins of error used in the table were .03 for continuous data and .05 for categorical data. Researchers may use this table if the margin of error shown is appropriate for their study; however, the appropriate sample size must be calculated if these error rates are not appropriate. Table developed by Bartlett, Kotrlík, & Higgins.

Table 16 Determining minimum returned sample size
Source: Bartlett et al. (2001)

5.8.2. Statistical Procedures Observed

In order to allay worries about issues frequently connected to quantitative measures, this section focuses on the methods used to assess statistical procedures.

5.8.2.1. Data Screening

It is crucial for the data to be precisely coded, exact, and error-free before the data analysis is finished. The data from the web database was coded by the researcher and entered into a Microsoft Excel spreadsheet. Any values that were missing were discovered by the information screening measure. To assure the accuracy of the data, each poll underwent an independent evaluation to make sure the information record was complete and free of mistakes.

Data must have a continuous scale and a multivariate normal distribution to be used in SEM data analysis (Byrne, 2010; Finney & DiStefano, 2006; Kline, 2011). Furthermore, it is crucial to ensure that there are no collinearity problems and to look for potential outliers (which are explained in the section below). Pre-examinations were conducted in this inquiry in order to use the SEM method (Kline, 2011).

5.8.2.2. Detecting Outliers

The primary task while undertaking multivariate data analysis is finding outliers (Filzmoser & Hron, 2008). This study's outlier identification method is based on the Mahalanobis distance function because it is integrated and available in R Project. The Mahalanobis distance method provides better results (Dang & Serfling, 2010). It measures the separation of each perception from the average base of the perceptions in a three-dimensional space. "Mahalanobis distance is computed on the basis of the variance of data points... data points far away from the center of mass are considered outliers" (Matsumoto et al., 2007, p. 461).

5.8.2.3. Normality and Collinearity

Prior to using SEM, an examination of data normality was carried out to increase the suitability of the multivariate analyses. Frequently, three files, univariate skewness, univariate kurtosis, and multivariate kurtosis, are used to evaluate non-normality distribution (Finney & DiStefano, 2006).

Collinearity is a very desirable effect for the indicators of the individual constructs. The problem is when the constructs have strong interdependencies. If such dependencies exist, the path coefficients cannot be reliably estimated (overestimation or underestimation of the individual effects). To check the relationships between the indicators in advance, an explorative factor analysis with varimax rotation was calculated (LaNasa et al., 2009).

5.8.2.4. Factor Analysis

By using exploratory factor analysis to experimentally examine the underlying component structure of the measuring instrument, Worthington and Whittaker (2006) highlighted the need of completing a first authentication of the measuring instrument (EFA). For this study, EFA was completed first, then CFA. Finding underlying components that may elucidate the dimensions connected with significant data variability is the main goal of factor analysis (Mahmoud & Kamel, 2010).

To determine the underlying factor structure of each set of explanatory variables, EFA was completed at the preliminary assessment stage (Cavusgil & Zou, 1994). In order to generate usable subsets that evaluate various qualities from the item set, the underlying dimensionality of the initial set of items was evaluated (Worthington & Whittaker, 2006). To “identify the factor structure or model for a set of variables”, EFA is employed (Bandalos, 1996, p. 389). Researchers employ EFA, a popular exploratory method, to uncover the smaller collection of k latent factors to reflect the larger set of j variables (Henson & Roberts, 2006). Pedhazur and Schmelkin (1991, p. 66) stated: “Of the various approaches to studying the internal structure of a set of variables or indicators, probably the most useful is some variant of factor analysis”. Factor analysis is typically used to manage the theoretical frameworks behind a particular dataset and the degree to which these structures characterise the initial dataset (Henson & Roberts, 2006). Although EFA is widely used and valuable in research, it is not without detractors. The criticism mostly concentrates on the interpretation of the results, which partly depends on the researcher's reflective judgement.

Mulaik (1987, p. 301) recommended: “It is we who create meanings for things in deciding how they are to be used. Thus, we should see the folly of supposing that EFA will teach us what intelligence is, or what personality is”.

After factor extraction, a wide variety of rotations are possible (Tabachnick & Fidell, 2012), all of which explain the identical degree of variation in the initial data, although with somewhat different factor definitions. The researcher's evaluation of its interpretability and scientific value determined which alternative was ultimately chosen. In essence, reliability refers to dependability, stability, predictability, consistency, and precision, and it has to do with how consistently any measurement process produces the same findings across trials (Carmines & Zeller, 1979; Kerlinger, 2007).

For CFA evaluation, the final model is used, incorporating the components identified by EFA. In order to determine if the factor structure supplied by EFA matches the data from a new sample trial after an instrument has been successfully surveyed using EFA, academics typically use CFA (Worthington & Whittaker, 2006). The degree of construct-to-pathway collinearity and the quality of fit of the conceptual model are assessed in this study using CFA.

In view of the fact that SEM is regarded as the most modern method for performing CFA (Worthington & Whittaker, 2006), this research uses SEM to perform CFA using the R Project package. SEM is basically split into two parts: (1) measurement model estimation, where latent variables are given and assessed using CFA, and (2) SEM structural model assessment, where the hypotheses H1 through H6 are tested.

5.8.2.5. Reliability

Hair et al. (2007, p. 424) define “reliability is when a scale or question consistently measure a concept”. For this study, the use of a multi-point scaled items to measure the variables is planned. In accordance with Cavana et al. (2001), either inter-item consistency reliability or the Cronbach's alpha reliability coefficients can be used to show the internal reliability of the measures. Oppenheim (1992) stated that the Cronbach's alpha approximates the proportion of the total variation that is not attributable to mistake, which is a characteristic of the scale's dependability. As the goal of the study is to classify the interdependency factor weight rating of core competences, establishing reliability is one necessary success factor to gain the required results.

5.8.2.6. Validity

As stated by Hair et al. (2007, p. 426), “validity is associated with the term accuracy. A construct measures what it is supposed to measure.” Before conducting any theoretical testing, using face validity with a pre-assessment is a useful way to begin researching validity (Gallagher et al., 2008). A panel of specialists with knowledge of the research issue reviewed the questionnaire to assess its face validity. Seeking to determine whether the questions on the questionnaire were clear and understood by assessing their reactions (Cavana et al., 2001). After determining the face validity, the following step is to evaluate the content validity to make sure that the appropriate measurements use the appropriate and descriptive collection of objects when considering the design (Cavana et al., 2001).

A research proposal was carried out in the form of a pilot study, with a two-prong strategy using classification of the measurement items that define the idea from the literature in one manner and exposure of the questionnaire to an expert panel for feedback. According to Cavana et al. (2001), constructing validity is figuring out how well the findings attained through the application of the measure suit the theoretical model for which the test was created. To attain the required level of construct validity, the measuring dimension must show both convergent validity and discriminant validity (Kong et al., 2010). Tools to illustrate validity are included in the Statistical Package for Social Sciences (SPSS). To confirm that the created model's construct validity is valid, confirmatory factor analysis (CFA) employing structural equation modelling (SEM) was performed (Kline, 2005). The method may be used to compare the discriminatory validity between the greatest correlation coefficient and the lowest Cronbach's Alpha score. In order to detect behavioural factors for this study that may affect rationality in

'satisfaction for relocation', this factor will be used in evaluating the survey and questionnaire results.

In order to assess discriminant validity, this study also considered at the Fornell-Larcker criterion for reflective measurement models. To demonstrate discriminant validity, each variable's square root of the average variance extracted (AVE) must be greater than its greatest correlation with any other variable. This is known as the Fornell-Larcker criterion (Hair Jr et al., 2014; Sarstedt et al., 2014). According to the Fornell-Larcker method, a variable's linked indicators share more variance with it than any other variable, in accordance with Hair Jr et al. (2021). The Fornell-Larcker criteria analysis demonstrated that the structural model's and measurement's discriminant validity had been established.

5.8.2.7. Goodness of Fit

The main goal of the SEM fit criterion is to show how well the predetermined model corresponds to the empirical data (Schermmelleh-Engel et al., 2003). In other terms, the goodness of fit index (GFI) value of a statistical model represents how well the model fits a collection of observations. Measures of overall model fit show how well SEM matches the empirical information (Schermmelleh-Engel et al., 2003). The difference among observed values and those anticipated by the model in issue is often summarised by the GFI. It is vital to evaluate the model's fit to the data since the objective is to determine if the connections between the measurements and latent variables in the model accurately match the observed correlations in the data (Weston & Gore, 2006).

Various standards for the visualisation of SEM findings were provided by Boomsma (2000), Breckler (1990), Hoyle (1995), Raykov et al. (1992) and Steiger (1988); according to McDonald and Ho (2002), numerous model fit metrics have been devised to evaluate how well the sample's distribution approximates its true distribution (McDonald & Ho, 2002). Chi-square (χ^2) analysis is the most often used GFI of SEM (Cheung & Rensvold, 2002). The chi-square (χ^2) measurement provides a very sensitive statistical test of model fit for large sample sizes, but it is not a practical test (Cheung & Rensvold, 2002).

In addition to the chi-square (χ^2), several GFIs have been suggested as alternatives. The relative fit list (CFI) (Bentler, 1990), non-normed fit index (NNFI), (Bentler & Bonett, 1980), and root mean squared error of approximation (RMSEA) (Steiger, 1989) are examples.

Sivo et al. (2006) listed well-known fit indices that are often employed for the evaluation of model fit, such as the adjusted goodness of fit index (AGFI), normed fit index (NFI), Bollen's normed index rho1 (Bollen, 1986), Bollen's non-normed index delta 2 (Bollen, 1989), McDonald's measure of centrality (McDonald & Hartmann, 1992; McDonald & Marsh, 1990), parsimonious goodness of fit index (PGFI), parsimonious normed fit index (PNFI), root mean residual (RMR), root mean squared residual (RMSR) and standardized root mean residual (SRMR).

R Project offers various different GFIs (Rosseel, 2012). Hoyle (2015) argues that not all configurations of fit measures need to be reported. Arbuckle (2020) emphasised that there are a lot of possibilities available, so it could be challenging to pick one that would work, while also observing the choice is made easier when the fit measure's purpose is to compare models with one another rather than evaluate the worth of models in relation to an objective benchmark. A number of concepts were used to develop different types of fit index (Gerbing & Anderson, 1992).

Lei and Wu (2007) suggested that when evaluating the overall model fit, a number of indices should be investigated concurrently. The CFI, GFI, NFI, and NNFI are the fit indices that are most often reported, according to a research by McDonald and Ho (2002). Although there are no set standards for judging model fit, Crowley and Fan (1997) argued that it is important to use a range of indices, since each one indicates a distinct viewpoint of model fit. Nonetheless, Sivo et al. (2006) express concern that having access to many indices will only make it more difficult to evaluate models, since different fit indices focus on diverse aspects of model applicability (for instance, parsimony (the impact of sample size) contrasts with null models, etc.).

It is vital that this measurement, together with its freedom levels and associated p-values, are regularly given, for even the model chi-square has several limitations (Hayduk et al., 2007; Kline, 2005). According to Kline (2005), the following unimportant fit indices ought to be given and translated for SEM analyses: χ^2 , RMSEA, CFI and SRMR. Comparable suggestions are made by Boomsma (2000), who also suggests that each equation's squared multiple correlations be stated. According to Hooper et al. (2008), the chi-square (χ^2) statistic, its degrees of freedom (χ^2/df) and p-values, RMSEA and its associated confidence intervals, SRMR and CFI should all be included. These indices were chosen for use in this study because previous research has shown them to be the most reliable and least susceptible to sample size, model misspecification, and parameter estimates.

5.8.2.8. Multinomial logit models

Multinomial logit models represent a proper use for a nominal dependent variable where the number of levels is more than two (Kwak & Clayton-Matthews, 2002). In common previous research for customer choice behaviour in marketing, health economics, and industrial organisation and user experience in transport systems, multinomial logit models (MLN) were used as the next step of analysis after factors and clusters had been obtained in the initial analysis (Demirbag & Glaister, 2010; Fiebig et al., 2010; Geng et al., 2017; Klimek, 2021). The link between the dependent nominal variable and one or more continuous independent variables, which may be intervals or ratios, is shown using MLNs, which are used to describe data. There can be any number of values (classes) of the dependent variable provided there are at least three. If only two categories be used, multiple binomial regression is more appropriate for these cases.

Multinomial logit models support in the following way (Norris et al., 2012, p. 335):

1. To detect a minor number of variables which essentially differentiate between groups or categories of the dependent variable
2. To detect the other variables which are ineffective in terms of distinguishing between groups or categories of the dependent variable
3. To create actual predictions of which group an individual will be a member of (i.e. what category of the dependent variable) on the basis of their known values on the predictor variables.

In this study, due to the target variable MDRU with the three evaluation-relevant groups, “external”, “internal” and “concurrent” relocation mode, the MNL model was used as the best fit for confirmation of the proposed hypotheses.

5.9. Chapter conclusion

In this chapter, the methodology—which includes the study design and research instrument—has been thoroughly discussed. Considering the study design, the questions to ask, the layout, the grouping of the questions, the use of contrast, the response rate, and survey mistakes, the chapter has designed the research questionnaire. These factors were evaluated and discussed. Considerations around developing the research scale items for each variable and, eventually, the research questionnaire that resulted from this are detailed. This chapter also examines the method for selecting research participants as well as a suitable sampling strategy. The methods of data analysis selected for this inquiry were then discussed. The statistical methods chosen to accomplish the researcher's goals were discussed, as well as the methodological issues related to quantitative measurements. This defines the bases to conduct a pilot study. Additionally, the multinomial logit models for the outer model were used to test the hypothesis between MIRM and MDRU (H7) and the explanation for the inner model included SEM analysis to test the hypotheses between the intention (MIRM) and the constructions of AMS, ALD, APDCC, ALOUR, SP, and PBC (H1 to H6). The next chapter contains a description of the steps that were followed to conduct the pilot study for this investigation.

6. Pilot Study

The procedures that were carried in execution of the pilot study are explained in this chapter. It documents the steps taken to achieve the computation and the findings of the pilot research. Moreover, it explains the adjustments that were made as a result of the findings of the pilot research. At the end, a chapter summary follows. Figure 20 provides a schematic summary of the key parts of this chapter.

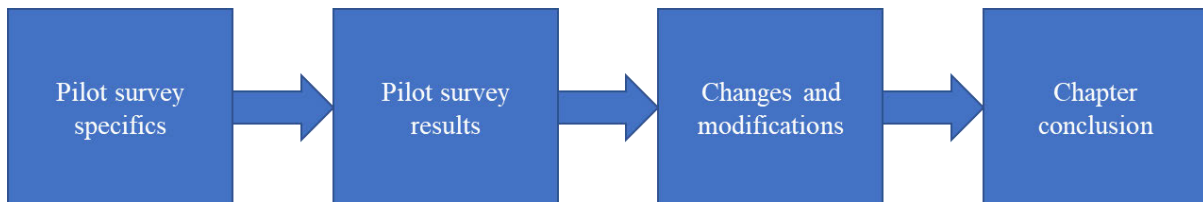


Figure 20 Schematic overview of key elements of pilot survey chapter

The purpose of the pilot research, as indicated in section 5.5, was to identify any survey-related problems so that the validity and reliability of the questions could be assessed. Due to this, subject matter specialists investigated a preliminary draught survey (as shown in chapter 5.4.8). The assessment was done to give the questionnaire some preliminary testing. Experts offered input on the questionnaire's aesthetic appeal, ambiguous material, repetition, consistency, grammatical mistakes, and other potential issues that could arise throughout the questionnaire-answering process.

They also criticised the survey's design, instrument length, and the wording of the item scales. After the analysis, concepts were included to the survey before the pilot research was carried out. This is consistent with Cavana et al. (2001)'s advice that surveys should, wherever possible, be piloted prior to the start of the main study using a viable sample of people from the population or a group of participants who are extremely close to the target demographic.

6.1. Pilot study steps

According to the suggestion of Dillman et al. (2009), this project obtained the supplementary cycles for pilot testing. The first step was gathering feedback on the draught questionnaire from several people who had specialised expertise of some survey components. At this level, the face validity issue—the question of whether the measuring items seem to measure the concept being investigated and evaluated—was resolved (Sekaran & Bougie, 2016). Step two involved competent consultations on the finished survey to detect concerns with wording, question ordering, the visual layout, and any directional problems. One method used to determine content validity was the evaluation of whether the objects meant for assessing the construct appropriately covered the region of interest (Tharenou et al., 2007). The third phase was conducting a pilot test among a subset of the intended audience to assess the connections between the survey's questions and implementation strategies. Finally, a small group reviewed the completed questionnaire adaption before the main research was conducted.

6.1.1. Pretesting of Questionnaire

A preliminary version of the questionnaire was examined by eight participants, including cohorts of PhD candidates, family members, and business professionals. Every expert had experience and were knowledgeable about relocation to China. The review represented a chance for pretesting the survey, whereby the observers gave criticism on the survey in regard to its generally visual appearance and furthermore to recognise any substance uncertainty, reiteration, inconsistency, linguistic confusions and other potential issues that can arise while the survey is being conducted. All experts were informed of the survey's expectations. Additionally, they were contacted to provide feedback on the format of the questionnaire, the language of the scales, the length of the instrument, and the questions' relationships to the constructs. After the analysis meeting, the major investigation tool was adjusted in light of the feedback.

6.1.2. Pilot Testing

Wherever possible, a questionnaire should be guided by respondents who are a working sample of the target community or closely resemble the objective population, as advised by Cavana et al. (2001). Before setting up a survey for the primary inquiry, pilot research might reveal problems with the questionnaire and the accompanying execution preparations.

6.1.3. Participants and Sample Size for the Pilot Study

A small sample of respondents should be organised, according to Cavana et al. (2001) to determine if respondents find the questions' wording to be justified and clear. Fabrigar et al. (1999) acknowledge that the majority of the guidance for choosing an appropriate sample size for EFA proposed by methodologists is typically based on their determination of either the count of measurement items included or defining a foundational minimum sample size, regardless of the number of variables measured. Kline (1986) suggested 100 as the bare minimum number of individuals, considering that EFA will be performed as a component of the pilot research (respondents).

The statistical methods used in factor analysis aim to simplify complicated collections of data. According to Kline (2014), factor analysis is frequently used in sociologies to examine the relationships between variables. According to him, a correlation is a quantitative assessment of how well two sets of scores are understood, with a scale of +1 for complete agreement, 0 for no relationship, and -1 for complete disagreement.

According to Fabrigar et al. (1999), the quantity of variables measured is typically a key consideration in the rules for factor analysis that define sample size. As a result, they dictate the proportion of the test sample (N) to the number of variables (p) under investigation.

Different researchers suggest including the minimum necessary sample size, (N). Five members were suggested by Gorsuch and Ortberg (1983) for each variable measured, and Kline (1979, 1986) supported their assertion that the example size (N) shouldn't be less than 100. There is not a single, clear criterion that can be used to empirical research that is expressly unrelated to the sample size of pilot studies, since the literature provides a wide range of ideas with regard to sample size in factor analysis. In order for future factor investigations to provide stable arrangements, this research adopts the stance that the sample size used for the pilot study should permit pre-testing and reliability analysis (Saunders et al., 2009).

In light of the aforementioned recommendations, 36 participants were invited. In order to increase the number of returns while considering the time, effort, and expense connected with collecting the data for the pilot survey, an anonymous snowballing strategy was adopted. This gave participants a range of tasks and encouraging them to forward them to peers, other organisations, and sub-suppliers, which was how the anonymous snowballing strategy was aimed. Another anonymous technique also demonstrated that participant privacy was protected to the businesses who were directly contacted. A sum of 62 responses to the pilot survey were observed on the online survey server. Since this was an anonymous survey, a description of the participants is not possible.

6.2. Pilot Study Results and Findings

In this section, the pilot study's findings are provided. The response rate is examined before the demographic and business data of the pilot survey participants are presented (sections B and C of the questionnaire). The EFA and findings of the reliability analysis are presented after this (section A of the survey). It was discovered through factor analysis on the questionnaire's section A that the scales from earlier verified research that were modified or updated for this study were appropriate. Henson and Roberts (2006) contend that factor analysis is closely related to both the development of theories and the assessment of score validity. Factors known as latent constructs are designed to both cause and characterise reactions to observable variables. The statement "theory building and construct measurement are joint bootstrap operations" was noted by Hendrick and Hendrick (1986, p. 393). Moreover, factor analysis and testing the integrity of the measurement inform future theory development (Henson & Roberts, 2006). Analysis of the stability of the scales (Cronbach's alpha) is the aim of reliability analysis. The average intercorrelations among the items assessing the idea are used to calculate Cronbach's alpha. The greater the internal consistency reliability, the nearer to 1 Cronbach's alpha is (Sekaran & Bougie, 2016).

6.2.1. Response rate

The total number of disseminated questionnaires divided by the number of valid and actionable responses yields the response rate, which is calculated as follows:

23 (responses that were valid): 66 (questionnaires that were distributed in total) x 100 = 34.84% response rate.

6.2.2. Descriptive Statistics

The descriptive statistics provided in this area contain the findings from the pilot survey's sections B and C. In Section B, respondents were asked to provide information about their companies, including the country where they are based, the number of employees, the primary justifications for relocation management within their company, and the steps they planned to take or were already taking to relocate the company's operations. In Section C, the respondents were questioned about their own backgrounds, including their job title, years of SCPRM experience, gender, age, and highest level of education.

The following tables include descriptive data on the participants' positions within the firm, years of experience, gender, age, level of education, and planned relocation mode.

Location of your company		Total
Germany	%	34.8%
Austria	%	
Switzerland/Liechtenstein	%	65.2%
Total	%	100.0%
	n	23

Table 17 Pilot survey location of company

My position in the company		Total
C-level Executive / MD (CEO)	%	27.3%
Department Head / Head of supply chain / procurement etc	%	31.8%
Management level / Supply Chain / Manager / Procurement Manager	%	27.3%
Middle Management / Procurement Officer / Supply Chain Officer etc.	%	13.6%
Total	%	100.0%
	n	22

Table 18 Pilot survey position in the company

How much experience do you have in relocation management?		Total
Less than 3 years	%	13.0%
Between 3 and 6 years	%	30.4%
Between 7 and 10 years	%	13.0%
More than 10 years	%	43.5%
Total	%	100.0%
	n	23

Table 19 Pilot survey experience in relocation management

Gender		Total
Female	%	
Male	%	100.0%
Total	%	100.0%
	n	23

Table 20 Pilot survey participants by gender

Age		Total
Below 30	%	
30 – 39	%	
40 -49	%	26.1%
50 and above	%	73.9%
Total	%	100.0%
	n	23

Table 21 Pilot survey participants by age

Highest education level		Total
Postgraduate or above	%	60.9%
Undergraduate university	%	21.7%
A-Level	%	
High school diploma or less	%	17.4%
Total	%	100.0%
	n	23

Table 22 Pilot survey participants by education level

Relocation operation modes		Total
Internal offshoring operations	%	42.9%
External offshoring operations	%	23.8%
Concurrent offshoring operations	%	19.0%
No or back-shoring	%	14.3%
Total	%	100.0%
	n	21

Table 23 Pilot survey relocation operation mode

Table 24 provides descriptive information about the primary causes of relocation management. Participants had to select at least one item for this section of the survey. The data shows that the elements "operational needs such as production, quality, cost reducing" and "pressure from consumers or the market" were selected by 93% of respondents as their primary reasons for

doing relocation management, respectively. As seen in Table 24, the other items had substantially lower choice frequencies.

		Total
Operational requirements such as production, quality, cost cutting, etc.	%	91.3%
Pressure from customers or market	%	78.3%
Supply chain risk management	%	39.1%
Requirements from stakeholders	%	34.8%
Requirements from company headquarters	%	34.8%
Legal, regulatory or compliance requirements	%	21.7%
Others	%	4.3%
Corporate social responsibility and ethics requirements	%	
Total	%	304.3%
	n	23

Table 24 Pilot survey participants main reasons for doing relocation management

Table 25 provides the descriptive data on the relocation-related tasks the respondents would embark on or were already working on. Respondents had to select at least one item for this section of the survey. According to the information in Table 25, "Production and Purchasing" was the most frequently chosen answer, chosen by 91.3% of respondents. "After Sales and Service" was chosen by 39.1% of respondents, and came in second, while 30.4% of respondents chose "Sales & Marketing."

		Total
Production and Purchasing	%	91.3%
After Sales and Service	%	39.1%
Sales & Marketing	%	30.4%
R&D and Product development	%	17.4%
Finance, HR and IT	%	13.0%
Others	%	
Total	%	191.3%
	n	23

Table 25 Pilot survey participants international relocation activities

6.2.3. Exploratory Factor Analysis

As already described in chapter 5.8.2.4, for the pilot study EFA was used to “identify the factor structure or model for a set of variables” (Bandalos, 1996, p. 389). The scales used in this study were taken from earlier, reliable investigations and modified or created specifically for it. EFA

was initially conducted with all 41 variables in order to assess the dependability of the measurement scales (all objects of the 31 queries and sub-questions in part A of the survey). Ticehurst and Veal (2000) emphasised the significance of determining the intrinsic dependability of every component that must be kept at the forefront. Then, within-block factor analyses for each of the seven constructs were displayed to discuss the dimensionality of the measuring objects. This method is compatible with efforts to determine the uni-dimensionality (of connected objects measuring a certain construct) inside an unit by Koufteros (1999) and Lu et al. (2007).

EFA strives to reduce the number of factors (variables), measure multicollinearity among correlated factors, evaluate construct validity in surveys, examine correlations or structures between factors (variables), establish theoretical constructs, and provide evidence for suggested theories (Pett et al., 2003; Thompson, 2004).

With just a small amount of information lost, factor analysis is utilized to turn the data included in a large number of starting variables into a smaller set of variables (factors) (Hair et al., 2010, p. 17). One strategy for analysing correlation and covariation among all the variables and attempting to distinguish latent variables from measurable variables is the abstraction technique (Osborne, 2014). There are various extraction techniques existing, including principal component analysis (PCA), principal axis factoring (PAF), maximum likelihood (ML), image factoring, alpha extraction and canonical (Osborne & Costello, 2009; Tabachnick et al., 2001; Thompson, 2004).

A critical step in determining if a variable may be related to many factors is the analysis of the data (Williams et al., 2012). By boosting high item loadings and decreasing low item loadings, rotation strategies will help to give solutions that are easier to understand and more straightforward (Taherdoost et al., 2014). Two processes, orthogonal and oblique rotation approaches, are often employed (Taherdoost et al., 2014). Numerous rotation options are available for both the orthogonal and oblique methods: the orthogonal approach has varimax, quartimax, and equamax; the oblique technique has direct oblimin and promax (Osborne, 2014). According to Osborne and Costello (2009) orthogonal rotation is a little simpler than oblique rotation and yields a lot of easily comprehensible outcomes. The most common type of rotational approaches for EFA uses Thompson (2004)'s Varimax rotation, which frequently offers a straightforward framework (Taherdoost et al., 2014).

The scales used to measure each variable were taken from previously approved studies, while within-block factor analysis was employed to confirm the dimensionality of the measuring items. This approach is based on the paper of Lu et al. (2007) and used to identify blocks that are unidimensional (of related items that assess a certain concept).

Factor loadings higher than 0.30 are thought to satisfy the lowest threshold; loadings of 0.40 are seen to be more significant; and if loadings are 0.50 or higher, they are thought to be

practically significant, according to Hair et al. (1998, p. 111). Assessing the internal dependability of every aspect that has to be retained is crucial, as per Ticehurst and Veal (2000). Hair et al. (1998) state the initial findings from exploratory research should be accepted if the internal reliability has an alpha coefficient of 0.6 or above. Cronbach's alpha value of 0.6 is frequently used as the suggested minimum threshold, confirmed by Kline (1994) who also corroborated this.

Scale retention in this pilot survey has been achieved with a minimal factor loading of 0.50 and a Cronbach's coefficient alpha of 0.6. Table 26 shows the loadings for each construct along with the corresponding Cronbach's alpha coefficient. Many products for the original EFA did not meet the required minimum standards. Consequently, alterations and changes were made, which are described in the following section.

indicator	loading	alpha	alpha indicator not included	# indicators
ALD_01	0.848	0.698	0.571	4
ALD_02	0.360	0.698	0.788	4
ALD_04	0.835	0.698	0.582	4
ALD_05	0.817	0.698	0.544	4
ALOUR_01	0.697	0.715	0.643	5
ALOUR_02	0.712	0.715	0.647	5
ALOUR_03	0.749	0.715	0.665	5
ALOUR_04	0.808	0.715	0.620	5
ALOUR_05	0.392	0.715	0.737	5
AMS_01	0.794	0.699	0.558	5
AMS_02	0.725	0.699	0.666	5
AMS_03	0.817	0.699	0.572	5
AMS_04	0.822	0.699	0.591	5
AMS_05	0.103	0.699	0.795	5
APDCC_01	0.808	0.389	0.017	4
APDCC_02	0.854	0.389	0.055	4
APDCC_04	0.685	0.389	0.387	4
APDCC_05	-0.115	0.389	0.686	4
PBC_01	0.815	0.487		2
PBC_02	0.815	0.487		2
SP_01	0.830	0.408	0.278	5
SP_02	0.307	0.408	0.458	5
SP_03	0.573	0.408	0.355	5
SP_04	0.773	0.408	0.179	5
SP_05	0.013	0.408	0.449	5
MIRM_01	0.699	0.624	0.544	5
MIRM_02	0.710	0.624	0.472	5
MIRM_03	0.730	0.624	0.573	5

MIRM_04	0.686	0.624	0.601	5
MIRM_05	0.391	0.624	0.640	5
MDRU_01	0.846	0.289	-0.035	3
MDRU_02	0.820	0.289	-0.238	3
MDRU_03	-0.241	0.289	0.596	3

Table 26 Pilot survey EFA by constructs

6.3. Changes and Modifications

The modifications and updates made to the questionnaire following the first EFA are described in this section. Each of the eight constructs is examined separately, and specific enhancements, alterations, or adjustments are shown in the following tables. After the pilot survey was completed, more adjustments were made, includes a few linguistic nuances in the English language.

Additionally, questions 35, 10, 21 and 25 in section A were omitted, since the planned operation mode for relocation are directly asked in section B. The pilot survey's excessive number of optional selections unnecessarily complicated it, therefore requiring a reduction. The updated formulation made the questionnaire shorter and more to the point. The questionnaire received additional criticism for having 36 scale items in total, thus steps were taken (described in more detail below) to shorten it. Table 27 displays the summary of all changes made.

Section A: Relocation Management Questionnaire

Latent constructs (unobserved variables)	item	in questionnaire	Observed indicator variables (scale items)
Attitude of management support for SCPRM (AMS):	AMS-1	9	My organization has a department or individuals entirely dedicated to internal relocation management
	AMS-2	6	My organization provides relocation management training to our supply chain/operation team to ensure internal relocation performance
	AMS-3	13	Management team meetings with external companies are frequently organized to reflect on relocation management actions
	AMS-4	24	The top management (Managing Director or equivalent) enhance the relocation management practices of individuals or teams
	AMS-5	2	Implementation of green initiatives and sustainability are important for the top management and reflected in the strategy for relocation, not only for external partners.

Attitude of level of understanding for relocation management (ALOUR):	ALOUR-1	1	I am fully aware of general requirements and the company strategy for effective internal relocation management.
	ALOUR-2	8	I know how to relate relocation management tools and techniques to my company processes and internal decision making.
	ALOUR-3	33	I am understanding my organization's relocation practices, which allows me to share knowledge with my network in the company and with external partners
	ALOUR-4	5	I record details of internal relocation issues and the actions that have been put in place to mitigate or avoid future interruptions
	ALOUR-5	16	The establishment of an ongoing relocation assessment and the development of relocation risk mitigation strategies are important for external activities
Attitude of perceived development of core competences (APDCC):	APDCC-1	30	Turing capabilities into core competencies is a wise idea.
	APDCC-2	27	I am confident about analytic skills for decision-making relocation in my company and the local companies in China
	APDCC-3	7	To which extent you agree that over the past 3-5 years the most important challenges in terms of perceived core competences are following: a. functional & technical competence b. interpersonal & social competence c. management & behaviour competence
	APDCC-4	15	Internal or external partner in China seen themselves as/been an important strategic factor for constructive changes
	APDCC-5	3	My focus is on strategic relocation management, environment impacts (risks from natural events like COVID 19) are not a concern or focus, even for external or internal partner.
Attitude of the motivation for localisation driver (AMLD):	ALD-1	22	External relocation supports the strategic targets associated with cost reduction
	ALD-2	11	Internal relocation increase the market competitiveness, accessing to new markets and enable new differentiation strategies
	ALD-3	28	Relocation enable the access to new resources To which extend you agree that over the past 3-5 years to the most important localisation drivers a. Reduce costs b. Access to new markets c. Access to non-available technology & high skill employees

			d. Focus on new core competences e. Follow the competitors f. Common practice in the industry
	ALD-4	14	Observed other companies exporting similar products with an existing local content increase their success in China
	ALD-5	31	Internal Relocation to China will taking strategic advantage of potential economies of scale
Social pressure against relocation (SP)	SP-1	17	Negative social pressure against internal relocation is perceived higher in family firms than in non-family firms.
	SP-2	12	Most important insecurity and risks in terms of supply chain / operations relocation over past 3-5 years are regulatory, legal, bureaucratic risks
	SP-3	4	Your company have distribution contracts overseas, which support you outsourcing activities
	SP-4	19	The fact that my competitors are exploring internal relocation activities will puts pressure on our firm to start with relocation activities
	SP-5	26	People whose opinions I value prefer imply in selling products in foreign markets implies high risk
Perceived behaviour control (PBC)		Section A & B in the company information	Size of the company
			International experience (number of years operating in international markets)
			Which of the following international relocation activities you will undertake or currently working on in your organisation? a. Production and Purchasing b. R&D and Product development c. Sales & Marketing d. After Sales and Service e. Finance, HR and IT
	PBC-1	20	Human resource capability and infrastructural capacity (space) of the company to implement relocation activities are secured
	PBC-3	36	I have the resources, knowledge, and the ability to start with relocation activities
	PBC-4	new	Relocation activities have become part of my routine
Managers intention toward relocation mode choice (MIRM)	MIRM-1	23	I intend to use relocation management tools and techniques when/following relocation activities is/being implemented in my company.
	MIRM-2	34	I intend to use relocation management tools and techniques on a regular basis for external partners
	MIRM-3	18	I want to increase the frequency of relocation risk assessments and supplier audits
	MIRM-4	32	I intend to appoint internal or external staff to formally map and rank our relocation targets and activities.

	MIRM-5	29	I expect that our company will use new IT tools or similar type of system for relocation transactions to improve the information flow to the external partners
Managers decision on relocation and use (MDRU)	MDRU-1	Section B	Which of the following relocation activities you will undertake or establish in the next three to five years? a. internal offshoring operations b. external offshoring operations c. concurrent offshoring operations d. none or back-shoring
	MDRU-2	35	Do you agree that listed instruments or tools (a – g), are frequently used by you for your relocation management practices? a. Financial modelling for internal relocation b. Supply chain / Operations worst case modelling for external partner c. Approach questioning standing (What if?) d. Mapping of internal and external processes (Value Stream Mapping) e. FMEA (Failure Mode and Effects Analysis) f. Ishikawa’s Diagram, Brainstorming g. PDCA (Plan, Do, Check, Act), 6σ (6 Sigma, permanent improvement)
	MDRU-3	10	The choice of internal offshoring operations requires more regular status management reports to our executive level than external.
	MDRU-4	21	I would rate my usage pattern of strategic relocation management practices as frequent.
	MDRU-5	25	Overall, my attitude toward internal relocation is favourable compared to external suppliers

Table 27 Refinement of measurement items for the main survey

Note: The questions with grey highlights were removed, and the questions with orange highlights were rewritten without any additional question subcategories.

Using the pilot research dataset, a second within-block factor EFA simulation was run and assessed, comprising the last 20 items. Table 28 shows the results of this EFA simulation experiment. The findings show that most of the seven constructs had Cronbach's alpha correlations that were over the required minimum level of 0.60 or above for the initial examination during exploratory research. All of the scale items' factor loadings were higher than the required amount of 0.40. For retention reasons, all of the loadings for the scale elements were assessed to be more significant since they exceeded the minimal criterion of 0.40. The calculated values were initially only preliminary in nature and deemed as sufficient for the pilot research as a whole, due to the limited sample size for this assessment (23 valid replies).

indicator	loading	alpha	alpha indicator not included	# items
ALD_01	0.886	0.788	0.635	3
ALD_04	0.862	0.788	0.699	3
ALD_05	0.782	0.788	0.791	3
ALOUR_02	0.576	0.726	0.898	3
ALOUR_03	0.920	0.726	0.474	3
ALOUR_04	0.918	0.726	0.488	3
AMS_01	0.840	0.775	0.694	3
AMS_03	0.798	0.775	0.748	3
AMS_04	0.862	0.775	0.644	3
APDCC_01	0.824	0.686	0.546	3
APDCC_02	0.859	0.686	0.461	3
APDCC_04	0.665	0.686	0.740	3
PBC_01	0.815	0.487		2
PBC_02	0.815	0.487		2
SP_01	0.842	0.485	0.230	3
SP_03	0.563	0.485	0.560	3
SP_04	0.759	0.485	0.398	3
MIRM_01	0.773	0.571	0.413	3
MIRM_02	0.749	0.571	0.420	3
MIRM_03	0.702	0.571	0.536	3

Table 28 EFA simulation based on 20 items by constructs

6.4. Chapter conclusion

This chapter describes the procedures used in the pilot study to assess the accuracy and precision of the measurement objects and the associated constructs. This had a favourable impact on how the initial research was carried out and provided the foundation for carrying out the major survey. EFA and within-block factor analysis were applied to all eight components. From the first 36 questions (three scale items for each of the seven components) in the pilot research, 23 questions were kept. A more streamlined version of Section B was included to the form as a consequence of analysis and participant feedback. The constructs and related measuring items that emerged from EFA were used in the main research. To achieve a greater response rate from the intended practitioner of the main survey, the results from the pilot study are successfully included into the questionnaire. The next chapter will detail the procedures used for the primary study. We will go over the sequence of CFA-based applied statistical analyses in detail and show the outcomes of the project's hypothesis testing.

7. Results Main Study

In this chapter, the data analysis and main survey findings are discussed. Before the main research was carried out, adjustments and alterations resulting from the pilot survey (detailed in section 6.3) were combined. The statistical processes and analyses are presented in this chapter using the Windows versions of the SPSS statistical package for social sciences (version 27.0) and the R Project for Statistical Computing (version 3.6.3) (as described in section 5.8.2). This chapter presents the response rate of the main survey, the sample representativeness, the data screening, the descriptive statistics of the respondents, and the findings of the hypothesis testing. A graphical description of the main ideas in this chapter is shown in Figure 21.

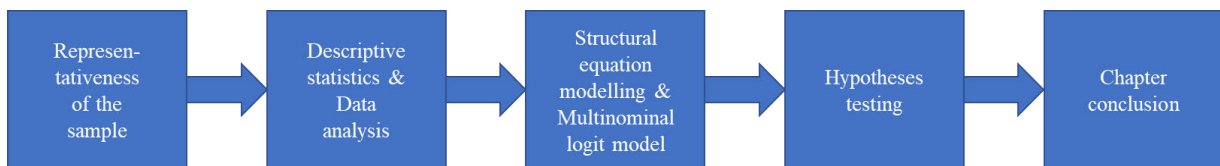


Figure 21 Schematic overview of key elements of main survey chapter

7.1. Representativeness of the Sample

The main survey was executed from May 2021 till middle of July 2021. Following online directory resources of Industry directories (Deutschland, 2021; Liechtenstein, 2021; Österreich, 2021; Schweiz, 2021), Vacuum associations (ÖGV, 2021; VDMA, 2021) and exhibitions (I. Europe, 2021; S. Europe, 2021; Glasstec, 2021) were used for the potential participants. With the search key words “Vakuum”, “Solar”, “Display” and “Semiconductor” for the industry directory, those listed as members of the association and the participants of the exhibition, a total number of a total of 2,427 (N= 2’427) companies that fit the aforementioned categories, were identified. The sample size for the primary research dataset is deemed to be around 55% of the total population in each category. 1336 businesses were chosen at random, and 1336 businesses were contacted via email to participate in the main survey.

Cook et al. (2000) deem response representativity to be more significant in survey analysis than response rate. Furthermore, response representativity, rather than response rate, is more crucial for survey analysis, according to Heath and Thompson (2000, p. 821). Campion (1993) assert surveys must be devoid of obvious biases, have appropriate response rates, and account for the impact of non-respondents (nonresponse bias is discussed in section 7.3). Through a proportional random sample of the target population, this study gathered data from the vacuum sector and their primary technology providers, together with two major participants in the semiconductor, display, and solar industries in the DACH economy. This is in line with findings from the "China 2025" programme (Huimin et al., 2018), which show that the semiconductor, display, and solar industries are crucial to the formation and growth of the nation's economy. Therefore, respondents to this poll included individuals from significant high tech industrial sectors. Given that this study effectively addressed the crucial problem of

response representativeness, it is plausible to draw such conclusion (i.e. the respondents represented high tech key industry companies applicable to SCRPM).

7.2. Descriptive Statistics

The descriptive statistics for the participants are shown before further analysing the outcomes of the statistical analysis for the primary survey. This section includes summaries and graphical analysis of the participants' demographic information as well as corporate information (part B and part C of the survey).

7.2.1. Demographic Data of Respondents (Section C)

According to the positions of the participants, Table 29 presents the descriptive statistics. Amongst the participants, 19.7% of were executives; 23.9 % were head of department, 36.7% held senior management level positions and the remaining 19.7% held middle management positions.

My position in the company		total	Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	No or back-shoring
C-level Executive / MD (CEO	%	19.7%	14.9%	23.5%	17.6%	31.6%
Department Head / Head of supply chain/procurement etc	%	23.9%	28.7%	20.4%	32.4%	
Senior Management level / Supply Chain / Manager / Procurement Manager	%	36.7%	36.6%	37.8%	29.4%	36.8%
Middle Management / Procurement Officer / Supply Chain Officer etc.	%	19.7%	19.8%	18.4%	20.6%	31.6%
total	%	100.0%	100.0%	100.0%	100.0%	100.0%
	n	259	101	98	34	19

Table 29 Position of respondents

In terms of how long they had held the designated appointment, 32.2% of participants stated they had less than three years' experience, 22% stated they had between three- and six-years' experience, 18.2% said they had between seven- and ten-years' experience, and 27.7% said they had more than ten years' experience. Table 30 presents the descriptive data for the years of experience in SCRPM.

How much experience do you have in relocation management?			Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	no or back-shoring
		total				
Less than 3 years	%	32.2%	33.3%	36.3%	11.8%	36.8%
Between 3 and 6 years	%	22.0%	18.6%	24.5%	29.4%	15.8%
Between 7 and 10 years	%	18.2%	15.7%	16.7%	29.4%	26.3%
More than 10 years	%	27.7%	32.4%	22.5%	29.4%	21.1%
total	%	100.0%	100.0%	100.0%	100.0%	100.0%
	n	264	102	102	34	19

Table 30 Statistics for Years of experience

6.5% of the 262 responders were female, while 93.5% were men. Table 31 lists the gender-related descriptive data.

Gender			Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	no or back-shoring
		total				
Female	%	6.5%	5.0%	5.0%	5.9%	15.8%
Male	%	93.5%	95.0%	95.0%	94.1%	84.2%
total	%	100.0%	100.0%	100.0%	100.0%	100.0%
	n	262	101	101	34	19

Table 31 Gender ratio of respondents

In relation of age, 2.3% of participants were below the age of 30 years old; 10.6% of participants were between 30 to 39 years old; 36.7% of participants were between 40 to 49 years old and 50.4% of participants were 50 years old and above. Table 32 displays the age-related descriptive data.

Age			Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	no or back-shoring
		total				
Below 30	%	2.3%	2.0%	1.0%	5.9%	
30 - 39	%	10.6%	7.8%	10.8%	14.7%	15.8%
40 -49	%	36.7%	39.2%	43.1%	17.6%	26.3%
50 and above	%	50.4%	51.0%	45.1%	61.8%	57.9%
total	%	100.0%	100.0%	100.0%	100.0%	100.0%
	n	264	102	102	34	19

Table 32 Age ratio of respondents

Additionally, respondents were questioned about their educational history. 66.3% of participants had post-graduate degrees or above; 19.3% of participants (x%) had an undergraduate university degree level; 5.3% of participants had an education level equivalent to GCSE 'A' level and 9.1% of participants (x %) had a high school diploma or lower. The descriptive statistics are displayed in Table 33.

Highest education level		total	Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	no or back-shoring
Post graduate or above	%	66.3%	72.8%	60.4%	67.6%	68.4%
Undergraduate university	%	19.3%	19.4%	19.8%	20.6%	15.8%
A-Level	%	5.3%		8.9%	2.9%	15.8%
High school diploma or less	%	9.1%	7.8%	10.9%	8.8%	
total	%	100.0%	100.0%	100.0%	100.0%	100.0%
	n	264	103	101	34	19

Table 33 Highest education level

7.2.2. Business Information (Section B)

The breakdown of participants in terms of the company's control is shown in Table 34. Data indicate that 62.7 % of participants were from firms that not family owned, 23.9 % from firms were family owned, 7.1 % from firms that were family managed, and 6.3 % from firms in other control modes. The ordered data displays that 31% of firms were in the influence of the family ownership. These results are in keeping with predictions; a mixture of family-controlled and non-family-owned businesses exist, although the majority of businesses operate under non-family ownership structures.

Type of control		total	Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	no or back-shoring
No family owned	%	62.7%	64.4%	62.7%	54.3%	73.7%
Family owned	%	23.9%	22.1%	25.5%	25.7%	21.1%
Family managed	%	7.1%	6.7%	7.8%	8.6%	-
Others (please specify)	%	6.3%	6.7%	3.9%	11.4%	5.3%
total	%	100.0%	100.0%	100.0%	100.0%	100.0%
	n	268	104	102	35	19

Table 34 Type of control

Table 35 displays the participation distribution based on employee counts and company size. The results show that 6.8% of respondents worked for businesses with between 150 and 300 workers, 6.8% for businesses with above 300 employees, and 11.3% of respondents worked for businesses with fewer than 50 employees. The organised data shows that 82.7% of participants came from companies with more than 150 workers, and 88.7% of organisations had more than 50 employees. These results are in accordance with expectations: despite the presence of both small and large businesses, the majority of businesses employ a sizeable workforce spanning a range of mid- to large-sized companies.

Company size by number of employees		total	Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	no or back-shoring
Less than 50	%	11.3%	7.7%	17.6%	2.9%	15.8%
Between 50 to 150	%	6.0%	6.7%	5.9%	8.6%	
Between 151 to 300	%	6.8%	5.8%	6.9%	8.6%	10.5%
More than 300	%	75.9%	79.8%	69.6%	80.0%	73.7%
total	%	100.0%	100.0%	100.0%	100.0%	100.0%
	n	266	104	102	35	19

Table 35 Company size by number of employees

The distribution of participants is shown in Table 36 in respect to the primary causes of relocation management within their organisation.

Main reasons for doing relocation		total	Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	No or back-shoring
Operational requirements such as production, quality, cost cutting, etc.	%	78.6%	82.2%	78.4%	80.0%	61.1%
Pressure from customers or market	%	61.1%	67.3%	50.0%	68.6%	61.1%
Supply chain risk management	%	33.6%	36.6%	31.4%	25.7%	50.0%
Requirements from stakeholders	%	22.1%	19.8%	20.6%	25.7%	22.2%
Requirements from company headquarters	%	21.4%	21.8%	18.6%	20.0%	33.3%
Legal, regulatory or compliance requirements	%	12.2%	13.9%	12.7%	2.9%	11.1%
Corporate social responsibility and ethics requirements	%	8.0%	5.9%	6.9%	14.3%	5.6%
Others	%	5.7%	3.0%	8.8%	2.9%	5.6%
total	%	242.7%	250.5%	227.5%	240.0%	250.0%
	n	262	101	102	35	18

Table 36 Main reasons for doing relocation management within your organisation

The distribution of participants in respect to the following international relocation activities they intended to carry out or were now working on in their organisation is shown in Table 37.

international relocation activities			Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	no or back-shoring
		total				
Production and Purchasing	%	75.6%	78.8%	71.9%	91.2%	61.1%
After Sales and Service	%	48.4%	46.2%	52.1%	50.0%	33.3%
Sales & Marketing	%	46.1%	43.3%	47.9%	55.9%	33.3%
R&D and Product development	%	20.5%	23.1%	19.8%	17.6%	11.1%
Finance, HR and IT	%	6.2%	4.8%	4.2%	5.9%	11.1%
Others	%	3.9%	1.0%	8.3%		5.6%
total	%	200.8%	197.1%	204.2%	220.6%	155.6%
	n	258	104	96	34	18

Table 37 International relocation activities in the firms.

Table 38 displays the participants' distribution in relation to the location of their company.

Location of your company			Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	no or back-shoring
		total				
Germany	%	56.6%	54.8%	60.8%	44.1%	72.2%
Austria	%	6.0%	2.9%	10.8%	2.9%	5.6%
Switzerland/Liechtenstein	%	37.4%	42.3%	28.4%	52.9%	22.2%
total	%	100.0%	100.0%	100.0%	100.0%	100.0%
	n	265	104	102	34	18

Table 38 Location of participants' company

Table 39 displays the participants distribution in relation to their relocation operation mode in their company.

Which of the following relocation modes you will undertake or establish in the next three to five years in China?			Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	no or back-shoring
		total				
Internal offshoring operations	%	40.0%	100.0%			
External offshoring operations	%	39.2%		100.0%		
Concurrent offshoring operations	%	13.5%			100.0%	
no or back-shoring	%	7.3%				100.0%
total	%	100.0%	100.0%	100.0%	100.0%	100.0%
	n	260	104	102	35	19

Table 39 Relocation operations mode

7.3. Determining Non-bias Return

When using web-based surveys, there is a chance that responses will be biased (Menachemi et al., 2006). In order to assess and quantify the possibility of survey response bias, a nonresponse bias check was carried out for this survey. Comparing early replies to late responses is the method recommended for addressing nonresponse bias, as mentioned in Section 5.8.1.2 of Chapter 5. In this study, the first 50 instances (early responses) and the last 50 instances (late respondents) were contrasted. Table 40 displays the comparison's findings.

Chi-Quadrat-Test p = 0.182			non_bias	
			first 50	last 50
Type of control	Not family owned	%	52.0%	70.0%
	Family owned	%	32.0%	22.0%
	Family managed	%	10.0%	2.0%
	Others (please specify)	%	6.0%	6.0%
	total	%	100.0%	100.0%
		n	50	50

Chi-Quadrat-Test p = 0.814			non_bias	
			first 50	last 50
Location of your company	Germany	%	36.0%	37.5%
	Austria	%	2.0%	4.2%
	Switzerland/Liechtenstein	%	62.0%	58.3%
	total	%	100.0%	100.0%
		n	50	48

Chi-Quadrat-Test p = 0.307			non_bias	
			first 50	last 50
Company size by number of employees	Less than 50	%	16.3%	6.0%
	Between 50 to 150	%	10.2%	12.0%
	Between 151 to 300	%	8.2%	4.0%
	More than 300	%	65.3%	78.0%
	total	%	100.0%	100.0%
		n	49	50

Chi-Quadrat-Test p = 0.095			non_bias	
			first 50	last 50
My position in the company	C-level Executive / MD (CEO)	%	16.3%	16.7%
	Department Head / Head of supply chain/procurement etc	%	20.4%	27.1%
	Management level / Supply Chain / Manager / Procurement Manager	%	32.7%	45.8%
	Middle Management / Procurement Officer / Supply Chain Officer etc.	%	30.6%	10.4%
	total	%	100.0%	100.0%
		n	49	48

Chi-Quadrat-Test p = 0.132			non_bias	
			first 50	last 50
How much experience do you have in relocation management?	Less than 3 years	%	40.0%	26.5%
	Between 3 and 6 years	%	14.0%	32.7%
	Between 7 and 10 years	%	14.0%	16.3%
	More than 10 years	%	32.0%	24.5%
	total	%	100.0%	100.0%
		n	50	49

Chi-Quadrat-Test p = 0.205			non_bias	
			first 50	last 50
Gender	Female	%	10.0%	2.1%
	Male	%	90.0%	97.9%
	total	%	100.0%	100.0%
		n	50	48

Chi-Quadrat-Test p = 0.301			non_bias	
			first 50	last 50
Age	Below 30	%	8.0%	2.1%
	30 - 39	%	18.0%	10.4%
	40 -49	%	36.0%	35.4%
	50 and above	%	38.0%	52.1%
	total	%	100.0%	100.0%
		n	50	48

Chi-Quadrat-Test p = 0.789			non_bias	
			first 50	last 50
Highest education level	Postgraduate or above	%	62.0%	61.2%
	Undergraduate university	%	20.0%	26.5%
	A-Level	%	4.0%	2.0%
	High school diploma or less	%	14.0%	10.2%
	total	%	100.0%	100.0%
		n	50	49

Table 40 Comparison between early and late respondents

The results showed that, in regard to participants' demographic backgrounds and the companies they represented, the % outcomes between the first fifty responses and the final fifty responses were equivalent results. Comparing demographics also takes into account the company's level of control (Chi-Quadrat-Test p = 0.182); Location of the company (Chi-Quadrat-Test p = 0.814); Company size by number of employees (Chi-Quadrat-Test p = 0.307); position in the company (Chi-Quadrat-Test p = 0.095); experience in years in relocation management (Chi-Quadrat-Test p = 0.132); gender (Chi-Quadrat-Test p = 0.205); age (Chi-Quadrat-Test p = 0.301); and education level (Chi-Quadrat-Test p = 0.789);

Van der Velde et al. (2004, p. 62) acknowledge that "a sample is considered as representative for a variable if the variable of the units or objects in the selected sample have the same relative frequency distribution as the total population from which the sample is drawn" in an effort to further support the comparison between early and late responses. Both the early and late responses had comparable frequency distributions when compared to the total of 271 participants that participated in the main poll. The evaluations done in this section indicate that the survey participants were distributed similarly, and nonresponse bias is not apparent. The first and late responses were also subjected to an independent samples Chi-Quadrat-test to see whether there were any appreciable differences in their personal and organisational profiles. This makes it feasible to draw the conclusion that response bias is expected to be small (Menachemi et al., 2006).

7.4. Main Study Analysis

In order to investigate the internal and external model and test the hypotheses, the purpose of statistical data evaluation is to declare how well the obtained data satisfies the supplied anticipated probability, such as the established hypotheses (Cowan, 1998). The following sections go into further depth on the various statistical procedures that were undertaken for this study.

7.4.1. Valuation of Normality and Collinearity

The assumption of multivariate normality is involved in maximum likelihood estimation in SEM (McDonald & Ho, 2002). However, the use of the greatest likelihood estimate approach can be troublesome if the variables are not normal (Korkmaz et al., 2014). Therefore, to guarantee that the data set had appropriate levels of multivariate normality, the normality of the distribution of each variable was tested by analysing skewness and kurtosis. Table 41 displays descriptive statistics of the constructs of the model, according to which all measured items show commonality at a consistent level.

In order to examine univariate distributions to indicate possible cases of multivariate non-normality, the Mardia (1970) statistic uses the skewness and kurtosis functions to assess the multivariate normality of data. If the variables are normally distributed, Mardia's normalised estimate of multivariate kurtosis should be less than +/- 10 (Byrne, 2010, p. 104). Table 41 demonstrates the multivariate non-normality of the data. Outliers and the kurtosis of the data are both reflected in the outcomes.

Indicators	total							
	N	mean	median	sd	Skew	Skew CR	Kurtosis	Kurtosis CR
ALD_01	271	5.24	5.00	1.18	-0.65	-4.40	0.31	1.06
ALD_04	271	4.47	4.00	1.44	-0.08	-0.53	-0.59	-2.01
ALD_05	271	4.60	5.00	1.46	-0.25	-1.70	-0.62	-2.11
ALOUR_02	271	4.85	5.00	1.30	-0.82	-5.53	0.62	2.09
ALOUR_03	271	5.14	5.00	1.20	-0.90	-6.08	0.88	2.97
ALOUR_04	271	4.89	5.00	1.38	-0.70	-4.76	0.34	1.16
AMS_01	271	4.13	4.00	1.72	-0.08	-0.54	-0.88	-2.98
AMS_02	271	3.97	4.00	1.72	-0.06	-0.40	-1.03	-3.48
AMS_04	271	4.87	5.00	1.34	-0.59	-3.99	-0.02	-0.06
APDCC_01	271	5.52	6.00	1.08	-0.86	-5.81	0.60	2.04
APDCC_02	271	4.84	5.00	1.36	-0.67	-4.54	0.13	0.44
APDCC_04	271	5.11	5.00	1.18	-0.94	-6.39	1.24	4.20
PBC_01	271	4.75	5.00	1.48	-0.66	-4.45	0.06	0.21
PBC_03	271	4.56	5.00	1.41	-0.24	-1.59	-0.52	-1.75
PBC_04	271	3.94	4.00	1.67	-0.15	-0.99	-0.75	-2.53
SP_01	271	4.58	5.00	1.35	-0.23	-1.54	-0.37	-1.25
SP_03	271	5.31	6.00	1.38	-0.86	-5.79	0.51	1.72
SP_04	271	4.93	5.00	1.48	-0.72	-4.90	0.10	0.35
MIRM_01	271	4.54	4.00	1.40	-0.33	-2.23	-0.22	-0.74
MIRM_02	271	4.33	4.00	1.40	-0.32	-2.13	-0.21	-0.72
MIRM_03	271	4.79	5.00	1.26	-0.17	-1.17	-0.35	-1.18

Table 41 Table for assessment of normality

Indicators & offshoring activities

		total	Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	no or backshoring
ALD_01	mean	5.24	5.54	4.91	5.29	5.26
ALD_04	mean	4.47	4.81	4.12	4.71	4.05
ALD_05	mean	4.60	4.88	4.16	5.06	4.26
ALOUR_02	mean	4.85	4.95	4.69	5.14	4.74
ALOUR_03	mean	5.14	5.30	4.96	5.23	5.16
ALOUR_04	mean	4.89	5.02	4.72	5.20	4.47
AMS_01	mean	4.13	4.40	3.79	4.51	3.58
AMS_03	mean	4.14	4.28	3.95	4.46	3.84
AMS_04	mean	4.87	5.13	4.60	5.09	4.74
APDCC_01	mean	5.52	5.56	5.39	5.54	6.11
APDCC_02	mean	4.84	5.06	4.53	5.14	4.58
APDCC_04	mean	5.11	5.26	5.00	5.20	4.68
PBC_01	mean	4.75	4.93	4.68	4.94	4.16

PBC_03	mean	4.56	4.72	4.28	4.74	5.11
PBC_04	mean	3.94	3.99	3.82	4.51	3.37
SP_01	mean	4.58	4.66	4.35	4.71	5.00
SP_03	mean	5.31	5.58	4.92	5.60	5.32
SP_04	mean	4.93	5.19	4.66	5.00	4.47
MIRM_01	mean	4.54	4.72	4.06	4.51	5.74
MIRM_02	mean	4.33	4.38	3.94	4.69	5.32
MIRM_03	mean	4.79	4.93	4.44	4.83	5.32

Collinearity is a very desirable outcome for the indicators of the individual constructs. However, it is a problem when the constructs have strong interdependencies. If such dependencies exist, the path coefficients cannot be reliably estimated (overestimation or underestimation of the individual effects). To check the relationships between the indicators in advance, an explorative factor analysis with varimax rotation was calculated in the hypothesised model (see chapter 7.5.2). The focus was on checking whether individual indicators also have relevant factor loads with other constructs. If such relevant factor load were present, this could provide information about possible collinearities. However, the exploratory factor analysis largely confirmed the confirmatory model for constructs and indicators.

7.4.2. Assessment of Outliers

Among others, Bollen (1987) and Dang and Serfling (2010) emphasise the value of outlier detection, which was discussed in Segment 6.1.2.. An outlier is "a case that does not follow the same model as the rest of the data" according to statistical methodologies (Weisberg, 2005, p. 194). When compared to other observations, such brief examples exhibit strong values. Statistical results may be biased as a result of outliers. However, there is no widely accepted specified threshold, therefore the decision of particular numbers for outliers is still up to the individual. The practise of identifying outliers for accurate conclusions may be used to provide accurate analytical findings, or if it is a valid single record, to identify it and delete it from the dataset to find a justification for their disorder. To discover and eliminate outsiders, reliable techniques are required to display most of the data correctly. It varies on a precise estimation of the distance and location of persons outside the data centre. There are various measurements of distance, but feasibly the most well-known are the Euclidean and Mahalanobis distances (Daszykowski et al., 2007). Based on the distance that Mahalanobis (1936) established, one of the first methods for measuring outliers exists: A measure between two data points in space determined by their unique properties is called the Mahalanobis distance (Xiang et al., 2008). The R Project statistical package has the Mahalanobis distance calculation, which is employed in this study to identify and rate the presence of outsiders. Figure 22 present the result of the calculation:

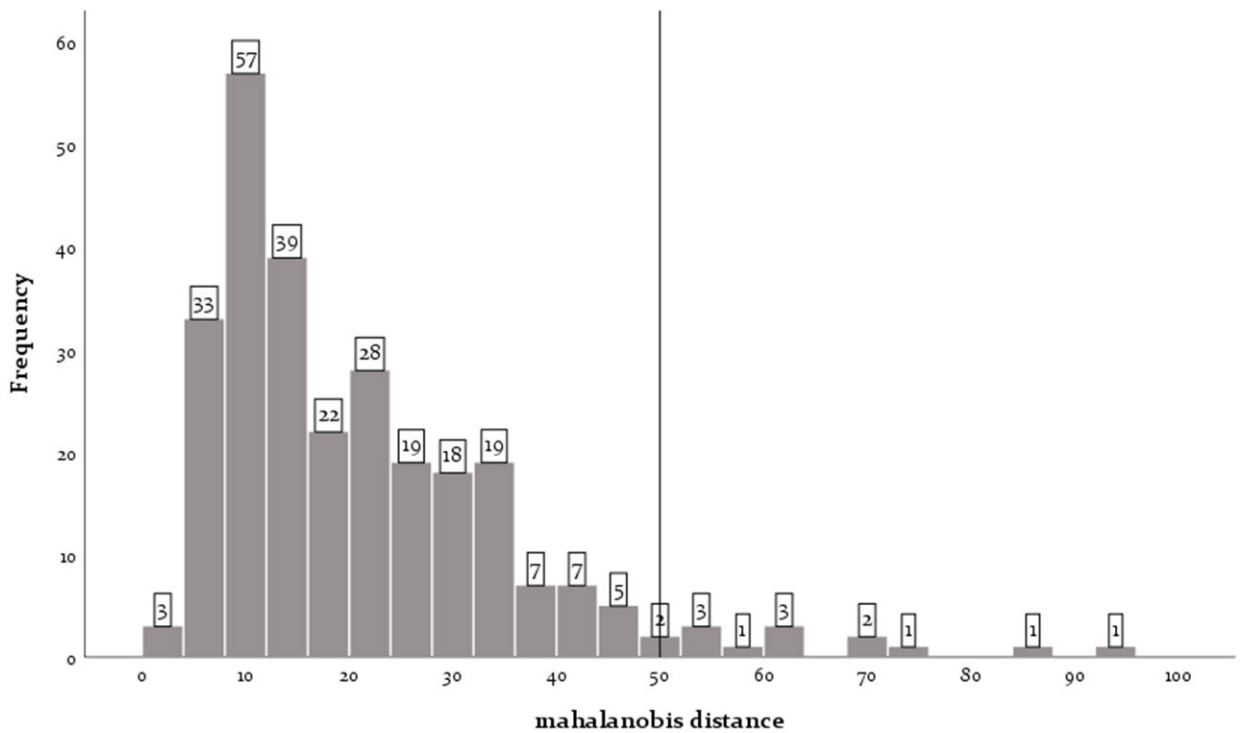
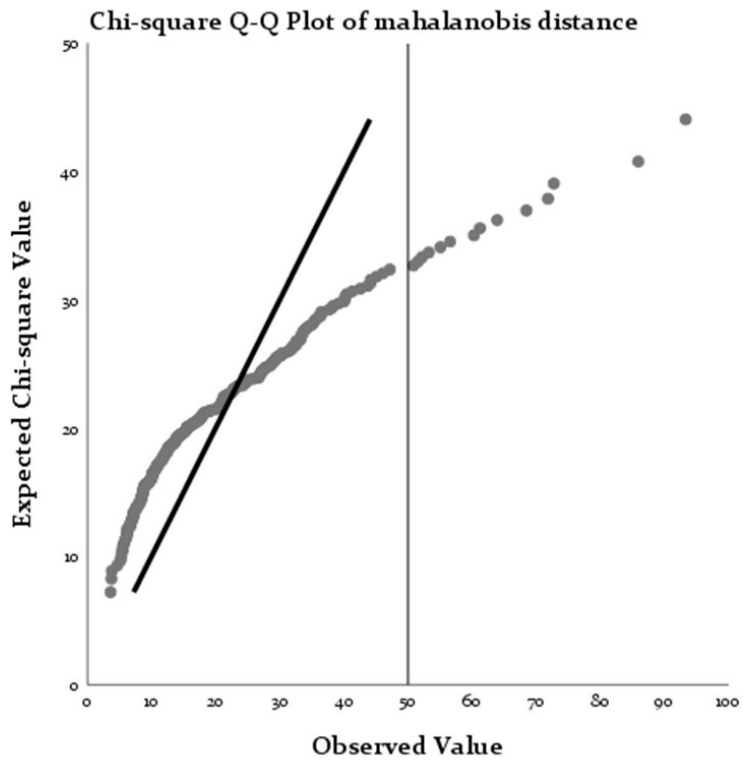


Figure 22 Q-Q Plot Mahalanobis distance measurement

The Q-Q plot shows that the dataset contained fourteen outliers with a Mahalanobis distance of > 50 (see Table 42). Further details displayed in Annex V.

outlier mahalanobis distance > 50	N	%
outlier no	257	94.8%
outlier yes	14	5.2%
total	271	100.0%

Table 42 Mahalanobis distance outlier

7.4.3. Construct Validity and model fit

The three criteria Fornell and Larcker (1981) set out for judging the convergent validity of all 20 assessment questions were: the reliability of each object measurement; the reliability of each construct; and the average variance recovered. During CFA, the factor loading of each item onto each of the seven latent constructs in the measurement model was calculated in order to assess the dependability of each measure's item. This was done using the SEM R Project. Because Cronbach's alpha tends to overstate dependability, composite reliability was employed at the concept level instead (Teo, 2009, p. 97). The average variance extracted measures how much variation is generally ascribed to the concept in contrast to how much variance is attributed to measurement error (Fornell & Larcker, 1981). A minimal factor loading of 0.50 was suggested by Tabachnick et al. (2001) as being appropriate, while Hair et al. (2006) recommend a composite dependability rating of 0.70 and above to be considered satisfactory. When the average extracted variance is equal to or greater than 0.50, convergence validity is sufficient (Segars, 1997). The link between an average variance shared between a concept and its assessed items that is higher than the variance shared between the block construct and other block constructs is known as discriminant validity (Fornell & Larcker, 1981).

The measurement model's goodness of fit was evaluated. The following metrics were generated to evaluate the model's fit to the data: χ^2 , χ^2/df , CFI, SRMR and RMSEA. Typically, goodness of fit values better than 0.9 are considered to be satisfactory (McDonald & Ho, 2002; Schreiber et al., 2006). Ratings equal to or higher than 0.95 are now commonly recognised as signs of good fit (Byrne, 2010; Korkmaz et al., 2014; Lei & Wu, 2007). Regarding RMSEA and SRMR, which measure 'badness-of-fit' (Gallagher et al., 2008; Hooper et al., 2008), values in the range of 0.05 to 0.08 for the former and 0 to 1 for the latter are typically seen as indicative of a good model fit. Table 43 lists the indicators and the criteria for each.

Model Fit Index	Recommended Values
χ^2	$p > 0.05$
χ^2/df	≤ 3.00
CFI	≥ 0.95
SRMR	≤ 0.08
RMSEA	< 0.08

Table 43 Indicated values for goodness for fit indexes

Source: (Browne et al., 1993; Byrne, 2010; Finney & DiStefano, 2006; Hu & Bentler, 1998; Kline, 2011; McDonald & Ho, 2002; Teo, 2009)

The pre-analysis methods presented above in Sections 8.4.1 to 8.4.3 (assessment of normality and collinearity, assessment of outliers, construct validity and model fit) met the basic expectations required for SEM. Therefore, the estimates of the parameters to be carried out in the SEM are asymptotically undistorted (that is, they neither overstate or underestimate the population's genuine characteristics) (Finney & DiStefano, 2006).

7.5. Structural Equation Modelling Results and Findings

Before describing the steps for conducting SEM analysis, a broad knowledge of the fundamental concept guiding its application is offered. The one-step and two-step techniques to modelling are the more straightforward ones, whereas the four-, five-, and six-step ways to modelling are the more challenging ones. The one-step technique involves doing a single analysis that simultaneously estimates a SEM model's structural and measurement components (Gallagher et al., 2008). Nevertheless, using the single analytic strategy results in concerns with misspecification (Bollen, 1987) and interpretational confounding (Burt, 1976).

However, the two-step approach describes a process where the measurement model, which represents the relationships between the latent and unobserved variables and their observed variables or indicators, is first estimated, and the structural model, which represents the relationships between the latent variables, is estimated in the second stage (Hair et al., 1998). If it is known that the measurement model is operating correctly, researchers may have higher confidence in the results pertaining to the assessment of the hypothesised structural model (Schumacker & Tomak, 2013). Consequently, this inquiry adopted a two-step process. According to Anderson and Gerbing (1988), the two-step modelling approach utilised in this work offers several comparative benefits, including the following:

- finds misspecification when there is interpretational confusion
- evaluates fundamental measurement model misclassifications
- enables testing for all pattern coefficients' significance
- evaluation of any structural model's ability to provide a good match; and
- an asymptotically independent test of the relevant theoretical or substantive model

It serves as a useful basis for formal comparisons between the most likely theoretical options and the corresponding substantive model. Respecifying of indicators was done in order to fix the problem of a poor overall model fit. Anderson and Gerbing (1988) suggested four fundamental strategies:

1. the indicator's association with a separate factor
2. taking the indicator out of the simulation
3. connecting the indicator to a number of elements and
4. measuring mistakes that are interrelated

The second method (taking the indicator out of the simulation) was chosen because it preserves the possibility of having a measurement that is only one dimension (Anderson & Gerbing, 1988).

7.5.1. Assessment of Measurement Model

The next step in the process was to evaluate how well the conceptual model represented the data after addressing the problem regarding the important assumptions required for SEM (as given in Section 7.4). The obtained indicator variables (items on the measuring instruments) were then compared to their corresponding latent structures to gauge how well the measurement model performed. Based on the two-stage SEM method utilised in this investigation, this was accomplished (unobserved variables). If the outcomes did not lead to a good fit, the measurement model in the CFA had to be changed. If an item had a significant residual variance with other items, it had to be eliminated one at a time (Sørenbø & Eikebrokk, 2008). The procedures are followed in accordance with the accepted procedure for covariance-based structural equation modelling (Gefen et al., 2000). The statistics utilised in the SEM model are described in Table 44.

statistic	description
est.std	standardized path coefficient
z_value	z-statistic
pvalue	Significance value

Table 44 Explanations SEM model

7.5.2. Hypothesized model

The observed measurement items and variables from the CFA, as explained in Chapter 6, were used to create the proposed causal model. Table 45 displays the results of the measurement hypothesis model for the model fit.

Statistic	χ^2	df	p-value	χ^2/df	RMSEA	SRMR	CFI
Recommended values			> 0.05	≤ 3.00	< 0.08	≤ 0.08	≥ 0.95
Hypothesized model	476.10	168	0.000	2.83	0.08	0.07	0.86

Table 45 Model fit for hypothesized model

The hypothesized model does not meet the defined fit criteria, and while the RMSEA is just above the edge, CFI (0.86) is not achieved.

In Table 46 the covariance of the hypothesized model is analysed.

latent	ALD	AMS	APDCC	ALOUR	PBC	SP	MIRM	avevar	alpha	cov_max
ALD		0.294	0.192	0.175	0.191	0.254	0.384	0.559	0.762	0.294
AMS	0.294		0.285	0.480	0.745	0.474	0.720	0.490	0.738	0.745
APDCC	0.192	0.285		0.197	0.181	0.198	0.303	0.415	0.658	0.285
ALOUR	0.175	0.480	0.197		0.675	0.287	0.483	0.571	0.786	0.675
PBC	0.191	0.745	0.181	0.675		0.327	0.538	0.546	0.774	0.745
SP	0.254	0.474	0.198	0.287	0.327		0.399	0.404	0.664	0.474
MIRM	0.384	0.720	0.303	0.483	0.538	0.399		0.644	0.805	0.720

Table 46 Covariations hypothesized model

The alpha values are satisfactorily high, only for APDCC and SP the target criterion (0.70 for three indicators) is barely achieved. The Fornell Larcker criterion is also problematic. The critical constructs here are AMS, ALOUR and PBC. The high covariation between PBC and ALOUR (0.67) as well as PBC and AMS (0.74) is noticeable, an indication of a collinearity problem between the mentioned constructs.

Table 47 shows the standardised factor loadings and Table 48 the CFA of the hypothesised model:

Construct	Indicator	est.std	z_value	pvalue
ALD	ALD_01	0.571	11.769	0.000
ALD	ALD_04	0.821	22.969	0.000
ALD	ALD_05	0.773	20.613	0.000
AMS	AMS_01	0.668	15.261	0.000
AMS	AMS_03	0.761	19.660	0.000
AMS	AMS_04	0.677	15.676	0.000
APDCC	APDCC_01	0.500	8.680	0.000
APDCC	APDCC_02	0.656	12.918	0.000
APDCC	APDCC_04	0.731	14.969	0.000
ALOUR	ALOUR_02	0.753	20.658	0.000
ALOUR	ALOUR_03	0.668	16.054	0.000
ALOUR	ALOUR_04	0.817	24.614	0.000
PBC	PBC_01	0.698	17.505	0.000
PBC	PBC_03	0.733	19.499	0.000
PBC	PBC_04	0.774	22.060	0.000
SP	SP_01	0.521	9.340	0.000
SP	SP_03	0.717	15.173	0.000
SP	SP_04	0.647	13.022	0.000
MIRM	MIRM_01	0.862	33.373	0.000
MIRM	MIRM_02	0.920	38.742	0.000
MIRM	MIRM_03	0.518	10.809	0.000

Table 47 Standardised factor loadings hypothesised model

	AMS	ALOUR	ALD	APDCC	SP	PBC
AMS_04	0.757		0.108	0.213		0.139
AMS_03	0.744	0.162	0.167		0.203	
AMS_01	0.725				0.175	0.149
PBC_01	0.526	0.319				0.494
ALOUR_04	0.110	0.813		0.117	0.131	0.196
ALOUR_02		0.795				0.262
ALOUR_03	0.228	0.759	0.151	0.121		
ALD_05			0.809	0.192	0.140	
ALD_01	0.214	0.126	0.770			
ALD_04			0.762	0.210	0.334	0.143
APDCC_04			0.205	0.755	0.215	0.132
APDCC_02	0.256	0.176		0.748		0.177
APDCC_01				0.700	0.116	-0.147
SP_01			0.202		0.794	
SP_03	0.353	0.221		0.184	0.691	
SP_04	0.251		0.176	0.199	0.632	
PBC_04	0.260	0.190				0.838
PBC_03	0.116	0.302	0.128		0.178	0.762

Table 48 CFA hypothesised model standardised factor loadings, loadings with ABS < 0.100 suppressed

As a next step, followed the recommendations of Anderson and Gerbing (1988), is to improve the basic model by removing critical indicators. Rule (1) is not applicable, because there is always a high factor load of an indicator with the hypothesised construct.

Following rule is applied to take out the indicators regarding their priority:

- 1) Eliminate indicators that have exploratory factor loads with other constructs as well.
Objective: Reduce the collinearity between the constructs and improve the fit criteria.
- 2) Eliminate indicators with low standardised factor loadings. Objective to improve the fit criteria.
- 3) The minimum number of 2 indicators per construct must be retained.

There may be certain problems if a construct has two measurement components (Anderson & Gerbing, 1988). Additionally, every single measure (indicator) is supposed to represent an estimate of only one construct, and each estimated construct of the multiple-indicator measurement models should be characterised by at least two measurements (indicators or latent variable), according to Anderson and Gerbing (1988). Two to six indicators are often used in SEM experiments for each latent variable (Gerbing & Anderson, 1992). Similar results were found in a research by Ding et al. (1995), who hypothesised that two to five markers are often sufficient for each latent variable in SEM investigations. This is supported by Bollen and Davis (2009), who recommended that each latent variable have at least two measurable indicators. Amorim et al. (2010) asserted that each latent variable should have at least two exclusive indicators (Kline, 2011, p. 359); Kline (2016) specified that two indicators per latent variable

is the procedural minimum requirement. The technical minimum for the measurement items per concept was reached since this research produced a measurement model that investigates and fulfils the specified requirements, with a minimum of two measurement items.

In Table 49 the removal of the indicators is explained:

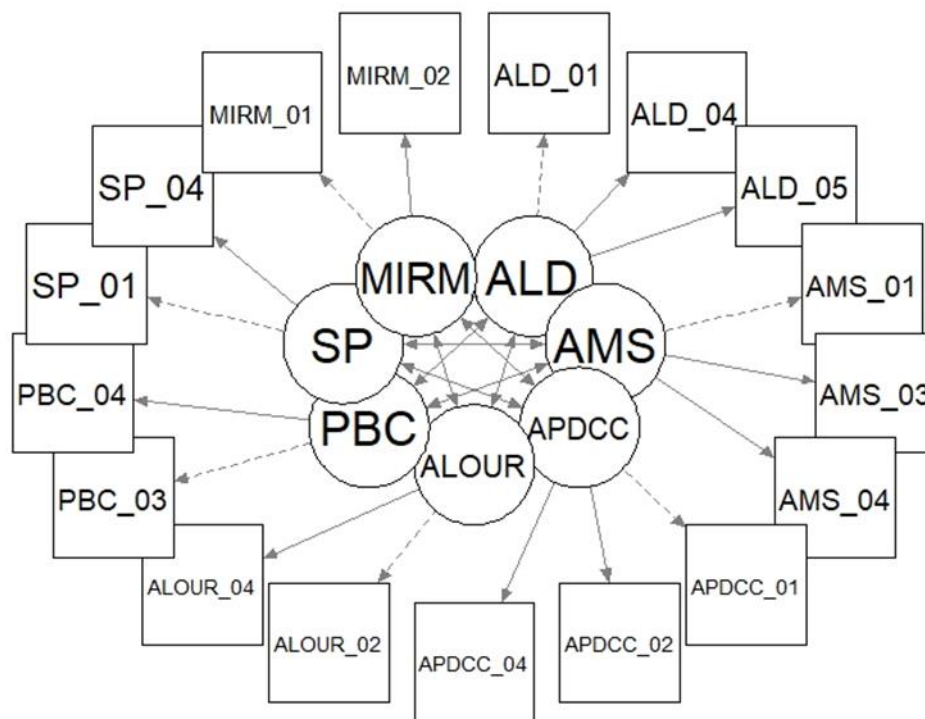
Indicator	Explanation
PBC_01	High exploratory loading with AMS (0.526) and ALOUR (0.319)
SP_03	High exploratory loading with AMS (0.353) and ALOUR (0.221)
ALOUR_03	High exploratory loading with AMS (0.228)
MIRM_03	Low standardized loading (0.518)

Table 49 Eliminated indicators by priority

In the next chapter the reduced measurement model will be displayed.

7.5.3. Re-specifying the Measurement Model

The investigation then used an exploratory strategy to identify the parameter(s) of the measurement model that was hypothesised to be incorrectly stated. Several factors, including theoretical, statistical, and practical aspects, were taken into account in determining the suitability of the model (Schumacker & Tomek, 2013). Figure 23 illustrates:



Coding: AMS - attitude of management support, ALOUR - attitude of level of understanding for relocation management, APDCC - attitude of perceived development of core competences, ALD - attitude of the motivation for localisation driver, SP - social

pressure, PBC - perceived behaviour control, MIRM - managers intention toward relocation mode choice.

- Covariations double arrows between the constructs (circle to circle)
- Loadings single arrows from construct to indicator (circle to rectangle)
- Residual variances Suppressed

Figure 23 MM2 The respecified measurement model

Table 50 displays the standardized factor loadings and Table 51 the covariation of the respecified model:

	χ^2	df	p-value	χ^2/df	RMSEA	SRMR	CFI
model			> 0.05	≤ 3.00	< 0.08	≤ 0.08	≥ 0.95
MM 1	476.1	168.0	0.000	2.83	0.08	0.07	0.86
MM 2	174.1	95.0	0.000	1.83	0.06	0.04	0.95

Table 50 Model fit for respecified model (MM 2)

latent	ALD	AMS	APDCC	ALOUR	PBC	SP	MIRM	avevar	alpha	cov_max
ALD		0.323	0.173	0.160	0.232	0.318	0.354	0.554	0.762	0.323
AMS	0.323		0.284	0.444	0.683	0.410	0.650	0.489	0.738	0.683
APDCC	0.173	0.284		0.197	0.203	0.212	0.304	0.422	0.658	0.284
ALOUR	0.160	0.444	0.197		0.726	0.253	0.428	0.633	0.774	0.726
PBC	0.232	0.683	0.203	0.726		0.293	0.541	0.603	0.745	0.726
SP	0.318	0.410	0.212	0.253	0.293		0.307	0.391	0.530	0.410
MIRM	0.354	0.650	0.304	0.428	0.541	0.307		0.810	0.887	0.650

Table 51 Covariation of the respecified model

The respecified model meets all fit criteria except for the Fornell Larcker criterion. The high covariation between the constructs PBC, ALOUR and AMS is still present, with particularly high covariation results for PBC and ALOUR (0.726). Individual low avevar values and the high covariation mean that the Fornell Larcker criterion is not achieved for all constructs, especially PBC and ALOUR. A further elimination of indicators to reduce the covariation is not possible because the affected constructs (PBC and ALOUR) have already reached the minimum number of indicators.

Although the fit criteria are met, there are still high covariances in the modified measurement model, meaning that the uni-dimensionality of the individual constructs, which was postulated in the original model, is only given to a limited extent. For the PBC construct in particular, strong connections to the ALOUR and AMS constructs can be demonstrated.

If the modified measurement model were to be supplemented by the postulated regression term with regard to MIRM, that would mean that to evaluate the postulated structural model, the effects of the critical constructs ALOUR and PBC on MIRM would be underestimated, since these constructs are adjusted for the covariation between each other (see table path coefficients

SM 1). In a common structural model, a significant influence on MIRM can no longer be demonstrated for both ALOUR and PBC.

The following procedures are possible to achieve the model fit:

- 1) Rejection of the uni-dimensionality hypothesis of the individual constructs by redefining the measurement model, which instead of the two individual constructs would contain a common construct from PBC and ALOUR. This procedure is rejected due to content considerations and the strong deviation from the postulated measurement model with the two individual constructs.
- 2) Elimination of one of the two critical constructs from the measurement model. Since PBC and ALOUR are practically unidimensional due to the high covariation, one of the two constructs could be dispensed with in the measurement model. The construct that better fulfils the fit criteria and the Fornell Larcker criterion would then have to be used for the final measurement model. With this approach, however, only the effect of PBC or the effect of ALOUR on MIRM could be checked, since one construct would fall out completely. This would represent a strong deviation from the originally postulated measurement model.
- 3) Calculation of two separate structural models for PBC and ALOUR, whereby for the PBC model, ALOUR is excluded as an independent construct and *vice versa* for the ALOUR model, where PBC is excluded as an independent construct. By analysing two separate structural models, the postulated hypotheses regarding MIRM are largely retained and a separate estimate of the effects PBC and ALOUR on MIRM is possible. The disadvantage is that separate effects would be estimated for the other constructs contained in both structural models (AMS, ALD, APDCC and SP), e.g.: B. AMS effect depending on ALOUR (ALOUR model) and AMS effect depending on PBC (PBC model). Due to the high covariation between PBC and ALOUR, these effects should only differ slightly.

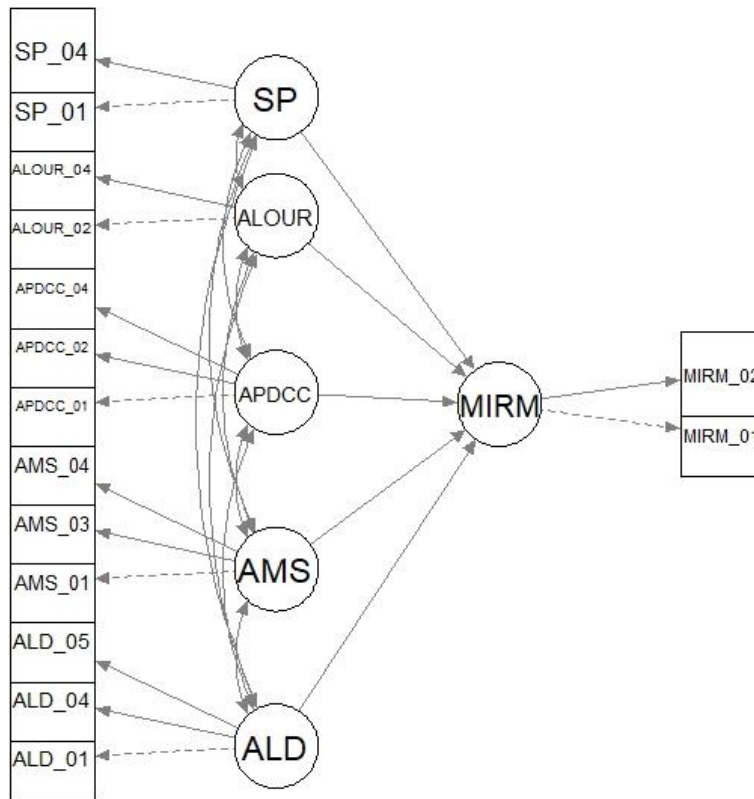
7.5.4. Assessment of Structural Model

After weighing the content and statistical aspects, variant three was applied to test the hypotheses regarding MIRM. To test the effect of the constructs AMS, ALD, ALOUR, APDCC, PBC and SP, three final structural models were analysed (Table 52).

Model short	model long
SM 1	Structural model including PBC and ALOUR
SM 2	Structural model including ALOUR
SM 3	Structural model including PBC

Table 52 Overview structural models

Figure 24 displays the findings of the examination of the SM 2 model $\chi^2/df=1.75$, CFI=0.96, RMSEA=0.05 and SRMR=0.04 were the goodness of fit metrics.

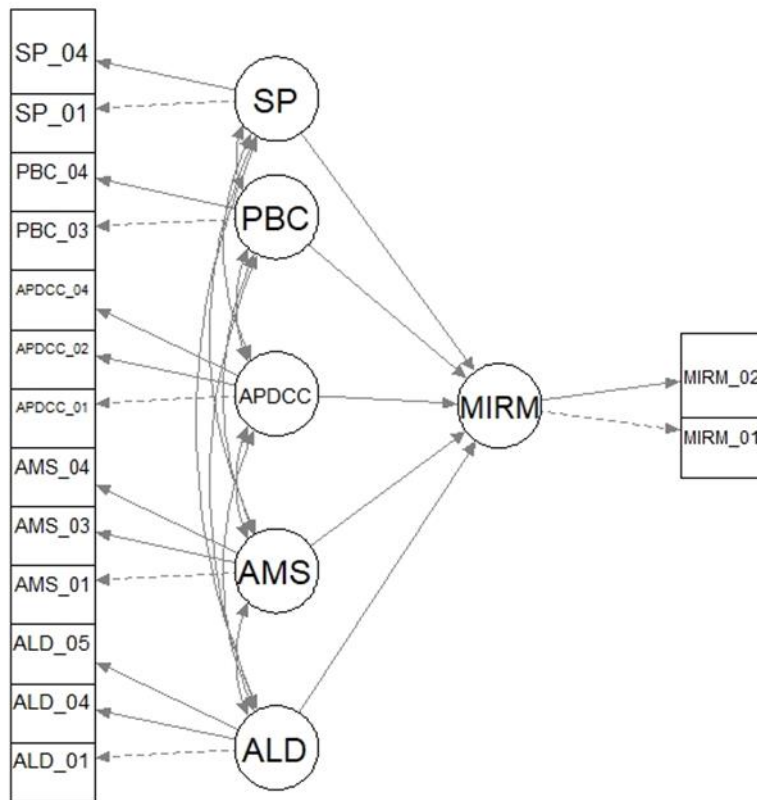


Coding: AMS - attitude of management support, ALOUR - attitude of level of understanding for relocation management, APDCC - attitude of perceived development of core competences, ALD - attitude of the motivation for localisation driver, SP - social pressure, MIRM - managers intention toward relocation mode choice.

- Covariations double arrows between the constructs (circle to circle)
- Loadings single arrows from construct to indicator (circle to rectangle)
- Hypotheses single arrows from constructs to MIRM (circle to circle)
- Residual variances suppressed

Figure 24 SM2 structural model with ALOUR and without PBC

Figure 25 displays the findings of the examination of the SM 3 model. $\chi^2/df=2.00$, CFI=0.95, RMSEA=0.06 and SRMR=0.04 were the goodness of fit metrics.



Coding: AMS - attitude of management support, APDCC - attitude of perceived development of core competences, ALD - attitude of the motivation for localisation driver, SP - social pressure, PBC - perceived behaviour control, MIRM - managers intention toward relocation mode choice.

- Covariations double arrows between the constructs (circle to circle)
- Loadings single arrows from construct to indicator (circle to rectangle)
- Hypotheses single arrows from constructs to MIRM (circle to circle)
- Residual variances suppressed

Figure 25 SM3 structural model with PBC and without ALOUR

The best model is the SM 2 with ALOUR and without PBC. It fulfils all requirements. The SM 3 model with PBC and without ALOUR does not meet the Fornell Larcker criterion. A summary is displayed in Table 53:

	χ^2	df	p-value	χ^2/df	RMSEA	SRMR	CFI
model			> 0.05	≤ 3.00	< 0.08	≤ 0.08	≥ 0.95
SM 1	174.1	95.0	0.000	1.83	0.06	0.04	0.95
SM 2	126.3	72.0	0.000	1.75	0.05	0.04	0.96
SM 3	143.9	72.0	0.000	2.00	0.06	0.04	0.95

Table 53 Model fit structural models

In Table 54 the confirmed and tested hypothesis out of the SEM are displayed.

Hypo	Construct	SM 1			SM 2			SM 3		
		est.std	z_value	pvalue	est.std	z_value	pvalue	est.std	z_value	pvalue
H1	AMS	0.246	2.669	0.008	0.295	3.626	0.000	0.245	2.651	0.008
H2	ALOUR	0.086	0.936	0.349	0.133	1.917	0.055			
H3	APDCC	0.241	2.789	0.005	0.241	2.771	0.006	0.252	2.950	0.003
H4	ALD	0.254	2.779	0.005	0.262	2.855	0.004	0.252	2.761	0.006
H5	PBC	0.125	1.184	0.236				0.167	2.088	0.037
H6	SP	-0.116	-0.925	0.355	-0.115	-0.918	0.359	-0.107	-0.859	0.391

Table 54 Hypothesis summary SEM model

Based on the SM 2 and SM 3 models, the following important drivers for MIRM result for the inner model:

- AMS: the higher the AMS, the higher the offshoring intention
- ALD: the higher the ALD, the higher the offshoring intention
- APDCC: the higher the APDCC, the higher the offshoring intention
- PBC: significant, the higher the PBC, the higher the offshoring intention.
- ALOUR: slightly not significant (0.055), tendency positive.
- SP: not significant. Negative tendency, d. H. the higher the SP, the lower the offshoring intention.

The structure variables are all not significant. Looking at the SM 1 model with ALOUR and PBC, it emerges that a significant connection with MIRM cannot be demonstrated for both constructs. The reason for this is the high covariance between the two constructs (see discussion of possible solutions).

7.5.5. Robustness

The bootstrapping approach was used to deal with the existence of multidimensional nonnormal data (Bollen & Stine, 1992). General data that is not regularly distributed should have five or more categories as a minimum requirement for bootstrapping (Finney & DiStefano, 2006). The survey employed a seven-point Likert scale, therefore the results can adopt the bootstrapping approach. As a resampling technique, bootstrapping is commonly used to construct an empirical distribution of model test statistics that accounts for the non-normality of the data (Finney & DiStefano, 2006). When using the Bootstrap approach, the SEM R Project utilised in this study displays the appropriate chi square p value. Corresponding to Nevitt and Hancock (2000), the bootstrapping optimisation approach shows that it handles Type I errors under nonnormal and certain sets of model specification.

The bootstrap values for Chi-Square and p-value calculated with the help of the Bollen-Stine method based on 1000 samples show improved values, smaller Chi-Square value, and larger p-value. As a supplementary robustness test, the two final structural models (SM 2 and SM 3) were calculated without the 14 outliers. Here, too, there were only minimal changes with regard to the fit criteria; the calculated fit criteria remain stable.

This means that the results presented are meaningful despite the deviation from the normal distribution and a few critical outliers, as displayed in Table 55 and Table 56.

model	model		Boot strap	
	χ^2	p-value	χ^2	p-value
SM 2	126.27	0.000	104.70	0.007
SM 3	143.90	0.000	105.07	0.007

Table 55 Robustness model fit Bollen-Stine bootstrap with 1000 samples

Hypo	Construct	SM 2		SM 3		result
		est.std	pvalue	est.std	pvalue	
H1	AMS	0.306	0.006	0.248	0.038	sig yes
H2	ALOUR	0.155	0.160			sig no
H3	APDCC	0.514	0.022	0.571	0.004	sig yes
H4	ALD	0.455	0.012	0.467	0.006	sig yes
H5	PBC			0.191	0.072	sig no
H6	SP	-0.206	0.424	-0.242	0.438	sig no

Table 56 Robustness model hypotheses, Bollen-Stine bootstrap with 1000 samples

Based on the Bollen-Stine bootstrap, there are no significant hypotheses for ALOUR and PBC.

Having calculated the Bollen-Stine bootstrap without the 14 outliers, there is a significant hypothesis for ALOUR (Table 57).

Hypo	Construct	SM 2			SM 3			result
		est.std	z_value	pvalue	est.std	z_value	pvalue	
H1	AMS	0.223	2.940	0.003	0.179	2.086	0.037	sig yes
H2	ALOUR	0.168	2.618	0.009				sig yes
H3	APDCC	0.227	3.006	0.003	0.245	3.305	0.001	sig yes
H4	ALD	0.246	3.117	0.002	0.221	2.785	0.005	sig yes
H5	PBC				0.183	2.347	0.019	sig yes
H6	SP	0.067	0.642	0.521	0.072	0.691	0.489	sig no

Table 57 Robustness model hypotheses, models without 14 outliers

7.6. Multinomial logit model with three-level target variable results

A reduced data set is used to analyse the relationships with regard to the target variable MDRU. Subjects with missing information on MDRU and subjects without offshore activities are excluded. A total of 30 subjects (11.4%) (see Table 58).

Target variable MDRU offshoring activities	N	%
external (reference group)	102	42.3%
internal	104	43.2%
concurrent	35	14.5%
total	241	100.0%

Table 58 Dataset for target variable MDRU

In the context of econometric modelling, a multinomial logistic regression model is used with the following simplified regression equation:

$$y = f(\text{structure variables, construct MIRM})$$

where y defines the multi-nominal target variable MDRU with a total of three categories. The reference category is the external offshoring activities. The other two categories (internal / concurrent) define the comparison categories relevant to the evaluation. The choice of the reference group defines which deviations are shown and checked for significance. As part of the analysis, they are:

- Internal deviations versus reference group
- Deviations from the concurrent versus reference group

f defines the link function, here the logit function

MIRM represent the major main influencing variable (H7) for this study. MIRM is based on the CFA factor scores of the final SEM models of the internal analysis model. The standardised variables used to calculate the CFA factor scores have a mean of 0 and a standard deviation of 1. Furthermore, other evaluation-relevant structural features are also considered as potential influencing variables in the outer model, these are: type of control, company size, and experience. Type of control and company size are represented as dichotomous influencing variables.

The potential relevance of all defined influencing variables (structural variables and MIRM) for the final estimation model was examined in the context of preliminary analysis.

In a first step, a bivariate preliminary analysis was carried out, that means first, a multinomial logit regression model was estimated separately for each influencing variable in order to analyse the individual effects of the potential influencing variables on the offshoring activities.

In the second step, the multivariate analysis was carried out to model the common relationship between all potential influencing variables and the target variable MDRU. The multivariate analysis was based on modelling based on a step-by-step selection of variables. This procedure was required to be able to control possible collinearities between the constructs. This will be mentioned again in the context of the hypotheses of the internal analysis model.

statistic	description
B	Estimated difference between reference group and comparison group, pairwise comparison
Sig	Significance for group differences between reference group and comparison group
Sig LR	Significance of the influencing variable globally
R ²	Fit criterion according to Nagelkerke

Table 59 Explanations of logit model

variable	internal vs external		concurrent vs external		Sig LR	R ²	hypothesis
	B	Sig	B	Sig			
B01_kl	0.085	0.771	-0.285	0.478	0.658	0.004	H8 not family owned yes
B02_kl	0.521	0.110	0.521	0.273	0.225	0.014	H8 company size > 300 yes
C02	0.153	0.196	0.361	0.033	0.083	0.024	H8 experience
MIRM	0.353	0.007	0.525	0.007	0.003	0.054	H7

Table 60 Logit model step 1: Bivariate analysis

The result of bivariate analysis shows that for the three structural variables “type of control”, “company size” and “experience”, a significant relationship with regard to offshore activities cannot be demonstrated (Table 60).

In Step two, multivariate analysis, the final model contains the construct MIRM as the only relevant influencing variable (Table 61).

variable	internal vs external		concurrent vs external		Sig LR	R ²
	B	Sig	B	Sig		
MIRM	0.353	0.007	0.525	0.007	0.003	0.054

Table 61 Logit model step 2: Multivariate analysis

variable	internal vs external		concurrent vs external		Sig LR
	B	Sig	B	Sig	
B01_kl	0.070	0.815	-0.288	0.490	0.683
B02_kl	0.411	0.220	0.424	0.391	0.419
C02	0.140	0.247	0.342	0.049	0.124

Table 62 Logit model step 2: Multivariate analysis variables not included

Based on the relation between MIRM and MDRU, the main hypothesis H7 is significant and supported. The structure variables of for the hypothesis H8 are not significant and therefore not supported (Table 62).

7.7. Correlational Core Competence Cluster

independent	dependent	Correlation	n	Lower C.I.	Upper C.I.	sig
APDCC_03_01	MIRM	0,185	271	0,067	0,298	0,002
APDCC_03_02	MIRM	0,168	271	0,050	0,282	0,005
APDCC_03_03	MIRM	0,144	271	0,026	0,259	0,017

Table 63 Correlations APDCC_3 with MIRM

Based on the relationship between the three APDCC_3 variables and MIRM, significance is found, but with a weak correlation factor (correlation <0.3) (Table 63).

7.8. Hypotheses Summary of both models

Once an overall fit between the inner and outer models had been achieved, the developed hypotheses (which were founded on the conceptual model) are summarised in Table 64:

independent -> mediating -> dependent (variable)**	Path	Hypothesis	Result
AMS -> MIRM (-> MDRU)	external versus internal	H1a	Supported
AMS -> MIRM (-> MDRU)	external versus concurrent	H1b	Supported
AMS -> MIRM (-> MDRU)	concurrent versus internal	H1c	Not tested
ALOUR -> MIRM (-> MDRU)	external versus internal	H2a	Supported*
ALOUR -> MIRM (-> MDRU)	external versus concurrent	H2b	Supported*
ALOUR -> MIRM (-> MDRU)	concurrent versus internal	H2c	Not tested
APDCC -> MIRM (-> MDRU)	external versus internal	H3a	Supported
APDCC -> MIRM (-> MDRU)	external versus concurrent	H3b	Supported
APDCC -> MIRM (-> MDRU)	concurrent versus internal	H3c	Not tested
ALD -> MIRM (-> MDRU)	external versus internal	H4a	Supported
ALD -> MIRM (-> MDRU)	external versus concurrent	H4b	Supported
ALD -> MIRM (-> MDRU)	concurrent versus internal	H4c	Not tested
SP -> MIRM (-> MDRU)	external versus internal	H5a	Not supported
SP -> MIRM (-> MDRU)	external versus concurrent	H5b	Not supported
SP -> MIRM (-> MDRU)	concurrent versus internal	H5c	Not tested

PBC -> MIRM (-> MDRU) external versus internal	H6a	Not supported
PBC -> MIRM (-> MDRU) external versus concurrent	H6b	Not supported
PBC -> MIRM (-> MDRU) concurrent versus internal	H6c	Not tested
MIRM -> MDRU	H7	Supported
PBC*** -> MDRU	H8	Not supported

Note: * significant without 14 outliers, ** combination of SEM & multi logit model
 ***(only structural variables)

Table 64 Hypotheses summary of SEM and MNL model

The eight hypothesis that make up the established conceptual model in total describe the causal connections between the eight main constructs.

7.9. Chapter conclusion

The main study's findings were presented in this chapter. In order to evaluate whether the data were sufficient for the analysis using SEM, a series of pre-analytical evaluations were first performed on the data gathered from the primary research. The measurement model was evaluated for CFA, and as a result the model was changed and re-specified. The structural model was then evaluated and modified. Multiple goodness of fit metrics were used to test and evaluate the measurement model and structural model. MNL were used to show the link between the dependent nominal variable and one or more continuous independent variables. There were a number of values (classes) of the dependent variable, “external”, “internal” and “concurrent”. Finally, the research's hypotheses (see section 4.6) were put to the test. The focus of the next chapter will be on the analysis and implications of the findings and conclusions obtained from this study's statistical analysis.

8. Discussion

The findings of data collection from businesses in the high-tech vacuum industry in the DACH area are discussed in this chapter. It takes into account the appropriate statistical analysis of the data, using the specified Structural Equation Modelling (SEM) and Multi Logit Model (MNL). Following the introduction of the business environment, the two further parts (B & C) of the questionnaire are offered, followed by a discussion of the participants' understanding of these important ideas. After that, the hypotheses and their significance-level connections amongst the independent and dependent variables are presented. The results of the data analysis procedure will be discussed for each of the routes and elements of the conceptual model (see Chapter 5.8). A schematic description of the main ideas in this chapter is shown in Figure 26.

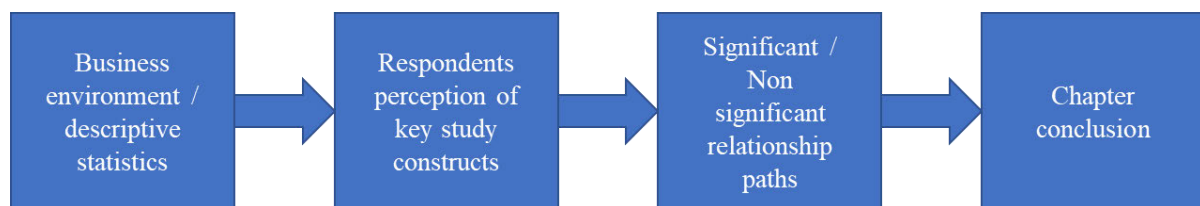


Figure 26 Schematic overview of discussion chapter

8.1. Business Environment of this study

Representatives from registered organisations in the DACH region working in the vacuum industry made up the survey sample, highlighting the focus on several business criteria important for this study in the area of SCPRM. Between the beginning of May 2021 and the end of June 2021, a representative sample selected using proportional random sampling was surveyed. In 2021, the relevant data analysis and interpretation were carried out. The statistics were gathered in Germany, Austria, Switzerland, and Liechtenstein, and the chosen businesses constitute a significant portion of the region's total economy. It is acceptable to draw the conclusion that the sample's representativeness in this study provides a solid foundation for properly extrapolating its findings to high-tech equipment. Section 9.3 explains the study's limitations.

Vacuum equipment, combined with its sub-components, makes up the biggest cost in terms of materials for semiconductor OEMs. For example, the semiconductor industry consumed almost \$2.7 billion worth of vacuum subsystems in 2020, with over 60% supplied by vendors with headquarters based in Europe. Substantial share gains by MNL companies in the DACH region have contributed to Europe stretching its lead over Japanese suppliers, which have been stuck at 22% for several years. The large volumes of huge vacuum components such as chambers now being shipped each year, combined with near double-digit growth rates, favour the larger suppliers of vacuum subsystems. This shows the momentum is with European suppliers as they have the resources to scale up rapidly and the funds to finance the research and development effort required to stay ahead of their customers' needs.

Europe and the DACH Region has a central role in mechanical engineering worldwide, which is only competed by Japan. In the new world order dominated by China / USA, Europe must defend at least its existing strong positions with the support of a politically and economically strong Europe. Excellent and complementary solutions from the European machine industry are supporting this approach. However, successful companies in the DACH region are threatened: Young mechanical engineering competitors from the emerging Asian countries as well as large software players and internet platforms are pushing into the core business. The increasing "country first" tendencies of many countries, including China (Huimin et al., 2018), raise fears of the emergence of export barriers. New digital technologies and business models can cause change and become disruptive at any time, to name just a few of the possible threats. The coronavirus pandemic has also shown that seemingly unlikely threats must be taken seriously - and that they are ours all thinking and acting almost overnight determine and change permanently. That expands the range of factors that must be taken into account when assessing future developments in vacuum industry.

8.2. Discussion About Descriptive Statistics

In order to have a complete image of the research environment, data were gathered about the primary reasons for performing relocation management, which were the study's emphasis. In order to increase the competitiveness of their organisation, participants in the survey should have performed relocation management actions, and this section evaluates those two extra questions as well.

8.2.1. Main reason for doing relocation management in your organisation

The section requested participants to select the reasons for doing relocation management in their organisations. "Operational requirements such as production, quality, cost reduction, etc." (80%) and "Pressure from consumers or the market" (60.6%) were the most commonly cited reasons.

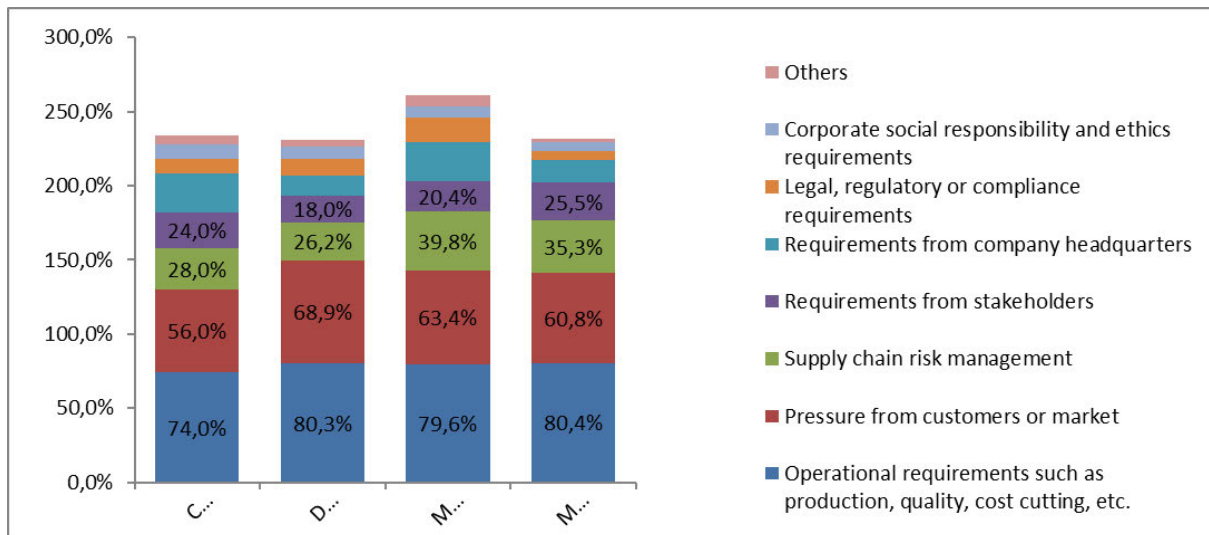


Figure 27 Main Reason for Doing Relocation Management

This met expectations since operational needs are a top priority for many enterprises worldwide. They are an essential component of management and are a part of a bigger function that is distinctive of choices made by high-tech organisations. Such choices must always be made to maximise levels of cost, quality, and time in combination with relocation management in the supply chain and operations. They are an essential component of SCPRM processes. As Mihalache and Mihalache (2016) highlighted, the popularity of cost-saving is so entrenched in relocation that some studies even define relocation as a cost-reduction strategy. The second selection, "Pressure from customers or the market," can be attributed to increased awareness of the customer-market interface and expanded regulatory requirements (explained in section 1.5.6), both of which apply to businesses that must use a formal approach to relocation management. At the very least, these businesses must adhere to laws and regulations, be socially and ethically responsible, and act in accordance with their values. As for doing relocation, the supply chain and operational environment is dynamic and constantly evolving with various hazards, unforeseen events, and unforeseen effects, and the legal and regulatory environment has grown steadily around the world. Shoring is not a final decision. It is important to constantly re-evaluate the relocation location, and to ensure capability to shift or change location. It is a continuous requirement for companies to increase mindfulness and control: systematise information management, focus on quality control, determined by common public awareness (Johansson & Olhager, 2018).

8.2.2. Discussion About the survey participants

The survey identified C-level executives (19.7%), Department Heads/Heads of Supply Chain/Procurement, etc. (23.9%), Senior Management level/Supply Chain/Manager/Procurement Manager (36.7%), and Middle Management/Procurement Officer/Supply Chain Officer, etc. (19.7%) as key implementers of SCPRM who also have connections within their particular organisations. Assumptions were made that those in C-level

and board-level positions would probably have a large effect on SCPRM activities and would have the largest overall perspective on their organisation's SCPRM endeavours. Middle Management was anticipated to have a substantial influence on operational SCPRM procedures, as well as Procurement Officers and Supply Chain Officers.

With more than 50% of respondents (56,4%) reporting to be in C-level and senior management-level positions and the remaining 44% holding positions as department heads, middle management, procurement officers, and supply chain officers, the combination of survey participants was suitable and characterised the primary functions within the specific communities and groups. It was assumed that C-level and management-level workers would be more involved in operational SCPRM practices, whereas the other categories were more likely to pay attention to strategic SCPRM practices from both an operational and strategic viewpoint on relocation management. Equally, every group is properly represented (Annex IV).

More than 40% (40.2%) of participants reported having three to ten years' worth of SCPRM experience, while more than 25% (22.8%) had more than ten years' worth. This shows a respectable mix of relocation management expertise across the study's participants.

Figure 51 in Annex IV depicts how information on the respondents' four distinct business grouping positions in respect to their years of relocation management expertise was organised. High levels of experience (>10 years=35.6%) were stated by C-level responders. In other words, the greatest rank and most experience were correlated, whereas the lowest rank and less experience were correlated (>10 years=20%). Four age groups of participants were created: those under 30 (2.3%), in their 30s (10.6%), in their 40s (36.7%), and in their 50s and above (50.4%). Figure 52 in Annex IV shows the findings of a comparison between the four age groups and the number of years they claim to have had relocation management experience in Annex IV. Figure 52 shows a possible curve, and the predicted tendency is apparent. The oldest age group (50 years and above) reported having the most relocation management expertise. Figure 53 in Annex IV shows the results of an investigation into the relationship between participants' highest stated levels of education and years of relocation management experience. The participants with the greatest levels of education also appeared to have the most relocation management experience, according to the apparent pattern. Figure 54 in Annex IV shows the results of an investigation to show the relationship between participant age and job status. The association between age and position in the organisation did not reveal any unexpected findings. Figure 55 in Annex IV shows the results of an investigation into the relationship between participants' claimed ages and educational levels. The association between participants' claimed ages and their stated educational levels did not reveal any unexpected findings.

This survey provided a fair collection of thoughts and attitudes on relocation management techniques and procedures from defendants from a range of backgrounds in the DACH area. This was made possible by the wide-ranging diversity of participant profiles.

8.3. Participants Perception of Key Study Constructs

The analysis of the participants' data gives further information on the study's elements and outcomes while focusing on key elements of the business environment in which it was performed. The theory of planned behaviour (TPB) served as the theoretical background and provided links to the latent variables and the associated measurement objects for assessing the key constructs founded in the conceptual model. This was done in light of the literature review for relocation management and the current information systems that focus on and use these models. As a result, the pilot study evaluation (Chapter 6) served as a platform for determining the psychometric properties of the model. Further evidence of the existence of latent variables addressing the hypothetical model was provided by the SEM and data analysis technique used to explore the main outcomes (Chapter 7). This section focuses on going into further detail about how the participants saw relocation management and how they felt about the major concepts.

The association between the participant's position within the organisation and the median values of the construct Attitude of management support (AMS), shown in Figure 30 in Annex III, was evaluated. Here, a trend curve reveals that middle management and management level positioned themselves in such a way that a higher degree of management support would benefit the intended outcome. This is consistent with research showing that managers with high emotional intelligence foster good work attitudes inside their organisations (Carmeli, 2003; Jiang et al., 2018).

Figure 37 in Annex III shows the results of an evaluation of the association between participant age and the mean values of the construct "attitude of management support" (AMS). Although the distribution to this group was only 2.3%, the participants' mean age was much greater. For the construct "Attitude of management support," no significant differences or trends were found to be related to the participant's position in the organisation (AMS).

Figure 31 in Annex III shows the results of an evaluation for the association between participant position within the organisation and the mean values of the construct "Attitude of level of understanding for relocation management" (ALOUR). Regarding the construct Attitude of level of understanding for relocation management, no noteworthy trends or variances were found to be related to a participant's position within the organisation (ALOUR). Figure 38 in Annex III shows the results of an evaluation of the association between participant age and the mean values of the construct "Attitude of level of understanding for relocation management" (ALOUR). Although the distribution to this group was only 2.3%, the mean value of respondents under 30 years old was significantly higher.

A comparison of the participants' position within the organisation and the mean values of the construct Attitude of perceived development of core competencies (APDCC), shown in Figure 32 in Annex III, was made. Regarding the concept Attitude of perceived growth of core competencies, no noteworthy trends or variances were found to be related to the participant's position within the organisation (APDCC).

A comparison of the mean values of the construct Attitude of perceived development of core competencies (APDCC) and the participants' ages was made, as shown in Figure 39 in Annex III. The distribution to this group was only 2.3%, despite the fact that the participants' median age was significantly higher. For the construct Attitude of perceived development of core competencies, no significant differences or trends were found to be related to the participant's position in the organisation (APDCC).

The association between a participant's position within an organisation and the mean values of the construct "Attitude of the motivation for localization driver" (ALD), shown in Figure 33 in Annex III, was evaluated. Regarding the construct Attitude of the motivation for localization driver, no noteworthy trends or variances were found to be related to the participants' position within the firm (ALD). A comparison of the mean values of the construct Attitude of the motivation for localization driver (ALD) and the participants' ages was made, as shown in Figure 40 in Annex III. The distribution to this group was only 2.3%, and although the mean value of respondents under 30 years old is significantly higher, no trends or significant differences were found to be related to participants' positions in the company for the construct Attitude of the motivation for localization driver (ALD).

The significant and non-significant connection pathways are outlined and explained in the next section.

8.4. Significant and Non-significant Relationship Paths

The assumptions from Section 4.7 are reintroduced in this chapter, which also explores the significant and non-significant association routes that were constructed in the final model (see Chapter 4). This explains the potential interpretations of the results and lists the hypotheses together with their values and results (supported or not).

Hypotheses for RQ1: Which perceived attitudes and behaviours affect strategic relocation practise intentions in DACH (Germany, Austria and Switzerland) companies in a relocation process to China?

8.4.1. Attitude of management support for SCPRM (AMS)

The first research hypothesis challenged how much a person refers to happy or bad sentiments (appraising effect) and if they received enough management commitment and support, resources, training, time allotment, and encouragement to use a certain system. The results in Chapter 7 showed that sufficient management support was linked to the motivation for the intention for relocation. According to the research, management support had a favourable and substantial effect on the level of MIRM. The findings therefore suggest that receiving enough management assistance raised the user's motivation for relocation tasks by improving resources, training, and time allocation.

H1a: Managers' attitudes grounded on management support (AMS) will privilege the intention to choose external relocation operations versus internal relocation operations.

H1b: Managers' attitudes grounded on management support (AMS) will privilege the intention to choose external relocation operations versus concurrent relocation operations.

H1c: Managers' attitudes grounded on management support (AMS) will privilege the intention to choose concurrent relocation operations versus internal relocation operations.

AMS -> MIRM (-> MDRU)	external versus internal	H1a	Supported
AMS -> MIRM (-> MDRU)	external versus concurrent	H1b	Supported
AMS -> MIRM (-> MDRU)	concurrent versus internal	H1c	Not tested

For the construct: managers' attitudes based on management support (AMS), H1 was supported, showing a positive effect towards managers intention toward relocation mode choice (MIRM). H1a (external versus concurrent) shows a positive direction for MIRM. H1b has a higher intention than H1a. H1c (concurrent versus internal) is not tested.

According to Ranganathan and Balaji (2007), sound reasoning is required to successfully promote change in businesses with regard to H1a and H1b. This emphasises the significance of top management being the driving force behind relocation management and for the issue to be understood throughout the whole firm. Relocation management strategies must be embraced by the whole company, and every staff member involved must believe that their voice matters. Companies may also promote a disruption awareness culture, making relocation management a crucial component of the business (Mihalache, 2020). As per various research, it has been found that employees' perceptions of a system's viability and decision to use it are significantly influenced by the attitude of management support (AMS). Theng and Wan's (2007) study on weblogs for learning indicated that student evaluations of the effectiveness of weblogs are influenced by peer and instructor support. To further explain, Theng and Wan (2007) found that a student's opinion of the utility of weblogs for learning purposes was significantly influenced by support from individuals who were personally related to them (in this example,

the student's peers and tutors). Applying the same supposition to explain the same connection route developed for this study, the key management personnel within the company and peers of the relocation practitioners would be supportive individuals.

The arrangement of the participants for relocation activities within their organisations, of which nearly two-thirds (as stated previously in Chapter 7) had set up such a work gathering to oversee the successful working in a relocation setup, could also be used to describe the meaning of this relationship. The outcomes from this study demonstrate the significance of the assistance of management support in shaping impressions of the respect of the degree of value in utilising relocation. The claim made by Lewis et al. (2003) that if a friend, manager, or another performer in a relevant informal group (hierarchical setting) accepts that a support is valuable, the resultant impact through a choice of shared insight is that the objective individual will likewise see the support to be valuable.

Additionally, given that both hypotheses h1a and h1b, which predicted that a management supporter's attitude would have a significant positive impact on a mover's intention, were empirically supported, it is possible for management support to have an impact on how easy or difficult it is for a company to use relocation management tools. The findings of Brunner et al. (2020), which investigated the influence of top-management support of large DACH companies, frequently show that the C-Level roles were generally involved in all activities, and that they represented that dedicated operations top management roles were common practice. This is consistent with management support, since the organisational distance between managers' and subordinates' daily tasks is likely to provide significant information about the complexity of a system (in this example, relocation operations) (Lewis et al., 2003). Additionally, in small and medium sized companies relocation activities are sometimes led and taken by top management (Thill et al., 2014), since strategic roles are rare and in double function within the leadership. Massini et al. (2010) found that where a strategy acts as a guideline for decision making process, a loss of managerial support was indicated as a high risk for offshoring activities without corporate strategies.

In conclusion, the study's findings supported the contention made by Frau (2023) and Madhavaram et al. (2023) that top management support shapes a person's perceptions of the value of such supply chain (in this case, relocation) management systems.

Having the factor of concurrent relocation operation included (H1b), the attitude of management support and capability was found significant in this study compared to the study of Wu and Weng (2010) for the high-tech industry. Wu and Weng (2010) argue that success in external offshoring for an organisation hinges on management its capabilities and their support of the activity. Likewise in a Taiwan focused study, where the semiconductor industry plays an important role (Deloitte, 2016; Ross Young, 2021), their results did not support the perceived external management capability.

A key component of an organisation's success is management's capacity to recognise, foresee, and assist the emergence of potential issues. This is particularly true for SCPRM, where the effort to comprehend extraordinarily complicated situations before decision-making frequently involves a communal effort (across partners and among divisions, organisations, networks, and management and staff) as opposed to the consideration of just one individual. This is consistent with the arguments made by Dutton (1986) and Dutton et al. (1989), who argued that subjects having a significant impact suggests a high degree of interdependence. According to earlier research and analyses of the literature, creating a supportive environment and encouraging managers and employees are key factors in how practical people believe a system or technology to be.

Fishbein and Ajzen (2010) make the case that a person's opinions or ideas about an objective might be seen as indications of attitude towards the thing. Given this logic and the extension of this justification to this research, it may be seen as a reflection of the attitude of relocation practitioners towards management support. With this fresh understanding, the results of this study can now be compared directly to those of Yeung et al.'s study from 2003 because the attitude towards management support construct used in this study and the attitude construct used by Yeung et al. (2003) correspond to the same key factor that influences relocation management effectiveness.

8.4.2. Attitude of level of understanding for relocation management (ALOUR)

The second study hypothesis questioned whether or not a person feels they have a sufficient comprehension of a certain strategy connected to the motive for their intended migration. The findings of Chapter 7 demonstrated a relationship between the reason for the desire to relocate and general knowledge and awareness of SCPRM procedures, tools, and approaches. The study findings indicate that the degree of relocation management understanding had a favourable and substantial influence on the degree of MIRM. Accordingly, the findings show that a user's ability to improve ongoing relocation evaluations and mitigation methods, as well as their knowledge, decision-making, and SCPRM learning, raise their motivation for relocation activities.

H2a: Managers' attitudes grounded on level of understanding for relocation (ALOUR) will favour the desire to pick external relocation operations over internal relocation operations.

H2b: Managers' attitudes grounded on level of understanding for relocation (ALOUR) will favour the desire to pick external relocation operations over concurrent relocation operations.

H2c: Managers' attitudes grounded on level of understanding for relocation (ALOUR) will favour the desire to pick concurrent relocation operations over internal relocation operations.

ALOUR -> MIRM (-> MDRU)	external versus internal	H2a	Supported*
ALOUR -> MIRM (-> MDRU)	external versus concurrent	H2b	Supported*
ALOUR -> MIRM (-> MDRU)	concurrent versus internal	H2c	Not tested

For the component "Attitude level of understanding (ALOUR)," both H2a and H2b are supported. Without going into great depth about the complicated human decision-making methods and all the many points of view that exist in knowledge research (as this would fall outside the scope of this study), a plain viewpoint is selected for this research:

"The more well-informed judgments someone can probably make, the more one person understands about a topic issue." Understanding, analysing, and managing tasks and risks are necessary when offshoring in order to help firms accomplish their stated goals.

Possessing a reasonable level of understanding of particular conditions, processes, tools, procedures, systems, and actions enables individuals to manage supply chain and operations activities (which are frequently changing) at the lowest cost, with the highest degree of quality, and with the fewest risks possible. Regarding offshore, certain norms and procedures have been defined. These analytical techniques aid individuals who engage in offshore in using tested techniques for detecting, mapping, transferring, or managing risk. Managers may create balanced and successful relocation plans for their companies to enhance financial performance and obtain a competitive edge by recognising the diversity and interconnectedness of relocation operations (Munjal et al., 2019). Currently, knowledge management, which is expressed in the attitude and degree of understanding of particular subject matter areas, is widely recognised as a valuable managerial resource, generating value and assisting employees and groups in forging a competitive advantage for businesses. In this case, that advantage is the understanding of SCPRM.

The relationship between supply chain knowledge and attitude were expected to be positive and significant. It was on the expected line, according to the theoretical assumptions (Lambert et al., 1998), and was similar to the findings of other studies obtained in consumer behaviour of sustainable supply chain behaviour that have examined environmentally conscious recycling behaviour using the theory of planned behaviour (Kumar, 2012; Ramayah et al., 2012; Vijayan et al., 2023). Communication, instructive efforts for enhancing the knowledge and level of understanding towards issues related to purchasing behaviour in e-procurement were effective in supporting behaviours that are considered positive for the motivation of intention to use the system (Aboelmaged, 2010). The results of the current study showed that user attitude was also a crucial factor for relocation practises, in contrast to earlier studies in the field of operations management by Yeung et al. (2003), which recognised attitude as a main element that influences the efficiency of knowing tools and methods (for example, the methods applied by ISO 9001).

As a result, the findings for both hypotheses supported the expectation that having relevant knowledge can aid in understanding SCPRM practises and support the outcome of a system's intention to perform external relocation operations, as opposed to internal relocation

operations, and external relocation operations as opposed to concurrent relocation operations. Employees are currently assisted in managing and resolving more complex and frequently confusing difficulties by experience-intensive occupations and an informed workplace.

Hypotheses for RQ2: What core competences influence managers relocation intentions and how interdependent are these competences?

8.4.3. Attitude of perceived development of core competences (APDCC)

The third research hypothesis questioned how open a person is to sharing information in order to improve key competences to the organisation's collective learning, coordinate varied production abilities, and integrate numerous streams of technology. The findings in chapter 7 showed that attention to using a certain system or technology for SCPRM was connected with the motivation for the desire to relocate and that perceived growth and knowledge sharing are presumed to be a precursor to precisely affect perceived behaviour. The data shows that the degree of MIRM was positively and significantly impacted by the attitude of perceived growth of key competencies for relocation management. The findings suggest that sufficient knowledge sharing in SCPRM will increase the motivation for relocation activities either by the search for resources or capabilities that are "necessary" to gain a competitive advantage or by the need to externalise activities that are "nonessential" for the company to focus on core competencies.

H3a: Managers' attitudes grounded on perceived development of core competences (APDCC) will favour the desire to pick external relocation operations over internal relocation operations.

H3b: Managers' attitudes grounded on perceived development of core competences (APDCC) will favour the desire to pick external relocation operations over concurrent relocation operations.

H3c: Managers' attitudes grounded on perceived development of core competences (APDCC) will favour the desire to pick concurrent relocation operations over internal relocation operations.

APDCC -> MIRM (-> MDRU)	external versus internal	H3a	Supported
APDCC -> MIRM (-> MDRU)	external versus concurrent	H3b	Supported
APDCC -> MIRM (-> MDRU)	concurrent versus internal	H3c	Not tested

Based on the relation between the three APDCC_3 variables and MIRM, significance was found, but with weak correlation (correlation <0.3)

independent	dependent	Correlation	n	Lower C.I.	Upper C.I.	sig
APDCC_03_01, functional technical	MIRM	0,185	271	0,067	0,298	0,002
APDCC_03_02 interpersonal, social	MIRM	0,168	271	0,050	0,282	0,005
APDCC_03_03 management behaviour	MIRM	0,144	271	0,026	0,259	0,017

Table 65 Correlations APDCC_3 with MIRM

The findings of this study support what was discovered in the literature, which states that functional competencies are the primary topic of study and discussion (Derwik & Hellström, 2017). This competence engages directly with the existing job descriptions or functions in the company and within companies' process model, such as sourcing, manufacturing, and logistics. The actual literature covers supply chain management, sales and operations planning methods, as well as supply, manufacture, and order management (Sauber et al., 2008; Shou and Wang, 2017). Additionally, this covers understanding of procedures and technology as well as the capacity to research process data. This study's empirical results demonstrate that managers' attitudes centred on increasing market competitiveness and flexibility are more likely to embrace concurrent outsourcing operations based on the question of how to boost the supply chain's flexibility.

The binding agent of SCPRM that holds the diverse stakeholders together is the interpersonal and social competency component. While cultural and cross-functional understanding is growing and is a continuation of the prior parts, it is crucial that the manager demonstrate some communication, teamwork, and these social skills (Prajogo & Sohal, 2013; Sohal, 2013). Management of current relationships, including aspects like value-adding elements (Tokman et al., 2011), conflict management (Rosenzweig & Roth, 2007) and sharing of knowledge (Halley et al., 2006). Unsurprisingly, the literature includes a variety of partnerships, including after-sales and service ties (Barclay, 2005) and production and purchasing with vendor development (Feldmann & Olhager, 2013) as well as direct partnerships between buyers and sellers (Chiadamrong & Suppakitjarak, 2008; Kern et al., 2011).

The core component of SCM is management skill, and supply chains' future depends on these competencies. This includes competences for general management agendas like strategic management, finance (budget, resources and cost), change management and the further strategy of the SCM in the company. Furthermore, a mature, innovative and inspired culture within all stakeholders. The actual literature investigates execution ability, such as decision-making, setting targets, creating and implementing long-term strategies (Sohal, 2013; Vilela et al., 2018). The literature on SCPRM strategy discusses how to be competent in SCRM and how to

know what to do (Ellinger & Ellinger, 2014), sourcing without disclosing competence (Drejer & Sørensen, 2002; Parry et al., 2010) and the alignment of processes and synergy creation. Social control is less crucial than attitudes and competencies as judges of behaviour or perceived behaviour, whereas managers' attitudes that are focused on increase functional and technical competence are more likely to foster managerial competence in business intelligence, business strategy, resource management (Sangari & Razmi, 2015; Tokman et al., 2011), which can be explained by the number of C-level participants in this study.

Supply chain management is relational and collaborative at heart. As highlighted in the paper of Thomas (2014), SC practises are influenced by human interactions, and the boundary-spanning nature of the discipline makes it more difficult to comprehend and control human behaviour. Organisational, cultural, and international borders are all crossed via supply networks. Supply chain managers engage in a range of trading connections with a large number of people. Supply chain managers require support from hundreds of individuals in various functional areas and different businesses to achieve an ideal operational solution, which is in line with the findings of Cheon et al. (2012), where a positive attitude shows significance. In addition to the function competence demonstrated in the other two clusters of core competence, achieving this goal is quite challenging and calls for a variety of highly developed soft skills (i.e. relationship management, leadership, collaboration, creativity, negotiation, and selling).

The outcome shows that senior managers aim to pursue concurrent relocation as a new strategy when organisations fail to target vital capabilities overseas in external relocation as a backshift in respect to a concurrent approach for internal search happens. Likewise, when a distinct approach is used, such as to lessen the danger of reliance, which is a projecting element, internal capabilities and competencies are strengthened (Nujen & Halse, 2017).

Some findings in the study have also underscored the significance of developing core competences at the organisation's headquarters, which supports the assertion of Nujen and Halse (2017) that: "sourcing decisions tend to disregard in-house knowledge aspects. ... Moreover, the extant research within global sourcing often has an external focus when discussing knowledge, and to a less degree been addressing the risks associated with the loss of internal competence, knowledge base and innovation ability" (pp. 262-263).

8.4.4. Attitude of motivation for localisation driver (ALD):

The fourth study hypothesis questioned the extent to how much a person refers to positive or negative sentiments that are key motivations behind managers' choices to outsource work and are connected with the motivation to move. The results in chapter 7 showed that the main driver for relocation, in particular cost savings, market competitiveness factors, resource seeking motivations and industry practices, were linked with the motivation for the intention to relocate. According to the investigation, the degree of MIRM was positively and significantly impacted by the motivation for localisation driver for relocation management attitude. Consequently, the

results indicate that users' perceived benefits to gain competitive advantage by SCPRM increase the motivation for relocation activities.

H4a: Managers' attitudes grounded on understanding of the localisation driver (ALD) will favour the desire to pick external relocation operations over internal relocation operations.

H4b: Managers' attitudes grounded on understanding of the localisation driver (ALD) will favour the desire to pick external relocation operations over concurrent relocation operations.

H4c: Managers' attitudes grounded on understanding of the localisation driver (ALD) will favour the desire to pick concurrent relocation operations over internal relocation operations.

ALD -> MIRM (-> MDRU)	external versus internal	H4a	Supported
ALD -> MIRM (-> MDRU)	external versus concurrent	H4b	Supported
ALD -> MIRM (-> MDRU)	concurrent versus internal	H4c	Not tested

Survey studies (Di Mauro et al., 2018; Golinska & Romano, 2012; Johansson et al., 2019; Kinkel, 2012; Kinkel & Maloca, 2009; Stentoft et al., 2016; Upadhyay et al., 2023; Zhang & Gallagher, 2016). For example, Kinkel and Maloca (2009) and Kinkel (2012) listed six factors of offshoring decisions (labour costs, market opening, capacity constraints, vicinity to customers, taxes and subsidies, and knowledge pools) and five of relocation (flexibility, quality, integration costs, infrastructure and availability of qualified personnel).

The findings demonstrate unequivocally that managers seeking a superior cost base should adopt any offshore operations model rather than none or backshoring (see Table 36). The study of Pla-Barber et al. (2019), which focuses on external operation mode, found that in fact the manager attitude for having everything outsourced at supplier site is mainly focused on cost cutting. When a company lacks the resources or skills necessary to strengthen competitiveness or when it has to concentrate its efforts on core competencies, managers choose concurrent offshore operations over external outsourcing. Exactly as predicted, managers participating in relocation operations were motivated to adopt concurrent outsourcing operations by previously devised strategic initiatives by rivals. Being close to the client benefits logistical costs, lead times, and flexibility, all of which have an impact on a company's financial and non-financial performance measurements. The results also showed that both concurrent and external outsourcing had financial benefits due to cost reasons.

There were similar findings from Pedroletti and Ciabuschi (2023) and Mudambi (2008), where cost savings were not considered in a silo as a single factor to judge in deciding where production should be established. Getting away from low-cost country sourcing, once markets build up and grow, the focal point of production location on the delivery of further perceived value to buyers located in these regions is a large driver of relocation location decision. The

results of this study support that more strategic factors should be included than just the cost saving approach.

Given that all localisation drivers can positively affect relocation management activities, a manufacturing/production relocation can lead to enhancements in all performance fields. Applying only one perception (low-cost sourcing, or development capabilities) as the basis for SCPRM may lead to advancements in the related proposed focus field, but not to overall enhancements on a larger scale. As an alternative, it is necessary to have all perspectives of the drivers included to achieve stronger-scale enhancements in flexibility, quality, integration costs, infrastructure and availability of qualified personnel execution. The larger the amounts of drivers taken into account, the stronger the capability for improvements will be. Hence, companies do not commonly carry out one-factor approaches. Instead, they actively seek to balance all major factors in their business relocation assessments (Johansson & Olhager, 2018).

Remarkably, cost benefits would be enjoyed if relocation activities were driven by market-proximity factors, thus emphasising the value of the market bundle for relocation. If relocation activities were driven by trade policy or regulatory influence factors, then no further cost savings would be expected.

Hypotheses for RQ3: What factors influence the decision of operation modes between family managed, family owned and public companies in the beginning of a localisation process? What tested relationship paths exist?

8.4.5. Social pressure (SP):

The fifth research hypothesis challenged the use of type of ownership (family businesses versus non-family businesses) as a proxy for the subjective norm behind managers' offshoring decisions linked with the motivation for the intention to relocate. The results in Chapter 7 showed that social pressure was not linked to the motivation for the intention for relocation. According to the investigation, it cannot be concluded that the degree of MIRM was significantly and positively impacted by the kind of ownership as a localisation driver for relocation management. Consequently, the results indicate that perceived social pressure from the market is not significant in increasing the motivation for relocation activities nor does it have an impact.

As a representation of the subjective norm, the type of ownership (family owned versus family managed versus public firms) will be used.

H5a: Social pressure (SP) will favour the desire to pick external relocation operations over internal relocation operations.

H5b: Social pressure (SP) will favour the desire to pick external relocation operations over concurrent relocation operations.

H5c: Social pressure (SP) will favour the desire to pick concurrent relocation operations over internal relocation operations.

SP -> MIRM (-> MDRU) external versus internal	H5a	Not supported
SP -> MIRM (-> MDRU) external versus concurrent	H5b	Not supported
SP -> MIRM (-> MDRU) concurrent versus internal	H5c	Not tested

Corresponding to the research model, family versus non-family firms is used as a proxy for subjective norm. Family businesses are more likely to experience social pressure against offshore. Subjective norms (in TPB) are created by normative beliefs and motivation to conform (with significant others) and for managers, the important others whose opinions were important to them were their peers (friends) and other co-workers.

Family-owned businesses tend to be more conservative than non-family businesses, according to the literature (Pukall & Calabro, 2014). In this study in terms of difference discovered between family owned and family managed, no significance was found in the results. Two control variables showed a non-significant relationship: company size (0.004, $p < 0.001$) and family owned (0.014, $p < 0.001$). The relative likelihood of engaging in internal relocation rather than in external relocation is higher for larger companies.

Control and flexibility also plays an important role in this instance (Quinn & Hilmer, 1994). Similar to the findings of Pongelli et al. (2019) our findings confirm that family companies are more likely to choose internal or concurrent relocation (i.e., build a strategy and organisation) than external relocation (i.e., buy strategy) in international markets.

Compared to other studies in the field, social pressure plays an important role in green technological intentions and sustainable economic initiatives (Saeed & Kersten, 2019; Singh et al., 2018). This is observed especially for the BRIC (Brazil, Russia, India and China) countries, where resources used in a company structure and their environmental behaviour affect a manager's intention as an external factor from market pressure (Yin et al., 2023). Remarkably, in the literature findings a positive influence on management behaviour is valid for individuals in waste management (Vijayan et al., 2023) as well as in the objective for companies to seek sustainability (Yin et al., 2023).

Adapting the view of the DACH region to the world, it is found that sustainability is playing a more important role in gaining certain environmental certifications (e.g. ISO 14001) (Do et al., 2022; Kauppi, 2013; Kumar & Suresh, 2008), the external drivers in terms of regulatory and market pressure observed by company management were mainly realised in market pressure, which is validated by Saeed and Kersten (2019), who made a detailed analysis of the scientific literature to identify the drivers of market pressure.

This study investigates the relocation of high tech industry manufacturing to China, especially the semiconductor industry in China, which is still highly import-dependent and relies in building eco systems around this industry, including universities to provide human capital (Kong et al., 2016). The focus is here more on building or supporting networks between companies and institutions in terms of technology upgrades rather than the impact of the perceived market pressure. In the existing literature (e.g. Liu et al., 2014), foreign competition in make or buy activities is more seen in external relocation, whereby the result of this study indicate more of a movement in the concurrent direction. This is consistent with findings by Monge et al. (1992) that workers' assessments of the influence of social pressure had no significant impact on the level of MIRM.

The usage of type of ownership (family companies versus non-family firms) was anticipated to play a significant effect in management decisions of relocation in line with our study model (Figure 16) (Musteen, 2016). Specifically, since the threat of exploitation and the possibility of losing brand and reputation are greater than in controlled offshore, managers were expected to be more reluctant to surrender control by engaging third parties (external) (Pukall & Calabro, 2014). Certainly, family SMEs are likely to have a shortage of internal resources and therefore be reluctance to take the choice to external financial and managerial capabilities, consequently pushing them to implement low-responsibility entry modes (Kontinen & Ojala, 2010). In conjunction with the growing attention of a wider audience in internationalisation, in recent years researchers have perceived a shift in attention toward large family multinational enterprises (MNEs) and business groups taking greater consideration of different entry modes beyond exports, such as greenfield and acquisitions (internal relocation) (Boellis et al., 2016) or international joint ventures (Debellis & Pinelli, 2020; Sestu & Majocchi, 2020). In this study of the high-tech industry in vacuum technology, no significance was found between the different type of ownership.

8.4.6. Factors influencing the perceived behaviour control (PBC):

The sixth research hypothesis covered factors influencing the perceived behaviour control (PBC) behind managers' offshoring decisions linked with the motivation for the intention for relocation. The results in chapter 7 showed that factors influencing perceived behaviour control were not linked with the motivation for the intention to relocate. The findings of the investigation do not demonstrate that the company's size, location, or relocation management expertise had a favourable or significant effect on the degree of MIRM. Hence, the results indicate that perceived behaviour control is not significant to increase the motivation for relocation activities nor has an impact.

H6a: PBC (size, location and experience in relocation) will favour the desire to pick external relocation operations over internal relocation operations.

H6b: PBC (size, location and experience in relocation) will favour the desire to pick external relocation operations over concurrent relocation operations.

H6c: PBC (size, location and experience in relocation) will favour the desire to pick concurrent relocation operations over internal relocation operations.

PBC -> MIRM (-> MDRU) external versus internal	H6a	Not supported
PBC -> MIRM (-> MDRU) external versus concurrent	H6b	Not supported
PBC -> MIRM (-> MDRU) concurrent versus internal	H6c	Not tested

Perceived behaviour control (PBC), which is defined in the literature review, assesses managers' perceptions of control over carrying out a certain behaviour (Rawstorne et al., 2000). It has previously been theorised to anticipate and defend both, behaviour and intention (Ajzen, 1985). According to Francis et al. (2004), one factor that influences a manager's desire to act is perceived behavioural control, or if the subject feels in charge of the situation.

The result of this study shows no significance for PBC to the managers' intentions. In the past, research in different areas of consumer behaviour confirms the result that PBC has no impact on intention, but there is an impact on the subjective norm (SP) (Fu et al., 2010; Xu et al., 2022). In the framework of the health decision making process, Yang et al. (2010) observed that subjective norms (SP) has significant effect on user intention. The achievement of new product introduction was discovered by Fu et al. (2010), whereby the PBC has no significance on the selling intention of the user. Similar to the finding of Singh et al. (1996), in this study missing support for resources, knowledge and experience in relocation activities may add counterproductive pressure and stress and doubts to the user for the intention of relocation and therefore have a negative impact on relocation activities.

Because more than 75 percent of participants worked for businesses with more than 300 workers, the impact of physical distance on relocation and the home country played a less important role than in SMEs observed by Ojala (2015). The focus was found to be on sufficient resources and available knowhow, the perceived psychic distance of the user, in seeing difference in language, education levels, industrial developments and different time zones, which were found to be non-significant in this study. Whereby at the beginning of relocation, low transportation cost have been identified as a sole factor for geographic distance (Gorecki & Conlon, 1986), the perceived psychic distance differences perceived by the user in culture, language, religion, education, and political systems, tested by Zhang et al. (2023), is non-significant and showing a similar results in this study.

As already observed by Contractor et al. (2010), large and experienced companies have easy access to internationalisation resources and knowledge. Consequently, they have an advantage in performing more demanding relocation operations, such as internal or simultaneous relocation operations.

Interestingly, when it comes to TPB, the outcome appears to be more impacted by the manager's attitude and only somewhat by experiences with the company's resources and understanding of the industry. This study supports some of the TPB findings, which Conner and Armitage (1998) adapted to different disciplines, where attitudes and skills are indicators of behaviour intentions. This is consistent with and supported by Pla-Barber et al. (2019), who found that social control had a minor impact. Social control has less of an impact on the choice to undertake outsourcing operations depending on what is anticipated to occur.

To compare the impact to the DACH region, the influence of the home country can have some impact on manager decisions. Cuervo-Cazurra et al. (2018) found that since the focus of large companies is cross-border acquisitions of companies in advanced countries, social control is not specified as a driver to enhance the intention to relocate.

The 8th research hypothesis challenged factors influencing the perceived behaviour control (PBC) behind managers' offshoring decisions linked with entrepreneurial behaviour for managers decision on relocation (MDRU). The results in Chapter 7 showed that factors influencing the perceived behaviour control were not linked with the managers' decision on relocation (MDRU).

H8: PBC (size, location and experience) is positively related to subsequent entrepreneurial relocation behaviour, over and above its mediated effect via intention.

PBC*** -> MDRU

H8 Not supported

variable	internal vs external		concurrent vs external		Sig LR	R^2	hypothesis
	B	Sig	B	Sig			
B01_kl	0.085	0.771	-0.285	0.478	0.658	0.004	H8 not family owned yes
B02_kl	0.521	0.110	0.521	0.273	0.225	0.014	H8 company size > 300 yes
C02	0.153	0.196	0.361	0.033	0.083	0.024	H8 experience

Table 66 Logit model step 1: Bivariate analysis

The result of bivariate analysis shows that for the three structural variables, “type of control”, “company size” and “experience”, a significant relationship with regard to offshore activities cannot be demonstrated (Table 60).

Compared what was expected from the existing literature review, size location and experience had no significance for the managers' behaviour. According to the study of Rennie (1993), a typical conventional internationalised corporation typically maintains a solid home basis. It has a robust product portfolio, excellent technical talents, and a well-established core business. Without a solid foundation in the domestic market, those businesses would not begin activities aimed at the global market via export. However, in order for small and medium-sized

businesses to expand internationally, they must integrate themselves into the global market from the beginning. These businesses see overseas markets as opportunities to explore and learn new things (Liu & Li, 2022).

Roza et al. (2011) proved the size of the company has no significance in internal or external offshoring. The difference is that small companies are looking for a cost driven strategy, in comparison to medium and large companies that have the resources and entrepreneurial strategy in place, as well as exploring new competences. This is consistent with this study's findings. In the study by Pennings et al. (1994), where a longitudinal approach was selected, ownership structure showed different result in combination with the year of operation in relocation operation modes. An interesting finding was that in the case of joint ventures (JV), where 50% ownership is associated, there were difficulties in lifetime expectations. The concurrent approach is going in the same direction, whereby only the mode and not the performance of years was tested and showed no significance.

These interventions serve to both illustrate and clarify the value of management participation as well as the requirement for dynamic skills to allow the organisation to adapt, develop, and transform resource-affected areas (Teece, 2007). However, this also applies to talents that are already there but have not yet been strategically positioned and organised, since capabilities are “incapable” unless secured in the company's business theory (Prahalad & Hamel, 1990).

variable	internal vs external		concurrent vs external		Sig LR	R^2	hypothesis
	B	Sig	B	Sig			
B01_kl	0.085	0.771	-0.285	0.478	0.658	0.004	H8 not family owned yes
B02_kl	0.521	0.110	0.521	0.273	0.225	0.014	H8 company size > 300 yes
C02	0.153	0.196	0.361	0.033	0.083	0.024	H8 experience
MIRM	0.353	0.007	0.525	0.007	0.003	0.054	H7

Table 67 Logit model step 1: Bivariate analysis

The result of bivariate analysis shows for the three structural variables “type of control”, “company size” and “experience”, that a significant relationship with regard to offshore activities cannot be demonstrated (Table 60).

8.4.7. Managers intention toward relocation mode choice (MDRU):

The 8th research hypothesis challenged managers intention toward offshoring decisions linked with the mode of relocation. The results in chapter 7 showed that factors influencing managers intention toward offshoring decisions were linked with the actual use of relocation mode. From the analysis, it is proven that a senior managers’ intention for relocation management had a positive and significant impact on the level of MRDU. Furthermore, in the analysis of the polytomous variable, concurrent relocation had the highest load for the intention, followed by internal relocation.

H7: Entrepreneurial intention for relocation is positively related to subsequent entrepreneurial behaviour for managers decision on relocation (MDRU)

MIRM -> MDRU

H7

Supported

	Intention
external	0,00
Internal	0,35
concurrent	0,53

variable	internal vs external		concurrent vs external		Sig LR	R ²
	B	Sig	B	Sig		
MIRM	0.353	0.007	0.525	0.007	0.003	0.054

As discovered by previous studies in the field of IS, (Davis et al., 1989, 1992) and in consumer behaviour (Acedo & Galán, 2011; Giampietri et al., 2018; Kumar, 2012), behavioural intention was significantly correlated with behaviour usage. Findings from Fishbein and Ajzen (2010) support this, indicating intentions are good predictors of behaviour.

Actual behaviour was often examined concurrently with prognosticator factors in surveys that evaluated actual behaviour (Adams et al., 1992; Al-Gahtani & King, 1999; Levine & Donitsa-Schmidt, 1998) or in cross-sectional analyses (Allgood & Walstad, 2013; Evaristo & Karahanna-Evaristo, 1993).

The results of this study clearly confirm that managers wish to keep control and wish to have concurrent or internal relocation, with a higher intention compared to external relocation. Cost cutting is an advantage, but as found in the results of the study not the main driver anymore, in contrast to the findings of Kinkel (2012). In terms of resources and gaining competence knowhow, especially in the non-core capabilities of the company, this study finds managers prefer to optimise for internal or concurrent relocation for the high-tech industry. This is a new finding in DACH relocation activities compared to other industries, e.g. simple and medium complex products, where cost leadership plays an important role (Kinkel & Maloca, 2009).

Unstable supply chains, where resilience is becoming weak due to uncertainty caused by different events, leads companies to introduce concurrent sourcing models (Mols, 2010). High demand from the market side and a shortage of raw material and semi-finished goods had an impact, when the survey of this study was conducted (Deloitte, 2020). Moreover, Browning et al. (2023) highlighted that investing in a stable supply chain and production might be in the short term more expensive, but in the long term it avoid disruptions and improves the ability to supply and generate profit for the long term goals of the company.

In line with the study of Deavers (1997), external relocation, in the “make or buy” strategic choice, allows companies to concentrate on developing core competence internally, while non-core business can be outsourced to create flexibility. The results of this study confirm the tendency to share the risk between the supplier and the customer, which is why concurrent has the highest intention, as confirmed by Pellicelli (2021). The trade-off between flexibility and control gives companies the option of releasing company resources to focus attention on the management of the core competencies. In particular, environmental changes in the market, like rapid growth or downsizing, which have affected the vacuum industry since 2019, allow companies to react fast and gain a competitive advantage, whereby the findings highlighted by Sharpe (1997) and Pellicelli (2021) can be adopted with the findings of this study.

The accuracy of measuring behaviour and intention simultaneously is uncertain and presents challenges. Psychological factors ensure a good association between the measurements when participants answer questionnaires that include indicators of intention and self-reported behaviour. A person's assessment of their usage conduct may be inferred from their perception of their purpose, and vice versa, according to the self-perception theory (Bem, 1967). Festinger (1962) claim in his theory of cognitive dissonance that this is not a correct assessment of the model's capacity to forecast behaviour for the future, but rather a test of the model's capacity to forecast behaviour in the present. The questions in this study were constructed in such a way as to solicit future behaviour in the next three to five years. Forecasting future behaviour is more difficult, according to Ajzen and Fishbein (1980), because there is a lag time between an intention and a behaviour in which unanticipated events or other factors may throw off the connection. Even though longitudinal studies are uncommon, it appears that none have been done from a primarily SCPRM mandatory standpoint, which might be a path for upcoming investigation.

This study's perspective is consistent with the TPB's belief that intention and behaviour should be assessed at many points in time to determine how strongly present-day intentions influence future behaviours. In this study, it is assumed that behaviour and intention are only weakly positively connected, and that this association may weaken as the time interval widens. Findings from this study support the idea that intentions can predict behaviour since, as a general rule, intentions and behaviour have very weak connections when people are not fully in control of their actions (Ajzen, 2005). The research also confirms the theory put forward by Ajzen and Fishbein (1977, 2005) that a person's attitudes toward an object significantly influence their subsequent behaviour.

8.5. Discussion of applying TPB for relocation activities

To contribute to an understanding of the reasons why production and supply chains have been relocated in recent years, this study intended to test an adapted framework of TPB to investigate activities of SCPRM in relocation. In particular, it analysed the role of management intentions and behaviour; in order to measure this the standard TPB variables (e.g., attitudes, subjective

norms, perceived behavioural control, intention) were adapted according to the derivation of the research questions and their respective hypotheses. The result of the study shows that TPB is a useful framework to understand the investigated behaviour and especially the intention that drives it. Compared to the other TPB frameworks, this model shows a respectable goodness-of-fit statistics. All the investigated variables for attitudes show a positive effect on intention.

There was no significant effect of PBC on intentions. However, the lack of support for the role of PBC in the likelihood of related intentions and behaviour should not automatically be explained as a failure of the model in the SCPRM context. In this study, average levels of PBC were slightly lower than attitudes (4.5 on a 7-point Likert scale), and restriction of choice may have limited the foretelling influence of this construct. Actually, the selected behaviour appears to be associated with superior degrees of unforced control, with the result that the behaviour should be affected by attitudes and momentary norms, as outlined in the earlier theory of reasoned action (Fishbein & Ajzen, 1975).

This study endeavoured to explain the role of social pressures (subjective norm) in the TPB. Some studies of the model have implied that subjective norms have a much smaller impact on intentions than attitudes do (e.g. Armitage & Conner, 2001). Nevertheless, this need of proof for subjective norms may reflect inadequate conceptualisation of subjective norms within the framework of the TPB. Therefore, the present research examined the distinction between injunctive subjective norms (e.g., the subjective norm of “should”) and descriptive subjective norms (e.g., the subjective norm of “is”). The results showed no difference in significance in both injunctive and descriptive subjective norms to predict intentions for relocation activities. There is no indication that individual managers were more likely to aim to start their relocation activities if they perceived support from other stakeholders or markets to start relocation activities existed and if important competitors were doing the same.

This study is one of the rare attempts in the field of SCPRM to utilise the TPB's components to explain some of the disparities in supply chain and manufacturing operations' relocation decisions for the high-tech sector. Despite the fact that various research has identified the multiple offshore and relocation motivations for consumer components and low-cost sourcing, few studies have studied the topic in this specific industry and destination country (China) in such a broad way, both theoretically and empirically. The findings show that management attitudes and intentions had a significant impact on decisions concerning relocation operating modalities. Particularly with regard to the TPB, it appears that the manager's attitude and to some extent the company's basic competencies in terms of resources and expertise both had an impact on their choice. The fundamental competences in this study were divided into three main areas, all of which were found significant to the manager's goal.

This study, like earlier studies, supports several TPB findings that have been applied to other domains (Conner & Armitage, 1998): Social control holds a less significant position in the

prognosticators of behaviour hierarchy than attitudes and skills. When deciding whether to carry out relocation operations or not, social control and social norms may have some bearing on expectations; however, after the choice has been made, they have less of an impact on the type of relocation mode the manager or person in charge proposed.

In this study the dependent variable is not only internal or external relocation, but also a third option, concurrent relocation. In some studies, (Mols, 2010; Parmigiani, 2007; Pla-Barber et al., 2019), this option is handled as an extension of internal relocation.

Although this research suggests, in part, that managers' attitudes can influence whether captive models (internal relocation), outsourced models (external relocation), or contemporaneous models (concurrent relocation) will be selected by SCPRM, its goal is not to offer normative advice to practitioners. Selecting the relocation operation mode is a difficult task that involves several variables. Making relocation choices may be accomplished by looking at managers' attitudes from a control-flexibility point of view, as supported by the finding by Pla-Barber et al. (2019). Managers often evaluate the main reasons for relocating first before weighing the associated cost-benefit trade-offs.

8.6. Relocation arises with the individual practitioners

The implications discussed and derived from previous section, when taken as a whole show that management, individual, and peer factors are crucial for relocation. This thread leads to the conclusion that the three axes must cooperate in order to provide the intended result and support the process of relocation in the organisation. Acceptance at all organisational levels is necessary for the relocation to be implemented (May & Abdullah, 2020). The same holds true for keeping it up. As a result, a variety of methodologies are required to fully comprehend operating systems, particularly how their social, human, and physical components interact within organisational contexts (Waters & Rinsler, 2010).

In the grand scheme of things, the human aspect, which is underlined in this study, is one of the factors that helps relocation arrangements to be kept effectively. Figure 28, which depicts the organisational context in which the relocation is applied, highlights the critical aspects that are thought to be essential, and organic, components required for efficient relocation planning. The "O" map, which resembles the letter "O," which stands for offshoring (relocation), is made up with four elements: individual, social, organisational and physical. The physical aspects would include the workspace, facilities, tools, and equipment required for the smooth running of everyday operations.

physical factors

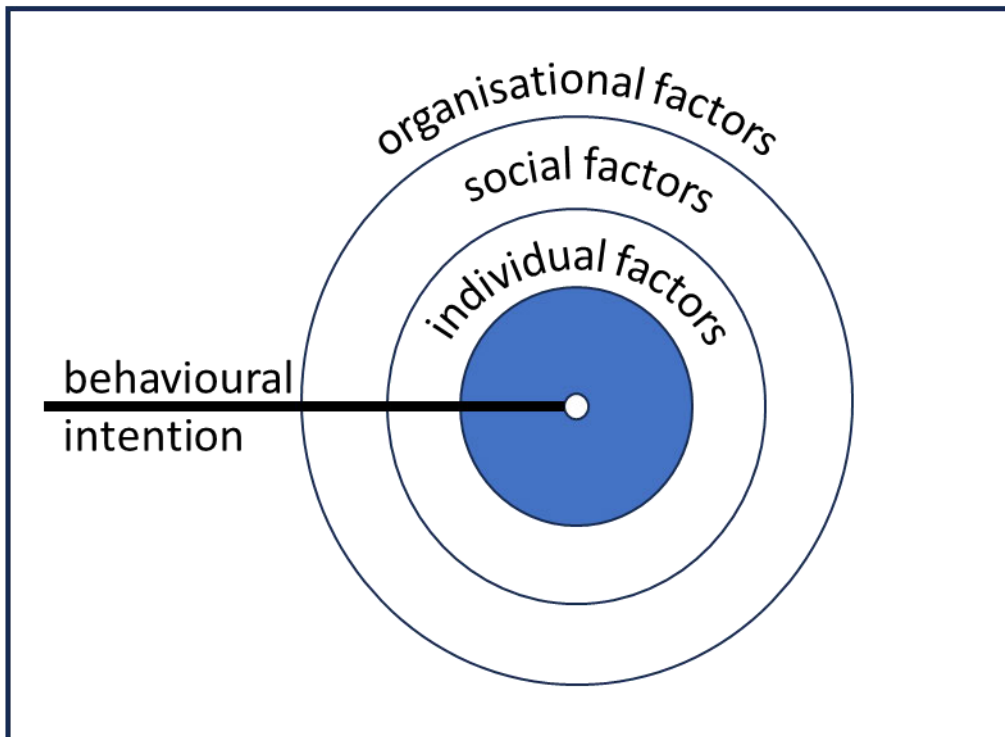


Figure 28 The "O" map
adapted from Lewis et al. (2003)

Organisational aspects include problems with the top management. Senior management dedication is viewed as the main organisational element regarding the efficient operating of relocation (May & Abdullah, 2020; Nicita et al., 2013; Pellicelli, 2021). Organisational factors have long been a topic of interest in supply chain / operations management research.

Included under organisational elements is obvious managerial support for the development of the relocation arrangements. Together, management commitment and support are crucial for establishing the signification, legitimation, and dominance structures that show people how the chosen methods and tools may be effective in their work processes and task activities. With the right management backing, the company can make sure that enough funds are set aside to support the efficient relocation activities including planning. Top management commitment and support has the impact of influencing people's perceptions of how effective the system is for work-related tasks (Stevenson, 2012).

The role of peer support is related to social components, on the other hand, Co-workers are often valuable resources for bridging knowledge gaps that prevent the effective use of complicated tasks (Dzikowska & Malik, 2022; Ranganathan & Balaji, 2007). In order to ensure that relocation processes are effectively implemented and maintained, relocation specialists are frequently required to manage a heavy load of duties at the individual level. These duties include handling non-conformities relating to products or processes, identifying corrective and

preventive actions, and monitoring and measuring supply chain performance in relation to the established relocation objectives.

Peers' support is crucial in handling difficult situations so that continued efforts to continue with relocation planning can be sustained given the size of the tasks and obligations that relocation specialists are expected to carry out. Having conversations with peers about supply chain-related issues may be empowering since it gives relocation specialists the chance to learn new things and obtain advice on how to manage problems more effectively. Peer engagement may also offer the necessary assistance and active support for the efficient upkeep of relocation activities because it is claimed that reporting of key figures and progress requires ongoing care. Therefore, it would be advantageous to have a peer support group to allow ongoing communication and education among members (Waters & Rinsler, 2010). This study has pinpointed relocation specialists' views as the fundamental factor influencing their sustained use for relocation, which in turn influences the total efforts made by their company to relocate and improve the supply chain/operations. Organisations will find themselves in an uphill battle to continue relocation efforts, if the relocation specialists do not have a strong believe in the value for offshoring. No amount of effort can make up for such a negative belief.

Despite many studies emphasising the need of a top-down strategy, where management commitment and a strong organisational culture focused on localisation drivers like cost, quality and lead time should serve as the foundation for maintaining the offshoring spirit. To put it another way, this study begins from the standpoint of the relocation. It appears that the various rooting methods lead to a chicken-and-egg problem. While an organisational culture devoted to relocation is necessary for the long-term sustainability of the supply chain and operations, it can be challenging for an organisation to effectively continue the relocation effort when relocation members do not believe in implementing offshoring activities. Therefore, it is challenging to determine whether strategy—top down or bottom up—is the best since they live in relation to one another. Without respect for one another, each approach would be lacking.

8.7. Chapter conclusion

Understanding the reasons and factors that cause managers to accept or reject the usage of a specific technology is of great interest to both practitioners and scholars (in this case, SCPRM). This type of research has been carried out to enhance the methodologies for creating, assessing, implementing, supporting, and upgrading SCPRM relocation processes by deepening understanding of the contributing elements. Based on the assessed and validated assumptions, an integrated model for SCPRM was developed in this work.

According to the thorough analysis of individual influence, offshore should be carried out using a holistic strategy that considers organisational issues, social factors, and individual variables. Given their different contributions, these three human variables, when considered collectively, aid in the accomplishment of the relocation business operations. The current research has

succeeded in bridging the knowledge gap in understanding the effect of human factors on relocation operations to China by building the relocation model, which is theoretically based and experimentally tested.

The goal of the current research was to advance understanding of the impact of human variables on SCPRM relocation operations. This goal was accomplished by developing the final model, which is theoretically supported and has undergone empirical validation. The study questions are examined, and the findings are thoroughly explained, in the closing chapter that follows. Additionally, the study's importance and limitations will be emphasised, along with potential research prospects.

9. Conclusion

9.1. Introduction

A review of the research goal from Chapter 1 is conducted at the start of this chapter. The relevance of the study's findings is highlighted and reviewed. The study's theoretical contributions and management implications are then discussed, as well as the generalisability of the study's findings. The limitations of this research are then highlighted, and suggestions for additional study and research are made. Finally, some last observations are made.

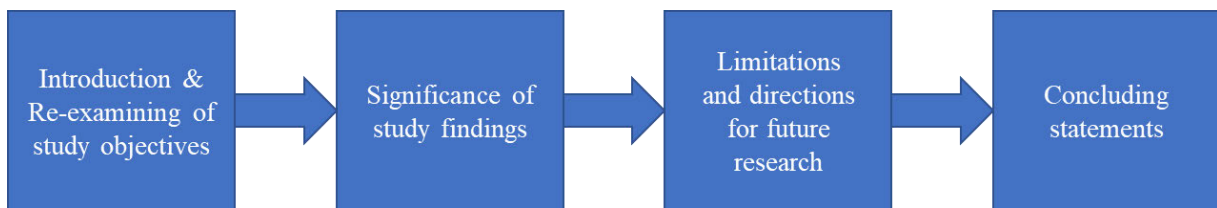


Figure 29 Schematic overview of conclusion study chapter

According to the study's objectives, the three research questions were conceived, starting with the literature review, continuing with the validation of the theoretical underpinnings, and ending with the developed and derived conceptual model. The development of the research questionnaire, its usage in a pilot study that involved data collecting, feedback from the assessors, and adjustment and refinement based on analytic results were additional topics of discussion. Using the Multinomial Logit Model (MNL) approach for the outer model and the validated structural equation modelling (SEM) method for the inner model, provided the initiative to construct the final questionnaire for the primary study. Significant variables and dimensions might be found and confirmed thanks to the structural analysis, data explanation, and construct evaluation. The structural models from the SEM and MNL procedures were used to identify and evaluate crucial direct and indirect link routes. Hypothesis testing was conducted to construct the study's final framework, which was based on the TPB model. The framework confirmed and supported the components' important paths: attitude of management support (AMS), attitude of level of understanding for relocation management (ALOUR), attitude of perceived development of core competences (APDCC), attitude of the motivation for localisation driver (ALD), social pressure (SP), perceived behaviour control (PBC), managers intention toward relocation mode choice (MIRM) and managers decision on relocation and use (MDRU). The final framework identified 7 variables and 15 dimensions as being influential in realising certain relationship routes for the inner SEM created final model.

The creation of the final model framework, which will help academics, researchers, and managers better understand and be aware of the driving forces underlying SCPRM approaches, is the major contribution of this research. By demonstrating how relationships correspond and how relocation management techniques are arranged and included, which help in understanding how they be capable of being managed, this study is judged to be able to bring value from an educational standpoint. This study makes substantial contributions to future

study as a whole, notably in the area of advancing SCPRM techniques and associated knowledge.

9.1. Reviewing the Research Objective

This section provides an evaluation of the research aims, knowledge of the study's findings, discussion of the findings from two earlier sections and the relevance of the study outcomes to the pursuit of the study goal. This research project's goal was to investigate SCPRM procedures in DACH high-tech machinery industry for manufacturing companies in relocation activities to China. Below is a discussion of the three research questions.

9.1.1. Research Question 1: Which perceived attitudes and behaviours affect strategic relocation practise intentions in DACH (Germany, Austria and Switzerland) companies in a relocation process to China?

Regulations in Germany, Austria, and Switzerland require directors of listed companies to provide data to audit committees addressing financial, operational, and regulatory threats. Beneath the system, directors are accountable for managing risk and preserving a reliable relocation risk management system. This includes, among other things, determining the nature and extent of the considerable consequences that the management board is prepared to accept in order to achieve its organisational plans through relocation activities. Directors should be in charge of designing, implementing, and overseeing project management and internal control systems, particularly for relocation. They must decide the firm's investing objectives and guidelines.

The study discovered that "operational demands such as manufacturing, quality, reducing costs, etc." and "regulation, compliance or social responsibility and ethical standards" were the primary drivers of participants' motivations for choosing to engage in relocation management activities. Even though they are significant throughout Asia, particularly in China, it is not surprising that the requirement for marketable products and the pressure from customers to produce close to the customer's site without giving away too much know-how seem to be very high up on the agenda of supply chain and production managers. The research also discovered that the most frequent activity respondents had engaged in or planned to engage in was in the area of operations and purchasing to improve their company's supply chain's resilience, after sales and service to serve the customer locally in a targeted manner, followed by sales and marketing activities, to bring about the improvement of demand forecasting. R&D and product development were at the lower level here, suggesting decisions were all about the IP protection of their own products.

9.1.2. Research Question 2: What core competences influence managers relocation intentions and how interdependent are these competences?

No matter their age, gender, educational background, or position within the organisation, all respondents gave the attitude of perceived development of core competences (APDCC) the same amount of relevance in relation to MIRM. As shown by the relationship pathways, the perceived development of core competences (APDCC) for SCPRM practitioners had a positive effect on the managers' intention toward relocation mode choice (MIRM) and further also had a positive effect on managers decision on relocation and use (MDRU), related to SCPRM practices.

This survey provides managers with some important insights. As organisations are increasingly focusing on core competencies, more companies have become reliant on adapting outsourced non-core competencies in collaboration with supply chain partners, in response to today's growing uncertainty and volatile economic environment. This allows the pooling of knowledge, know-how for developing and implementing problem solutions and is becoming more and more important to a company's competitive advantage. Managers must first recognise the dependence on other organisations' suboptimal solutions, innovations and avoidance of adaptation (Nyaga et al., 2010), then allow them to work together effectively. Not only that, managers also need to be actively involved in the collaboration and in exchanging information, as well in the search for common solutions that benefit both sides.

For the functional and technical competence, which engages directly with the existing job descriptions or functions in the company and within companies' process model, such as sourcing, manufacturing, and logistics, family-owned companies have a slightly higher focus on these competences, as well companies with a plan for internal relocation.

When it comes to interpersonal and social competence, which deals with interpersonal and social core competencies between all participants, including employees, suppliers, partners, managers, customers, and external departments, the significance is similar for all groups, aside from a lower mean with a focus on family-owned businesses and a strategy with external relocation in response to MIRM.

For management and behaviour competence, such as competences for general management agendas like strategic management, finance (budget, resources and cost), change management and the further strategy of the SCM in the company, this was slightly stronger for family-owned companies than non. Furthermore, mature an innovative and inspired culture within all stakeholders had a higher mean value for all groups than the interpersonal and social competence.

The relationship between attitude of perceived development of core competences (APDCC) and intention toward relocation mode choice (MIRM) was found in the theory of planned

behaviour model (TPB), as further developed based on the model-building approach for the managers' decision on relocation and usage (MDRU) that has been confirmed and described. Based on empirical evidence, this investigation discovered a clear correlation.

9.1.3. Research Question 3: What factors influence the decision of operation modes between family managed, family owned and public companies in the beginning of a localisation process?

The construct social pressure (SP) and perceived behaviour control (PBC) did not have a significant effect on intention toward relocation mode choice (MIRM) or on managers' decision on relocation and use (MDRU) in this study. According to the descriptive data, all groups—family managed, family owned, and public companies—experienced identical "operational needs such as production, quality, cost reduction, etc." and "pressure from consumers or markets." For the subjective norm in how much social pressure an individual received from peers to increase the intention to do, it had no significance in this study.

In view of companies in the DACH region, external localisation driver in regulatory and market pressure is observed to increase the intention for relocation, which demonstrates that the participants mainly recognized the market pressure (referring to attitude of motivation for localisation driver (ALD)). Since there was a higher intention on internal and concurrent relocation activities, social pressure is here seen for the existing literature with less or no impact on the level to influence the MIRM.

This study's findings show no significance for PBC to the managers intention. The majority of participants worked for organisations with more than 300 workers, which is consistent with the findings of previous behaviour studies in many fields. Size, location, and potential effects of physical distance on relocation and participants' experiences are all elements that may affect how in this study, the participants feel in control of the activity in issue. Whereby the focus is given on enough resources and available knowhow, the perceived psychic distance of the user, in seeing difference in language, education levels, industrial developments and different time zones was non-significant in this study. Large and experienced firms (MNL) bring the resources and knowledge with them. Therefore, social control plays a less important role in influencing the motivation for relocation activities to China.

To compare the impact to the DACH region, the influence of the home country can have some impact on manager decisions, whereby family-owned companies see the localisation driver more in the front, compared to social pressure or other follower companies in relocation activities. Since the focus of large companies is cross-border acquisitions of companies in advanced countries, social control plays less of a role in this model of research.

9.2. Significance of Study Findings

This study's goal was to obtain a better knowledge of SCPRM practitioners' attitudes, behaviours, and beliefs toward SCPRM techniques. In a number of areas, this study adds to the body of information and literature. The study began by building on the work of Ajzen (1991), which can predict a person's behaviour towards an attitude object (person, fact, idea, etc.). TPB, researched and developed by Ajzen, has been used successfully as a popular theoretical model in numerous studies to describe and predict behaviour in a number of behavioural domains, from physical activity to drug use, from recycling to choice of travel mode, from safe sex to consumer behaviour and from technology adaptation to privacy protection (Ajzen, 2020); beyond these boundaries, however, only limited TPB studies in operation/supply chain management have been conducted. TPB's relevance and usefulness in forecasting behaviour in non-consumer situations have been validated by this study's application of TPB to comprehend the perspectives of SCPRM practitioners.

Research on TPB has made significant strides since the theory was first introduced about three decades ago (Ajzen, 2011). Initial studies were mostly attempts to test the theory and to explore predictive validity in different behavioural domains. The combined weight of much empirical evidence, perhaps best captured in such meta-analytic syntheses as that contained in the current series of articles, lends clear support to the theory (Ajzen, 2020). Content that the TPB actually predicts intent and behaviour fairly well, investigators turned their attention to more challenging questions, although simple applications to new behaviours, or behaviours in novel environments, continue to appear in print. The questions raised in this study are representative of some of the questions confronting contemporary researchers. The purpose of the current study was, among other things, to better understand the function of automatic or spontaneous processes linked to habitual behaviour, which may coexist with more rational operations; Explore impulsivity and the ability to suppress it when necessary for self-regulation; to examine the usefulness of detailed plans to improve the ability to respond to intentions; to test the idea that adding anticipated affect or motive to avoid uncertainty can improve the prediction of intentions; to demonstrate individual differences in the relative weights assigned to the predictors in the TPB; and to examine the role of background factors such as personality traits. I have tried to show that some of these variables and processes, such as willingness to perform a behaviour or social support that seems to go beyond the TPB, can actually be accounted for in it, while others, such as, for example the formation of habits and various background factors, can advance our understanding of human social behaviour in the area of SCPRM in relocation.

Human behaviour is influenced by three different types of considerations, according to the TPB: beliefs about the likely outcomes of behaviour (behavioural beliefs); beliefs about what other people expect in terms of norms (normative beliefs); and beliefs about the presence of factors that may help or hinder the performance of the behaviour (beliefs of control). Normative beliefs result in felt social pressure or subjective norm; behavioural beliefs provide a favourable or unfavourable attitude toward behaviour in respective aggregates; and control beliefs result

in perceived behavioural control or self-efficacy. The current work makes a contribution to TPB through model diversification and elaboration by extending its application outside the realms of health, the environment, and consumers to a supply chain management/relocation situation.

This study adds new theoretical insights to the subject of relocation by beginning with an endogenous understanding of the behaviour of SCPRM practitioners. The identified theoretical model reflects a few crucial components, specifically:

Attitude of management support for SCPRM (AMS): the extent to which a person expresses happy or negative emotions (appraising effect) while discussing whether they have received enough managerial assistance, resources, training, time allotment, and encouragement to use a certain system.

Attitude of level of understanding for relocation management (ALOUR): the extent to which a person feels they have a sufficient grasp of employing a certain technique.

Attitude of perceived development of core competences (APDCC): the degree to which an individual is open in knowledge sharing to enhance core competencies to the firm's collective learning, connect various production skills, and integrate many technology streams.

Attitude of the motivation for localisation driver (ALD): the extent to which a person expresses either good or negative emotions (evaluative effect) that identified intentions are leading drivers behind managers' offshoring decisions.

Social pressure (SP): The form of ownership (family owned versus family managed versus public enterprises) utilised as a representation for the subjective norm.

Perceived behaviour control (PBC): In order to reflect capabilities (perceived behaviour control), the following company characteristics should be used: organisation size, global experience, and type of relocation operation.

Managers intention toward relocation mode choice (MIRM): The degree to which a manager chooses control above flexibility, which is directly tied to the relationship between costs and benefits decreasing as a result of relocation activities.

Managers decision on relocation and use (MDRU): the degree to which a managers' decision is for “internal relocation operation”, “external relocation operation” or “concurrent relocation operation” and their use in the company.

The verified theoretical model that was produced adds to the field of SCPRM's currently small collection of models with strong academic foundations. This study focused on the beliefs, intentions, and behaviours of SCPRM professionals in addition to validating the significance of the following constructs: Attitude of level of Understanding (ALOU) of SCPRM influences; Attitude of Management Support (AMS); Attitude of perceived development of core competences (APDCC); and Attitude of the motivation for localization drivers (ALD). The direct connection between the above constructs and the manager's intention toward relocation mode choice (MIRM) has also been demonstrated. The construct Attitude of management support (AMS) proved to be a very strong factor in managers' intention toward relocation mode choice (MIRM) of relocation procedures. Once this is understood, it may not come as much of a surprise; yet findings from studies on relocation and other SCPRM-related topics have not always made this point extremely evident.

Therefore, this study's initial move toward a more comprehensive knowledge of human components as part of an understanding of how SCPRM functions are another addition to the field of SCPRM. Having a greater knowledge of the behavioural and cognitive dynamics that produce systems and processes and their influence on the organisation of suitable management tools and practises for SCPRM is unquestionably a top priority for this field. This research assists in identifying prospective future research areas and in developing strategies for improving SCPRM.

9.2.1. Generalization of the Study Findings

With this study, the issue of generalisability is raised. There are concerns regarding whether the research findings are similarly applicable in other nearby high-tech industries, given that the survey was conducted as a cross-sectional, online self-reported study in the DACH region in the vacuum industry. Therefore, it is appropriate to discuss any potential issues with the generalisability of the findings here. Further explanation of the study's shortcomings and potential research directions are highlighted in Section 9.3.

Although SCPRM is not a site- or nation-specific activity, it does apply in a variety of ways and to varying degrees in manufacturing, production, and purchasing organisations all over the world (research shows that other sectors and industries are also using SCPRM worldwide). The procedures and techniques of SCPRM assist businesses of all sizes in operating successfully. Aside from the unique judgments and particular requirements of the business, this procedure does not vary considerably from one firm to another. This is so because businesses, whether they are located in China, Asia, Europe, America, or anywhere else in the globe, adhere to

global standards. This may be the case, with the caveat that practitioners may have some amount of self-awareness to draw from in areas that have previously suffered events or are more likely to be unstable. Relocation happens everywhere; thus it is assumed that the experiences described in this study are not specific to China or the DACH region. Additionally, supply chains nowadays are frequently created such that they function not just in a single nation but also regionally or internationally. This is frequently the case for businesses in the DACH area, due to the local concentration of high-tech firms and the accessibility of supplier and development partners for external relocation.

China has developed over the past two decades into a significant economic force and a viable option for expanding production in a variety of industries. Additionally, it offers research environments that bridge the R&D-close development gap between academia and industry. Engineering, manufacturing, and advanced manufacturing technologies are a few of these, as are developments in the battery and renewable energy industries.

Manufacturing is a major driver of China's economy, accounting for around 27% of China's gross domestic product (GDP) (Economics, 2022). For many sectors, including those that deal with complicated equipment, vacuum technology, additive manufacturing and clean room devices, the engineering and manufacturing sector is a critical enabler (Huimin et al., 2018). Those companies are involved with complex devices, display technology, solar and semiconductor equipment, and the manufacture of wafers. China accounts for about 90% of the world production of solar modules, 60% of the world production of displays and about 30% of the packaging and assembly of the chips utilised in the semiconductor industry. Nine of the top vacuum equipment businesses have made sizable purchases from Chinese vendors as a result of the country's enhanced precision engineering capabilities. The nation is working to make its national regulatory system stronger to safeguard intellectual property rights. According to Schwab and Zahidi (2020) and the Global Competitiveness Report (2020), China is now recognised as one of the best regions in Asia in growing skill sets of graduates from school and university. It has made a name for itself as the top destination in the area for the manufacture of television screens and renewable energy sources in the solar industry. There are thousands of businesses in the manufacturing industry, from small and medium-sized businesses (SMEs) to significant global firms (MNEs).

The data presented in this section shows that, thanks to their similar business environment models, the DACH and China's business circumstances are comparable to those of other established and emerging economies. SCPRM procedures are not often site- or country-specific activities. There are, however, a lot of site-specific factors that must be taken into account. The political and governmental climate, country-specific economic stability, level of industrialisation, environmental threats, connectedness, and accessibility of knowledgeable individuals and subject-matter experts are all factors that affect human behaviour in addition to site-specific effects. Based on the findings of this study, which are typical at the national level, it is acceptable to predict they may be applied broadly at the international level in other developed and emerging countries.

9.2.2. Theoretical Contributions

This study adds to the body of knowledge in a number of ways. It is one of the first to analyse the beliefs, attitudes, and behaviours of SCPRM practitioners about the relocation of high-tech manufacturing. This research is based first on Ajzen's (1991) work on the significance of user beliefs as crucial components of system adoption. Although several research projects in IS and allied domains have used the TPB developed by Ajzen as a theoretical model, none of them go very far beyond these confines. TPB's relevance and application in forecasting system utilisation in a non-IS and non-consumer context has been validated by this research's attempt to apply TPB to comprehend the perspectives of SCPRM practitioners.

Momani and Jamous (2017) traced the development of TPB from the beginning and explained it from its introduction 1985, derived from persuasion models of psychologies in the 1950's (Ajzen, 1985), through to validation and expansion. Through model diversification outside of IS's purview and by using the theory in a non-IS context, the current work contributes to TPB in a new evolution stage outside IS for technology acceptance theories. Corresponding with Alturas (2021), many earlier research that employed TPB and the TRA only concentrated on the factors that determine intentions to use an information system and as a result were unable to verify their models in terms of the prediction of actual behaviour for the future. Similar to this, behavioural intention is frequently employed as the dependent variable in research, although seldom is the model split in two parts, which allows behavioural intention to be utilised in the inner model together with the actual use (MDRU) in the outer model. This research was able to evaluate both aspects simultaneously, the factors that determine intentions as well as the factor that influence the behaviour of interest in the next three to five years.

Relocating supply chains and production, according to Haleem et al. (2018) and May and Abdullah (2020), presents three significant difficulties that are best summed up by the words "complexity," "ambiguity" and "uncertainty". All of these three difficulties are related to the level and calibre of the knowledge that is contemporaneously accessible regarding the possibilities and risks, not to the inherent qualities of the hazards or risks of relocation itself. The fact that people are the ones who evaluate, quantify, and manage opportunity, risk, and opportunities must also be acknowledged. The circumstances and environments in which these people function and are exposed to, including societal, cultural, and other physiological components, have an impact on them in turn.

The construction and validation of this study's developed model has amply demonstrated that attitude of management support for SCPRM (AMS), attitude of level of understanding for relocation management (ALOUR), attitude of perceived development of core competences (APDCC) and attitude of the motivation for localisation driver (ALD) are an important part of managers' intention toward relocation mode choice (MIRM) of a system and then managers' decision on relocation and use (MDRU). In addition, this study made visible that social pressure (SP) has no relevance for the managers' intention of SCPRM procedures. The existing

model serves as a foundation for a framework and offers direction for the creation of a thorough theoretical evaluation to create and put into practise management strategies for SCPRM practices. The choice of respondents in the research demonstrates how relocation choices are formed. The total relocation process includes interactive information exchange and discussion regarding possibilities and relocation management techniques. The addition of knowledge-based components and a growth in understanding are two factors that are particularly significant. As exposed by the growing attention in the area and further investigation of SCPRM, understanding relocation itself is important for decision-making, but so are management ideology, relocation assessment, and relocation or offshoring management (Haleem et al., 2018; Johansson & Olhager, 2018; Mudambi & Venzin, 2010).

This study contributes further important theoretical advances to the supply chain/operations management field of relocation by using an endogenous perspective of the behaviours of relocation practitioners. First, this study contributes to the body of knowledge on relocation (offshoring) management by focusing on the early stages of relocation operations, which have previously gained little attention. Second, the current research created for high technology equipment and components a relocation model that is theoretically supported and served as a framework to ascertain the influence of relocation practitioners' behaviour (in terms of usage of methods and tools) from outside influences or personal beliefs. To further clarify, this study investigates how endogenous psychological variables, such as perceived attitude and behavioural intentions, could foresee and account for relocation practitioners' behaviour when they initially begin relocation activities.

This thesis also suggests that the actions of relocation practitioners may be influenced by outside factors, such as those of their significant others (e.g. management support). This understanding expands beyond the realm of conventional wisdom, where a top-down approach to supply chain / operations management has frequently been the focus found in prior research, by recognising how such internal beliefs and external influence can collectively shape relocation practitioners' behaviour to maintain offshoring. The important "ingredients" (in terms of human variables) that are seen as crucial for beginning with relocation have been discovered by this study as a theoretical model. In order to do this, the study's final theoretical model expands the present pool of theoretically grounded models in the supply chain/operations management field of relocation.

This study has highlighted the significance of perceived management support as a source of influence towards offshore in addition to concentrating on the internal beliefs, intention, and behaviour of relocation practitioners. As a result, it is considered that the third contribution of this study in the area of supply chain and operations management has taken the first step towards understanding the human components as part of the comprehensive approach to appreciate how offshore works.

Further, this study's theoretical contributions also touch on TPB modelling and diversification strategies. Since its inception, TPB has more or less maintained its original form over the years.

Many TPB replication studies have been performed to show that the results are consistent. TPB has also been compared to TRA and TAM based on its origins, and it has been found to have advantages over both models (TPB incorporates behavioural control as an additional determinant of intentions and behaviour in contrast to the TRA), while making compromises by increasing complexity when compared to the TAM (e.g. adding more constructs for the actual usage). The attempts to construct larger versions of TPB studies in order to advance a better/broader knowledge of the causal linkages between elements in the chosen research area may be summed up as the model development/diversification activities for this study. The model diversification strategy is based on the idea that by introducing and applying a well-researched TPB model to other contexts (fields of research), systems, activities, and themes, it will be possible to assess its limits more thoroughly than with incremental adjustments.

9.2.3. Methodological Implications

The current research also presents other methodological implications through the way it was performed and organised. Firstly, it was conducted by adopting a combination of SEM for the inner model to unlock managers' intention towards relocation (MIRM) and the intricate relationship on managers' decision on relocation and use (MDRU) by considering differences across more than two relocation operation modes. SEM is a combination of confirmatory and path analysis, which is able to examine relationship between different observed and latent factors. Multinomial logistic regression is an expansion of binary logistic regression that allows for more than two categories of the dependent or outcome variable.

The findings of the SEM-MNL integration model show that selecting the relocation mode of operation is a challenging procedure involving several variables. Making the option to use offshore models is made more difficult by the unique characteristics of each outsourcing mode of operation. According to this study, such choices may be made by examining management attitudes from the standpoint of the SEM model of control flexibility. Managers can evaluate the related cost-benefit trade-offs after first examining the primary justifications for offshore. A company would need to consider fewer factors when choosing which outsourcing mode of operation to apply if this justification were integrated into the framework utilised in this study.

Second, this research also shows a varied population sample, (i.e., through quantitative research methodology), and included all companies related to the high-tech vacuum industry in the DACH region, from small family companies (SME) to large multinational companies (MNL). The "proportional stratified sampling approach" was utilised in this study since the overall population and each subgroup are known. In other words, this study considered the whole population rather than selecting a specific sample of single companies. This generated more reliable results and accomplished the global objectives of this research, while also leading to more generalised conclusions.

This is a novel approach to the relocation/offshoring model based on the theory of planned behaviour (TPB), in which a polytomous variable as a dependent variable was tested in the area

of supply chain/operations studies, and a significant study using SEM and multivariate logistic regression in the relocation of high technology capital equipment.

9.2.4. Managerial Implications

Today, there is a growing anxiety about the effects of globalisation on contemporary society. The difficult process of moving manufacturing is made all the more difficult by geopolitical developments, supply chain complexity, global networking, and the interdependence of the individuals engaged.

The conceptual framework that has been built makes a variety of contributions to managerial practice. It implies that situational awareness must be recognised by businesses and regularly improved so that specialists have substantial and comprehensive experience to carry out their responsibilities successfully. It is crucial to offer important information, rely on prior knowledge, and use the proper systems, technologies, tools, and approaches to aid practitioners in making decisions. This helps the individual make wise decisions and the organisation lead them in the direction of predetermined objectives and directives. Organisations should encourage contact between supply chain actors and supply chain transparency throughout the whole supply chain. A crucial component of this effort is providing the required motivation, frequent evaluation, and managerial direction.

This study shows that even though the immediate benefits of such relocation-related initiatives are not always clear beforehand, it is still important to maintain strong management backing. The communication and ongoing learning process around shifting management techniques is represented by the involvement and continual participation of major stakeholders in the process of recognising, assessing, responding, controlling, and monitoring organisations. Businesses have employed these practises in the difficult areas of operations and supply chain management for some time.

Routine-based solutions that depend on conventional decision-making tools, best practises, trial-and-error, and lessons learnt through time may be used to solve and manage less complicated situations. It is useful to separate methods for dealing with various sources from those directed at the absorption system when dealing with extremely complicated and highly unpredictable issues. As a result, information-based and resilience-focused tactics are recommended for dealing with complex resistances, while precautionary- and resilience-focused approaches are preferable for handling uncertain undertakings.

Despite their potential relevance as a business risk, prospective outcomes with extremely low probabilities frequently seem to be disregarded. In practice, when a low probability is associated with a high impact, ignoring such specifics can potentially leave the organisation surprised and unprepared. Certainly, not all possible occurrences can be taken into account.

For companies, however, identifying, planning for, and being mindful of them is an essential starting point in being ready for relocation efforts.

9.3. Limitations and Directions for Future Research

This study significantly advances the field of relocation management, both theoretically and empirically (SCPRM). There are unavoidable restrictions in performing any empirical investigation, notwithstanding the theoretical contributions and management implications that result from this study. This section lists the discovered limitations while also offering recommendations for additional research activities. Because the study focus is cross-sectional, the inferred causal order of routes in the final conceptual framework has certain limitations. Stronger conclusions on the causal sequence of model constructs might be drawn from longitudinal research. Additionally, as with any cross-sectional study methodology, it only recorded an overview of a changing and fundamentally dynamic process of outsourcing activities in relocation management (SCPRM).

Potential further research would explore the influence on system utilisation in forced and voluntary contexts, which would add new information on how people use technology and tools for relocation. Future studies might also examine if resettlement procedures alter whether a system is used on an obligatory vs voluntary basis.

This study was carried out in the DACH area, future studies may incorporate the geographic extrapolation from a developed European area to other places (such as Silicon Valley or Southeast Asia), in order to concentrate on the possible influence of variations in other industrialised or less industrialised areas. This would possibly involve analysing differences, opinions, and responses from various ethnic groups, population groups, and geographic regions as well as the effects of sensitivities to broader issues like environmental toxins, lifestyle choices, stress levels, and other influences that affect relocation practices. In its examination of the literature, this study looked at the many regulatory contexts in which relocation (SCPRM) functions. Future surveys might analyse the influence on outsourcing practices or the impact on decision-making styles of various socio-political or regulatory businesses or cultures.

As part of the relocation framework in this study, the focus was on management behaviour in the beginning of a relocation process, therefore this study employed the behavioural intention variable rather than the implementation intention variable, which would be the objective after implementation. Implementation intentions are more effective in influencing how a planned conduct is carried out, claim Ajzen et al. (2009). In comparison to the intention to do the assignment on a monthly, weekly, or daily basis, it is thought that an implementation intention such as the intention to complete a given task on a specific day of a certain month and at a specified location is considerably more precise in terms of time and context. Although implementation intention is thought to be more beneficial in this respect, it was left out of this

study since one of its underlying tenets is to create a relocation model based on theoretical foundations with an eye on developing it in the coming three to five years. It was decided to exclude the implementation intention variable because it was not derived from the TPB, which was the reference model for this study. Therefore, it is advised that future study consider the implementation intention variable. The relevance of disparities discovered in several research, when respondents failed to carry out their intentions to execute the real activity, is highlighted and documented by Ajzen (2011). Instead, since they foster commitment to the planned conduct, implementation intentions may be more successful (Ajzen, 2020).

Over time, relocation and offshore techniques develop into sophisticated and strong instruments for addressing possible damage from unpredictable occurrences or human behaviour (Contractor et al., 2010). The shifting of production and its worldwide application in addressing and managing risk, however, do not even come close to representing this degree of professionalism and strength. The multi-stakeholder management review communities must confront new difficulties that are appearing in the area of geopolitical events at the same time.

9.4. Concluding Remarks

The foundation and validation of the model developed in this study were based on a thorough review of the literature, significant contributions from supply chain and relocation experts, broad support from the academic community, the application of rigid, logical, and systematic stages and methodologies, as well as the immensely significant contributions made by independent assessors and faculty members.

The major goal of this study is to provide commercial organisations with a strategy for managing relocation activities in order to reduce hazards, increase opportunities, and better achieve goals for relocation efforts. However, relocation management and other broad activities contained in supply chain and operations management are not going to eradicate all hazards and permit a guarantee of success (Golinska & Romano, 2012; Mudambi & Venzin, 2010; Upadhyay et al., 2023).

Multiple partners are often involved in supply chains, and services and sourcing are handled globally across numerous enterprises. It comes as no surprise that supply chain risk is frequently one of the most pressing issues. The intricate network of sub-suppliers involved in delivering components, sub-components, and services might appear daunting in many sectors, such as mechanical engineering, for instance. According to Haleem et al. (2018), offshore decisions are driven by access to low-cost inputs and markets, expertise, and technology. However, uncertainty in the business environment might materialise in the form of unforeseen repercussions, such as higher prices, quality and lead-time concerns, and loss of intellectual capital. These effects subsequently weaken the success of relocations. It is crucial to keep in mind that the supply chain as a whole is being impacted by the ever-expanding list of regulatory

compliance standards, and even the most seasoned managers in charge of relocation may find it difficult to keep up with these developments.

A non-critical operations supply chain failure can have a substantial effect on a company's brand and image, as well as its financial performance in the form of fines. Many businesses use professionals (third-party providers) to carry out crucial strategic functions to avoid this. In order to achieve the next level of quality delivery, processing effectiveness, and cost savings, these sourcing and outsourcing operations usually become increasingly extensive and complex.

Operations and supply chains are becoming more susceptible to numerous disturbances resulting from globalisation. At the strategic, tactical, and operational levels, effective management is crucial to preventing the development of minor and significant disruptions. Understanding which consequences and opportunities have the highest likelihood, as well as the danger of low-probability occurrences that have substantial impact or financial repercussions, is crucial when implementing an effective relocation strategy. As a result, it is crucial to continuously examine SCPRM to make sure that policies and procedures match current circumstances and to find potential improvements in how to handle them.

Moreover, for SCPRM to be effective, employees must be given the responsibility, tools, and power of decision-making they need to address problems in a timely manner and get the knowledge necessary to make the best use of those tools. Moreover: Any shift effort must be incorporated into tactical and ongoing supply chain activities in order to be successful. Without the cooperation and understanding of the employees' accountable supervisors, this is not achievable.

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Annex I Pilot Study Questionnaire

Relocation Management Questionnaire

Dear Participant:

I am a PhD student at the University of Gloucestershire, UK, currently studying in Germany. For my research thesis I am examining supply chain / production relocation management (SCPRM) practices in companies located in the DACH (Germany, Austria, and Switzerland/Liechtenstein) region to China. Academic research defines relocation management as the transfer of processes and/or activities into other countries. Relocation can be achieved in different ways; the company can outsource these activities to independent companies located in a foreign country (external relocation), or it can perform these activities through its own subsidiary located in another country (internal relocation).

Purpose and Objective of this research:

In view of the background of relocation of high-tech industries, the research problem is encapsulated in the need to enhance a conceptual model for relocation applicable in the user context, in understanding of the lack of previous literature which has investigated relocation phenomena and practises for industrial goods. This study will investigate the current practices for production and supply chain localisation with an emphasis on China for capital equipment as investment in semiconductor, display and the solar industry are still growing in China. This study will identify strategic relocation practises, structure, and summarise existing core competences clusters. Further it will investigate how they are intentionally detected by the involved managers and discover how different concepts or models are introduced to their stakeholders and affect their involved behaviour for relocation decisions. The purpose of this study is to empirically analyse and quantitatively test hypotheses through a cross sectional, self-administered online survey questionnaire, to investigate supply chain / production relocation management (SCPRM) practices in DACH companies for high-technology machinery.

Confidentiality:

This research is conducted on an anonymous basis and completed questionnaires will not be identifiable in any form. In order to ensure that all information will remain confidential, please **do not** include your name or your organization's name in this survey. Participants have the right to withdraw from the questionnaire within 1 week after submission.

Concerns / complaints:

If you have any concerns or complaints about the ethical conduct of this research, you may contact the University Human Research Ethics Committee: secretariat@glos.ac.uk

Participant's benefits:

There is no compensation associated to with participation in this research however participants can request a copy of the summary report of the research findings. The request can be addressed to following email: [REDACTED]. The report will be e-mailed to you once finalized. I am inviting you to participate in this research study by completing the attached questionnaire. The questionnaire will require approximately 15-20 minutes to complete. Please make sure that you fill in all questions in sections A - C.

THANK YOU VERY MUCH FOR YOUR PARTICIPATION, IT IS HIGHLY VALUABLE FOR THIS STUDY AND GREATLY APPRECIATED.

Section A: Relocation Management Questionnaire

Please read each statement carefully. For Question 1 to 36, please circle the number that best represents your response. For example: 7 indicate that you strongly agree with the statement and 1 indicates that you strongly disagree with the statement. If you neither agree nor disagree, mark your response as 4 for "Neither".

	Agree			Neither	Disagree		
	Strongly	Quite	Slightly		Slightly	Quite	Strongly
	7	6	5	4	3	2	1
1. I am fully aware of general requirements and the company strategy for effective internal relocation management.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
2. Implementation of green initiatives and sustainability are important for the top management and reflected in the strategy for relocation, not only for external partners.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
3. My focus is on strategic relocation management, environment impacts (risks from natural events like COVID 19) are not a concern or focus, even for external or internal partner.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
4. Your company have distribution contracts overseas, which support you external outsourcing activities	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
5. I record details of internal relocation issues and the actions that have been put in place to mitigate or avoid future interruptions	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
6. My organization provides relocation management training to our supply chain/operation team to ensure internal relocation performance	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
7. To which extend you agree that over the past 3-5 years the most important challenges in terms of perceived core competences are following a-c:							
a. Functional & technical competence: This competence engages directly with the existing job descriptions or functions in the company and within companies' process model, such as sourcing, manufacturing, and logistic	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
b. Interpersonal & social competence: Handle with interpersonal and social competences between all participants, such as employees, suppliers, partners, managers, customers, and external departments.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
c. Management & behaviour competence: Competences for general management agendas like strategic management, finance (budget, resources and cost), change management and the further strategy of the SCM in the company. Furthermore, mature an innovative and inspired culture within all stakeholders	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
8. I know how to relate relocation management tools and techniques to my company processes and internal decision making.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
9. My organization has a department or individuals entirely dedicated to internal relocation management	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1

10.	The choice of internal offshoring operations requires more regular status management reports to our executive level than external.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
11.	Internal relocation increase the market competitiveness, accessing to new markets and enable new differentiation strategies	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
12.	Most important insecurity and risks in terms of supply chain / operations relocation over past 3-5 years are regulatory, legal, bureaucratic risks	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
13.	Management team meetings with external companies are frequently organized to reflect on relocation management actions	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
14.	Observed other companies exporting similar products with an existing local content increase their success in China	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
15.	Internal or external partner in China seen themselves as/been an important strategic factor for constructive changes	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
16.	The establishment of an ongoing relocation assessment and the development of relocation risk mitigation strategies are important for external activities	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
17.	Negative social pressure against internal relocation is perceived higher in family firms than in non-family firms.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
		Increase			Neither	Decrease		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
18.	I want to _____ the frequency of relocation risk assessments and supplier audits	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
		Agree			Neither	Disagree		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
19.	The fact that my competitors are exploring internal relocation activities will puts pressure on our firm to start with relocation activities	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input checked="" type="radio"/> 2	<input type="radio"/> 1
20.	Human resource capability and infrastructural capacity (space) of the company to implement relocation activities are secured	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
		Frequent			Neither	Infrequent		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
21.	I would rate my usage pattern of strategic relocation management practices as _____.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
		Agree			Neither	Disagree		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
22.	External relocation supports the strategic targets associated with cost reduction	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
23.	I intend to use relocation management tools and techniques when/following relocation activities is/being implemented in my company	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
24.	The top management (Managing Director or equivalent) enhance the relocation management practices of individuals or teams	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1

25.	Overall, my attitude toward internal relocation is favourable compared to external suppliers	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
26.	People whose opinions I value prefer imply in selling products in foreign markets implies high risk	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
27.	I am confident about analytic skills for decision-making relocation in my company and the local companies in China	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
28.	Localisation enable the access to new resources To which extend you agree that over the past 3-5 years to the most important localisation drivers							
a.	Reduce labour costs	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
b.	Access to new markets	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
c.	Access to non-available technology & high skill employees	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
d.	Focus on core competences	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
e.	Follow the competitors	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
f.	Common practice in the industry	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
29.	I expect that our company will use new IT tools or similar type of system for relocation transactions to improve the information flow to the external partners	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
		Wise			Neither	Foolish		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
30.	Turing capabilities into core competencies is a _____ idea.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
		Agree			Neither	Disagree		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
31.	Internal Relocation to China will taking strategic advantage of potential economies of scale	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
32.	I intend to appoint internal or external staff to formally map and rank our relocation targets and activities.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
33.	I am understanding my organization's relocation practices, which allows me to share knowledge with my network in the company and with external partners	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
34.	I intend to use relocation management tools and techniques on a regular basis for external partners	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
35.	Do you agree that listed instruments or tools (a – g), are frequently used by you for your relocation management practices?							
a.	Financial modelling for internal relocation	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
b.	Supply chain / Operations worst case modelling for external partner	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
c.	Approach questioning Standing (e.g., "What if?")	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
d.	Mapping of internal and external processes (Value Stream Mapping)	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1

e.	FMEA (Failure Mode and Effects Analysis)	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
f.	Ishikawa's Diagram, Brainstorming	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
g.	PDCA (Plan, Do, Check, Act), 6σ (6 Sigma, permanent improvement)	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
36.	Strategic relocation activities are entirely within our firm's control	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1

Section B: Company Information

1. Type of control

- no family owned
 family managed

- family owned
 Others (please specify):

2. Company size by number of employees

- Less than 50
 Between 50 and 150

- Between 151 and 300
 More than 300

3. Please tick "✓" at least one (1) main reasons for doing relocation management within your organisation

- Legal, regulatory or compliance requirements
 Requirements from stakeholders
 Requirements from company headquarters
 Operational requirements such as production, quality, cost cutting, etc.

- Corporate social responsibility and ethics requirements
 Supply chain risk management
 Pressure from customers or market

- Others (please specify):

4. Which of the following international relocation activities you will undertake or currently working on in your organisation? (Please tick "✓" at least one (1))

- Production and Purchasing
 R&D and Product development
 Sales & Marketing

- After Sales and Service
 Finance , HR and IT
 Others (please specify):

5. Which of the following relocation modes you will undertake or establish in the next three to five years in China?

- Internal offshoring operations
 Concurrent offshoring operations

- External offshoring operations
 none or back-shoring

6. Location of your company

Germany

Austria

Switzerland / Liechtenstein

Section C: About You

1. My position in the company

- C-level Executive /MD (CEO; CFO; COO; CRO; etc.) Department Head / Head of supply chain/procurement etc
- Management level/ Supply Chain / Manager / Procurement Manager Middle Management / Procurement Officer / Supply Chain Officer etc.

2. How much experience do you have in relocation management?

- Less than 3 years Between 7 to 10 years
- Between 3 and 6 years More than 10 years

3. Gender

- Female Male

4. Age

- Below 30 30 - 39 40 - 49 50 and above

5. Highest education level

- Post graduate or above Undergraduate university A - Level High school diploma or less

THANK YOU VERY MUCH FOR YOUR PARTICIPATION – IT IS HIGHLY VALUABLE FOR THIS STUDY AND GREATLY APPRECIATED

Annex II Main Study Questionnaire

Relocation Management Questionnaire

Dear Participant:

I am a PhD student at the University of Gloucestershire, UK, currently studying in Germany. For my research thesis I am examining supply chain / production relocation management (SCPRM) practices in companies located in the DACH (Germany, Austria, and Switzerland/Liechtenstein) region to China. Academic research defines relocation management as the transfer of processes and/or activities into other countries. Relocation can be achieved in different ways; the company can outsource these activities to independent companies located in a foreign country (external relocation), or it can perform these activities through its own subsidiary located in another country (internal relocation).

Purpose and Objective of this research:

In view of the background of relocation of high-tech industries, the research problem is encapsulated in the need to enhance a conceptual model for relocation applicable in the user context, in understanding of the lack of previous literature which has investigated relocation phenomena and practises for industrial goods. This study will investigate the current practices for production and supply chain localisation with an emphasis on China for capital equipment as investment in semiconductor, display and the solar industry are still growing in China. This study will identify strategic relocation practises, structure, and summarise existing core competences clusters. Further it will investigate how they are intentionally detected by the involved managers and discover how different concepts or models are introduced to their stakeholders and affect their involved behaviour for relocation decisions. The purpose of this study is to empirically analyse and quantitatively test hypotheses through a cross sectional, self-administered online survey questionnaire, to investigate supply chain / production relocation management (SCPRM) practices in DACH companies for high-technology machinery.

Confidentiality:

This research is conducted on an anonymous basis and completed questionnaires will not be identifiable in any form. In order to ensure that all information will remain confidential, please **do not** include your name or your organization's name in this survey. Participants have the right to withdraw from the questionnaire within 1 week after submission.

Concerns / complaints:

If you have any concerns or complaints about the ethical conduct of this research, you may contact the University Human Research Ethics Committee: secretariat@glos.ac.uk

Participant's benefits:

There is no compensation associated to with participation in this research however participants can request a copy of the summary report of the research findings. The request can be addressed to following email: s1731631@connect.glos.co.uk. The report will be e-mailed to you once finalized. I am inviting you to participate in this research study by completing the attached questionnaire. The questionnaire will require approximately 15-20 minutes to complete. Please make sure that you fill in all questions in sections A - C.

THANK YOU VERY MUCH FOR YOUR PARTICIPATION, IT IS HIGHLY VALUABLE FOR THIS STUDY AND GREATLY APPRECIATED.

Section A: Relocation Management Questionnaire

Please read each statement carefully. For Question 1 to 23, please circle the number that best represents your response. For example: 7 indicate that you strongly agree with the statement and 1 indicates that you strongly disagree with the statement. If you neither agree nor disagree, mark your response as 4 for "Neither".

To which extent would you agree with the following statements?		Agree			Neither	Disagree		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
		7	6	5	4	3	2	1
1.	I have the resources, knowledge, and the ability to start with relocation activities.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
2.	Your company has distribution channel contracts overseas, which support your outsourcing activities.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
3.	I record details of internal relocation issues and the actions that have been put in place to mitigate or avoid future interruptions.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
4.	To which extent do you agree that over the past 3-5 years the most important challenges in terms of perceived core competences are following a-c:							
a.	Functional & technical competence: This competence engages directly with the existing job descriptions or functions in the company and within companies' process model, such as sourcing, manufacturing, and logistic	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
b.	Interpersonal & social competence: Handle with interpersonal and social competences between all participants, such as employees, suppliers, partners, managers, customers, and external departments.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
c.	Management & behaviour competence: Competences for general management agendas like strategic management, finance (budget, resources and cost), change management and the further strategy of the SCM in the company. Furthermore, mature an innovative and inspired culture within all stakeholders	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
5.	I know how to relate relocation management tools and techniques to my company processes and internal decision making.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
6.	My organization has a department or individuals entirely dedicated to internal relocation.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
7.	Management team meetings with external companies are frequently organized to reflect on relocation management actions.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
8.	Observed other companies exporting similar products with an existing local content has increased their success in China.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
9.	Internal or external partners in China see themselves as/been an important strategic factor for constructive changes.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
10.	Relocation activities have become part of my routine.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
11.	Negative social pressure against internal relocation is perceived higher in family firms than in non-family firms.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1

	With which expression would you agree to the following statements?	Increase			Neither	Decrease		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
12.	I want to _____ the frequency of relocation risk assessments and supplier audits	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
	To which extent would you agree with the following statements?	Agree			Neither	Disagree		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
13.	The fact that my competitors are exploring internal relocation activities will put pressure on our company to start with relocation activities.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
14.	Human resource capability and infrastructural capacity (space) of the company to implement relocation activities are secured.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
	To which extent would you agree with the following statements?	Agree			Neither	Disagree		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
15.	External relocation supports the strategic targets associated with cost reduction	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
16.	I intend to use relocation management tools and techniques when relocation activities are/being implemented in my company.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
17.	The top management (Managing Director or equivalent) enhances the relocation management practices of individuals or teams.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
18.	I am understanding my organization's relocation practices, which allows me to share knowledge with my network in the company and with external partners	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
19.	I am confident about analytic skills for decision-making relocation in my company and the local companies in China	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
20.	Localisation enables the access to new resources. To which extent do you agree to the most important localisation drivers over the past 3-5 years?							
a.	Reduce labour costs	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
b.	Access to new markets	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
c.	Access to non-available technology & high skill employees	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
d.	Focus on core competences	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
e.	Follow the competitors	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
f.	Common practice in the industry	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
21.	I intend to use relocation management tools and techniques on a regular basis for external partners	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
	With which expression would you agree to the following statements?	Wise			Neither	Foolish		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
22.	Turning capabilities into core competencies is a _____ idea.	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1

	To which extent would you agree with the following statements?	Agree			Neither	Disagree		
		Strongly	Quite	Slightly		Slightly	Quite	Strongly
23.	Internal relocation to China will take strategic advantage of potential economies of scale	<input type="radio"/> 7	<input type="radio"/> 6	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1

Section B: Company Information

1. Type of control

- no family owned
 family managed

- family owned
 Others (please specify):

2. Company size by number of employees

- Less than 50
 Between 50 and 150

- Between 151 and 300
 More than 300

3. Please tick "✓" at least one (1) main reasons for doing relocation management within your organisation

- Legal, regulatory or compliance requirements
 Requirements from stakeholders
 Requirements from company headquarters
 Operational requirements such as production, quality, cost cutting, etc.
- Corporate social responsibility and ethics requirements
 Supply chain risk management
 Pressure from customers or market
 Others (please specify):

4. Which of the following international relocation activities will you undertake or are you currently working on in your organisation? (Please tick "✓" at least one (1))

- Production and Purchasing
 R&D and Product development
 Sales & Marketing
- After Sales and Service
 Finance , HR and IT
 Others (please specify):

5. Which of the following relocation modes will you undertake or establish in the next three to five years in China?

- Internal offshoring operations
 Concurrent offshoring operations
- External offshoring operations
 none or back-shoring

6. Location of your company

- Germany
 Austria
 Switzerland / Liechtenstein

Section C: About You

1. My position in the company

- C-level Executive /MD (CEO; CFO; COO; CRO; etc.) Department Head / Head of supply chain/procurement etc
- Senior Management level/ Supply Chain / Manager / Procurement Middle Management / Procurement Officer / Supply Chain Officer etc.

2. How much experience do you have in relocation management?

- Less than 3 years Between 7 to 10 years
- Between 3 and 6 years More than 10 years

3. Gender

- Female Male

4. Age

- Below 30 30 - 39 40 - 49 50 and above

5. Highest education level

- Post graduate or above Undergraduate university A - Level High school diploma or less

THANK YOU VERY MUCH FOR YOUR PARTICIPATION – IT IS HIGHLY VALUABLE FOR THIS STUDY AND GREATLY APPRECIATED

Annex III Additional Figures for Survey Sections A

The descriptive statistics associated to respondents' selection are presented statistically in Table xx to xxx and visualised in Figure xx to xx.

	My position in the company			
	C-level Executive / MD (CEO)	Department Head / Head of supply chain/procurement etc	Management level / Supply Chain / Manager / Procurement Manager	Middle Management / Procurement Officer / Supply Chain Officer etc.
Attitude of the motivation for localisation driver (ALD)	4.61	4.93	4.75	4.86
Attitude of management support for SCPRM (AMS)	3.95	4.28	4.46	4.79
Attitude of perceived development of core competences (APDCC)	5.01	5.20	5.18	5.20
Attitude of level of understanding for relocation management (ALOUR)	4.92	4.85	4.87	4.90
Perceived behaviour control (PBC)	4.25	4.24	4.07	4.59
Social pressure (SP)	4.56	4.82	4.78	4.87
Managers intention toward relocation mode choice (MIRM)	4.39	4.24	4.47	4.69

Table 68 Mean scored of constructs within participants position in the company

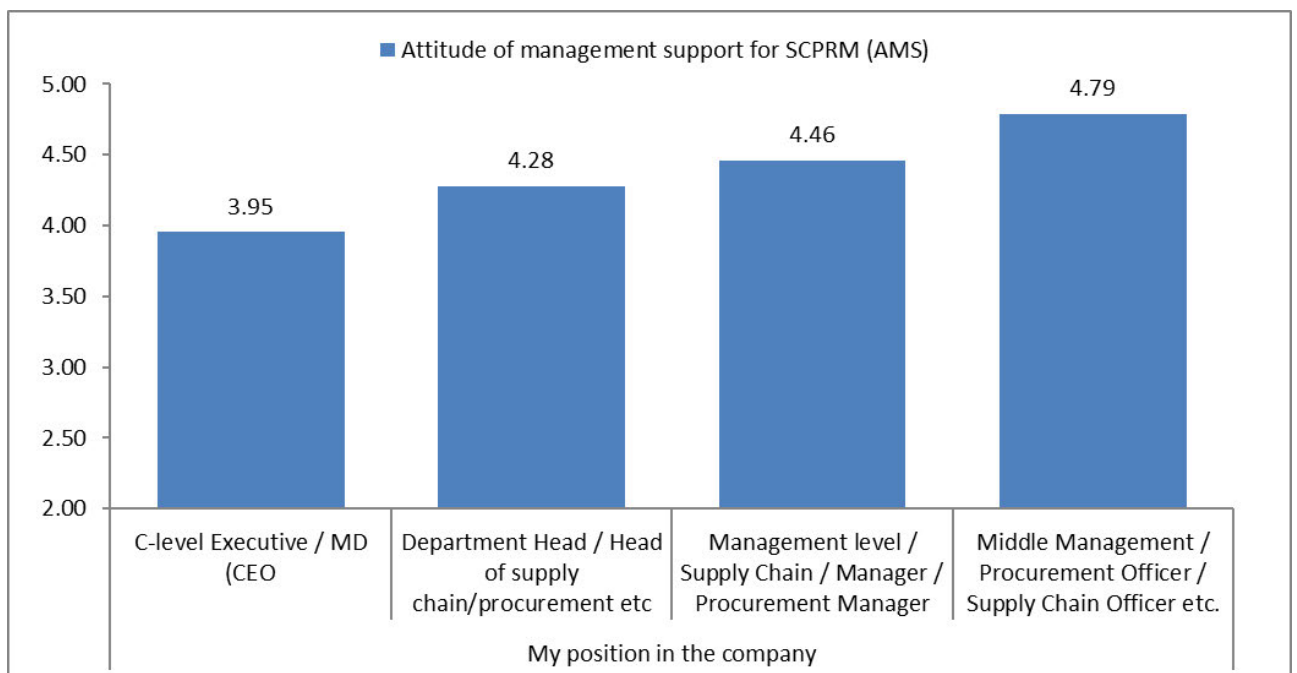


Figure 30 Mean scored Attitude of management support (AMS) within participants position in the company

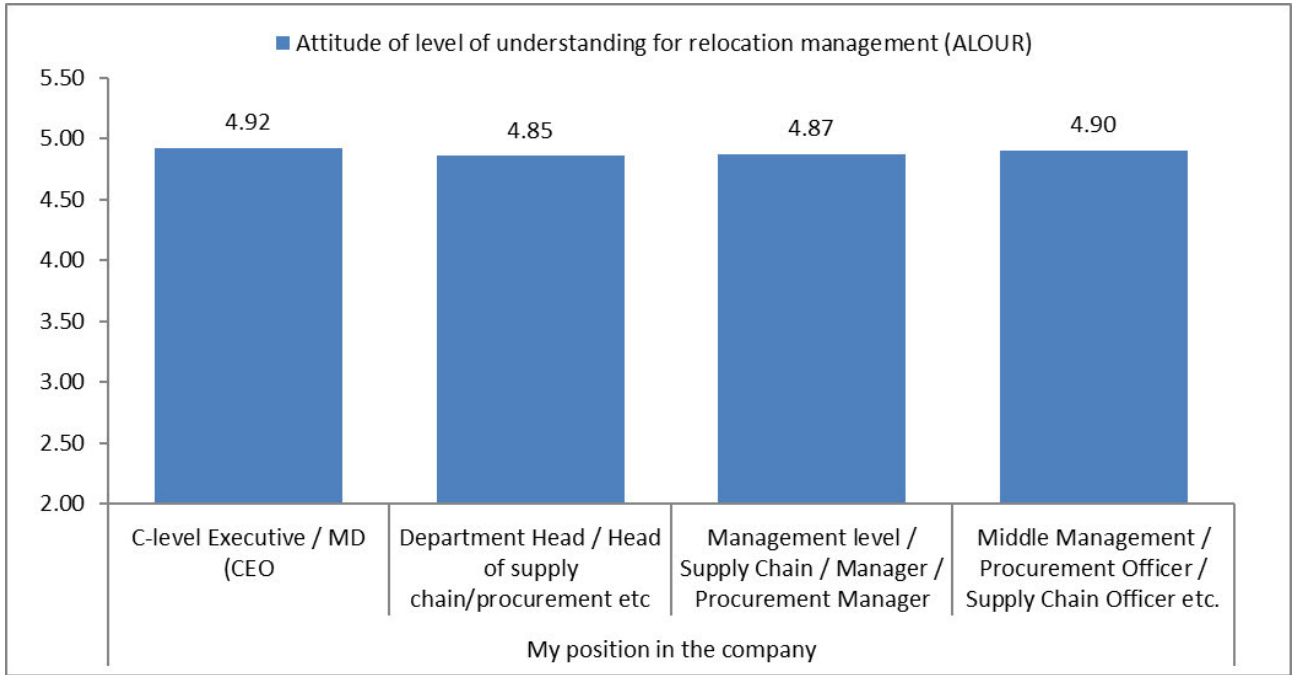


Figure 31 Mean scored construct Attitude of level of understanding for relocation management (ALOUR) within participants position in the company

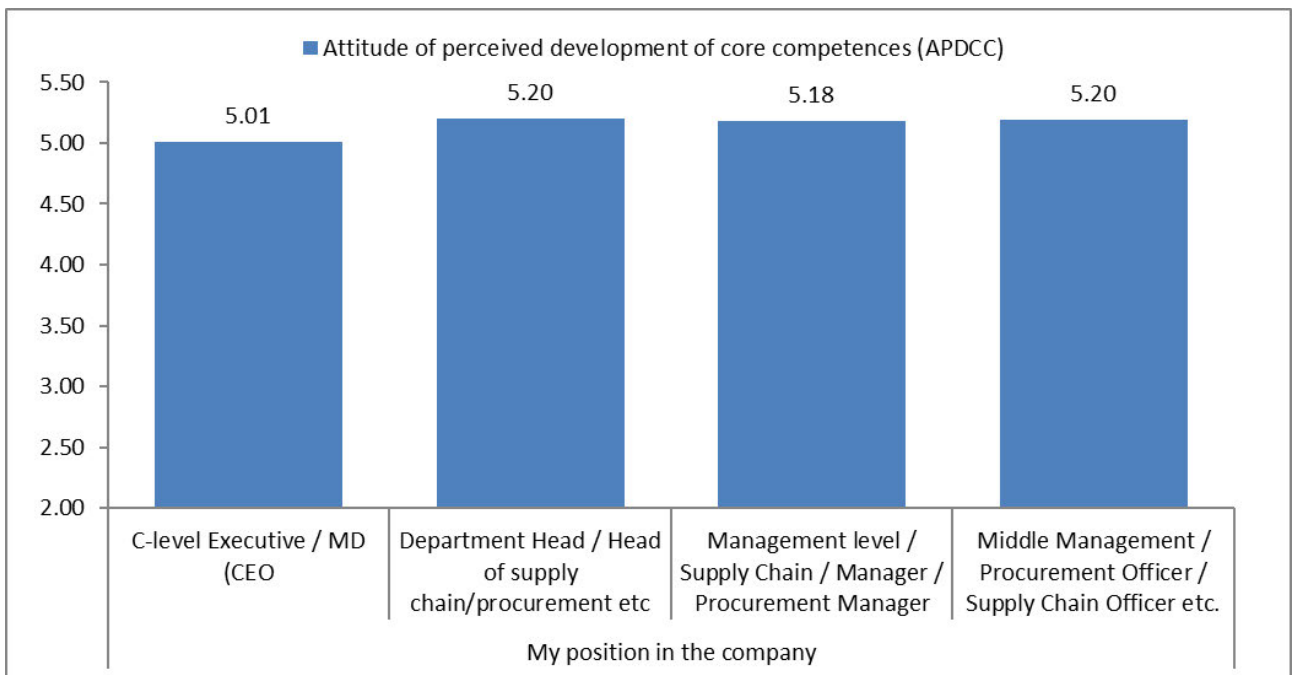


Figure 32 Mean scored construct Attitude of perceived development of core competencies (APDCC) within participants position in the company

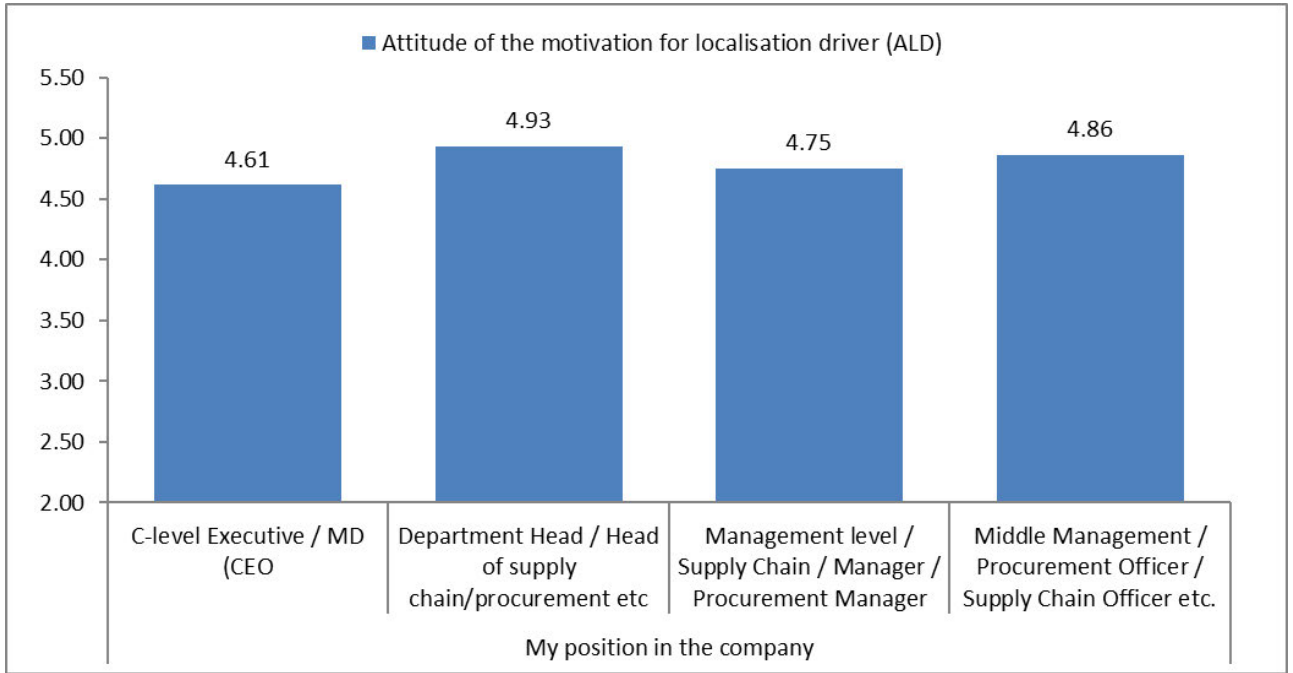


Figure 33 Mean scored construct Attitude of the motivation for localization driver (ALD) within participants position in the company

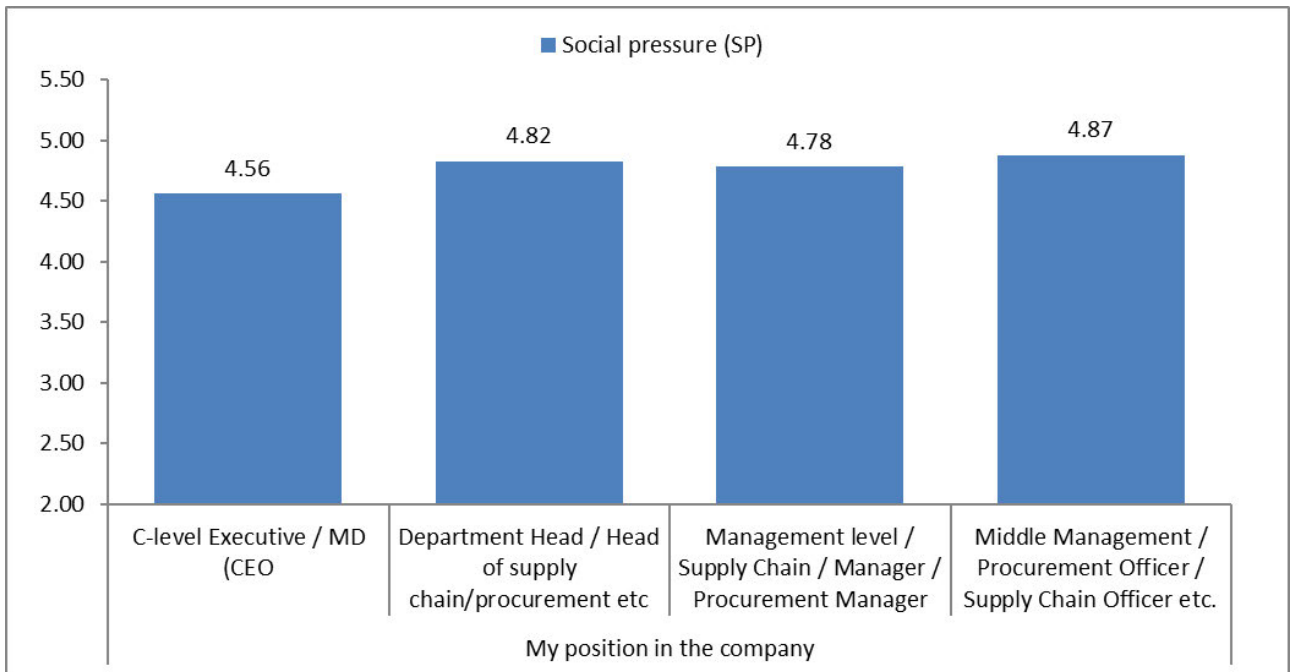


Figure 34 Mean scored construct Social pressure (SP) within participants position in the company

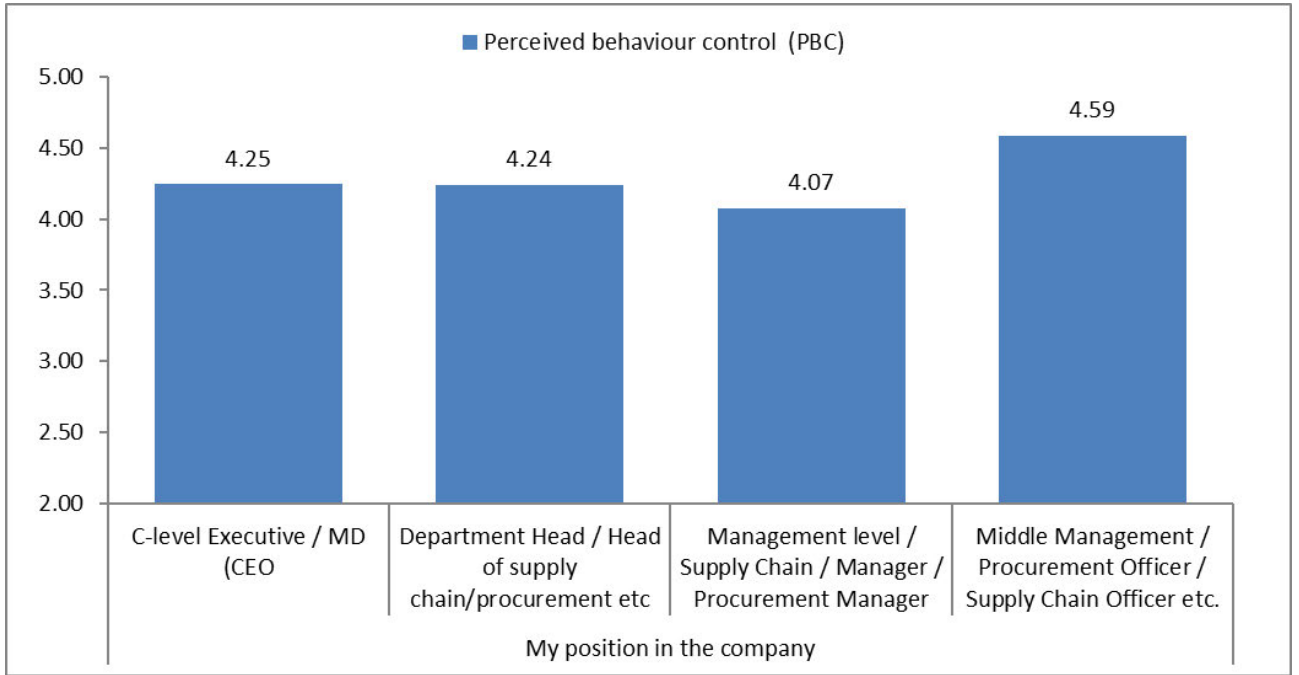


Figure 35 Mean scored construct Perceived behaviour control (PBC) within participants position in the company

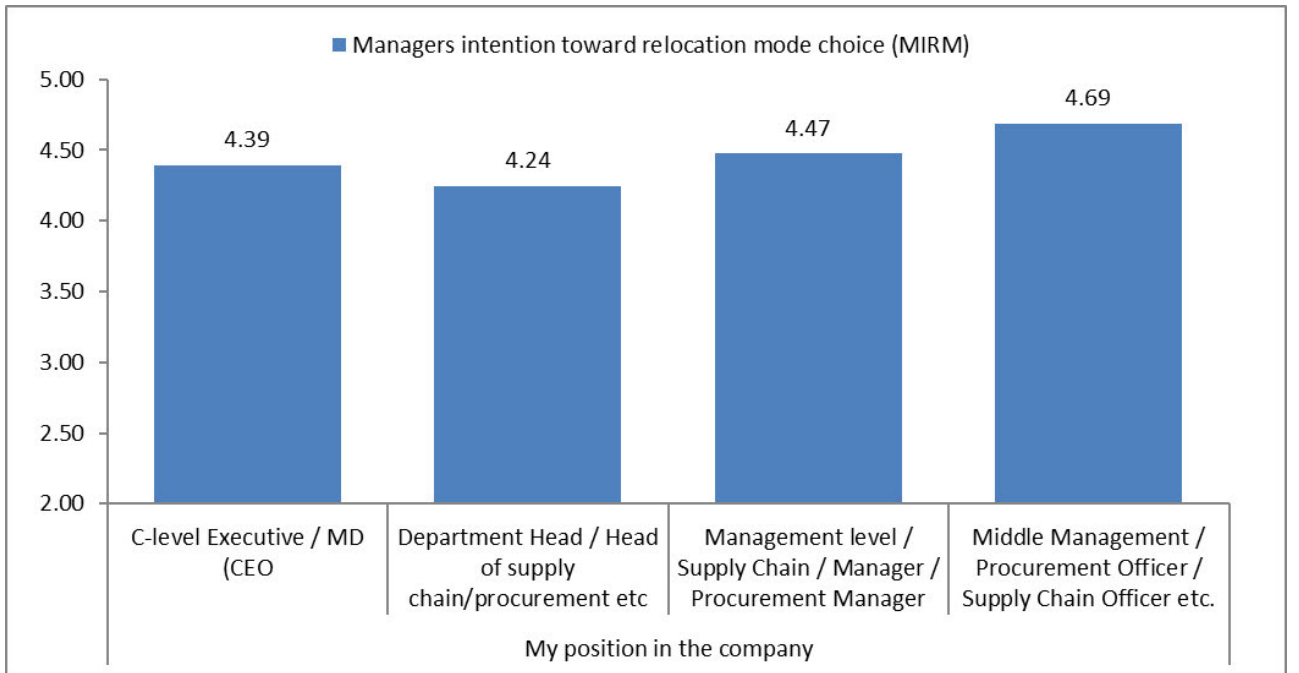


Figure 36 Mean scored construct Managers intention toward relocation mode choice (MIRM) within participants position in the company

	Age			
	Below 30	30 - 39	40 -49	50 and above
Attitude of the motivation for localisation driver (ALD)	5.11	4.49	4.85	4.77
Attitude of management support for SCPRM (AMS)	5.50	4.24	4.35	4.40
Attitude of perceived development of core competences (APDCC)	5.50	4.87	5.11	5.24
Attitude of level of understanding for relocation management (ALOUR)	5.67	4.64	4.90	4.84
Perceived behaviour control (PBC)	5.58	3.95	4.16	4.32
Social pressure (SP)	5.17	4.66	4.80	4.71
Managers intention toward relocation mode choice (MIRM)	5.33	4.50	4.36	4.46

Table 69 Mean scored of constructs within age groups

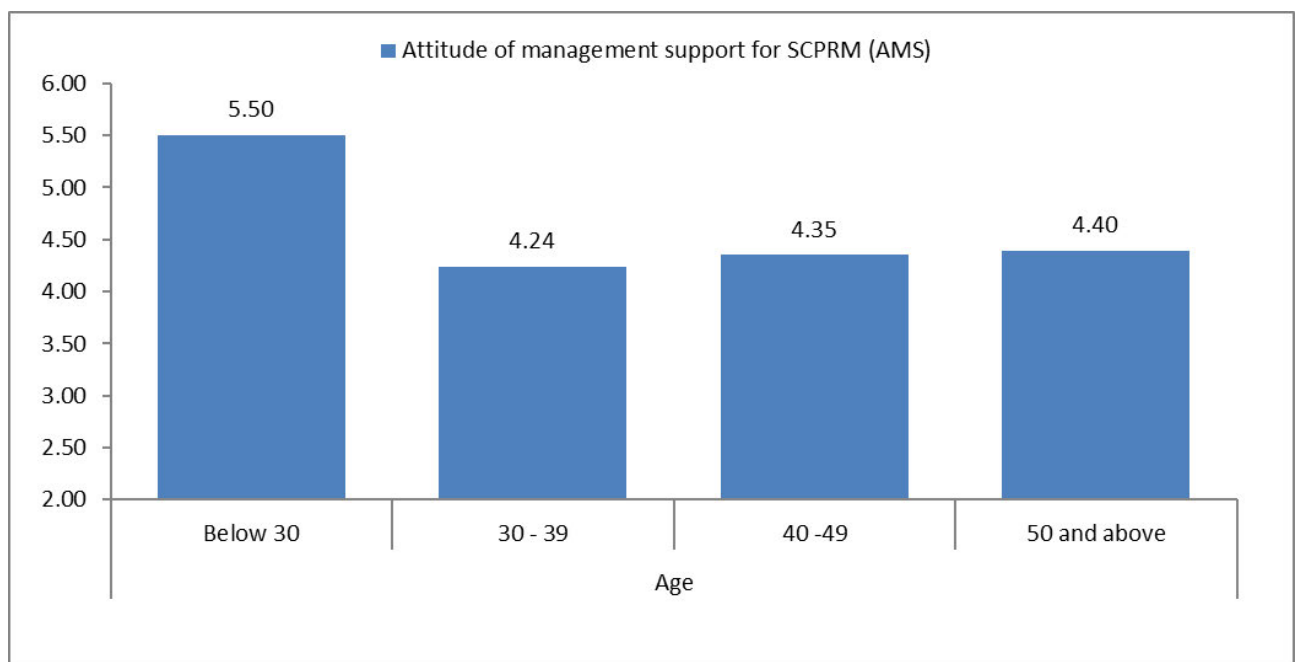


Figure 37 Mean scored Attitude of management support (AMS) within age groups

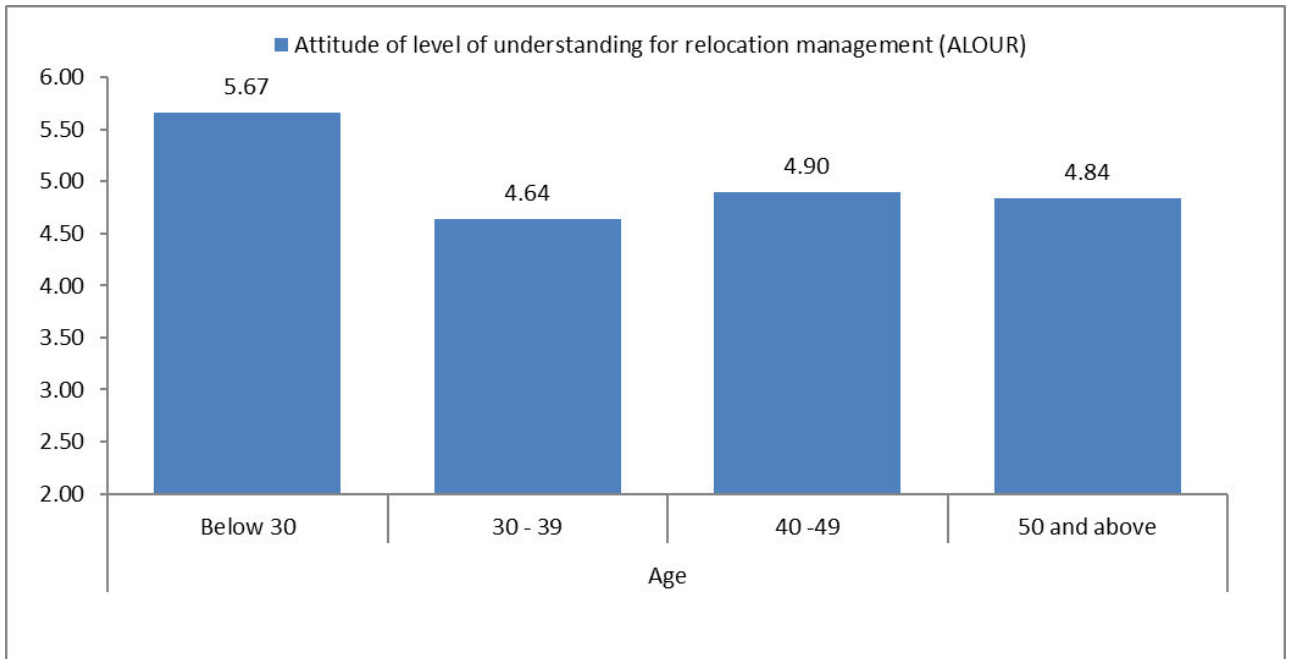


Figure 38 Mean scored Attitude of level of understanding for relocation management (ALOUR) within age groups

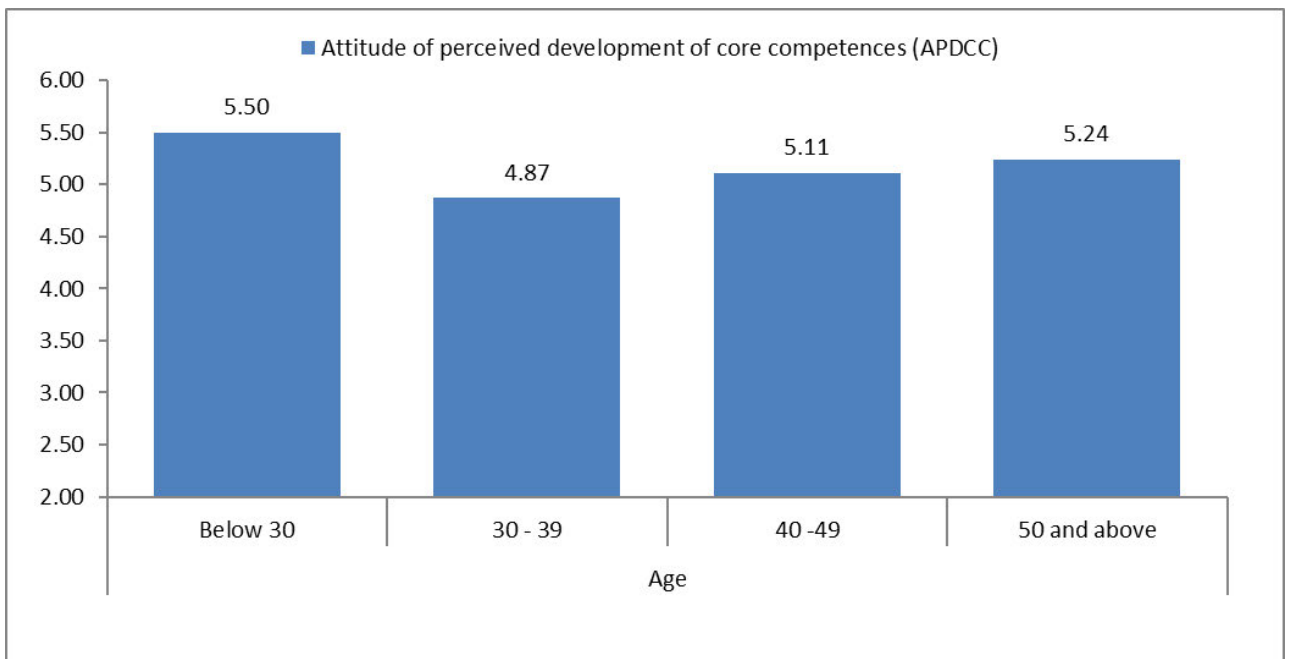


Figure 39 Mean scored Attitude of perceived development of core competencies (APDCC) within age groups

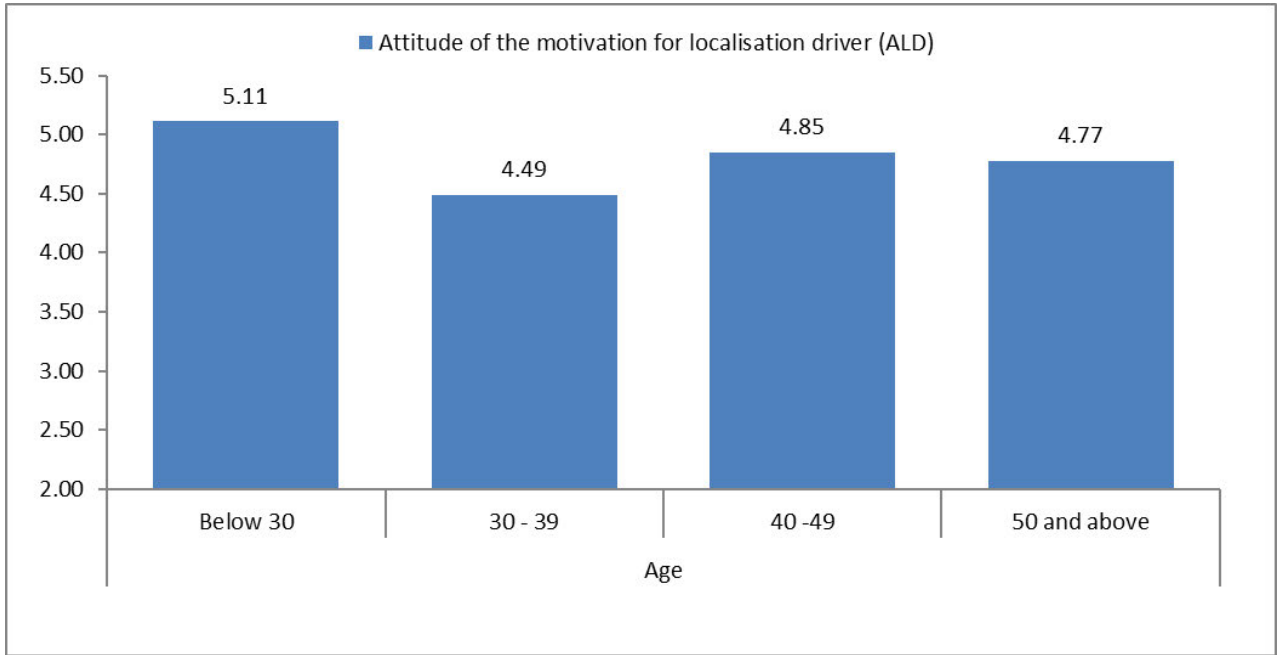


Figure 40 Mean scored Attitude of the motivation for localization driver (ALD) within age groups

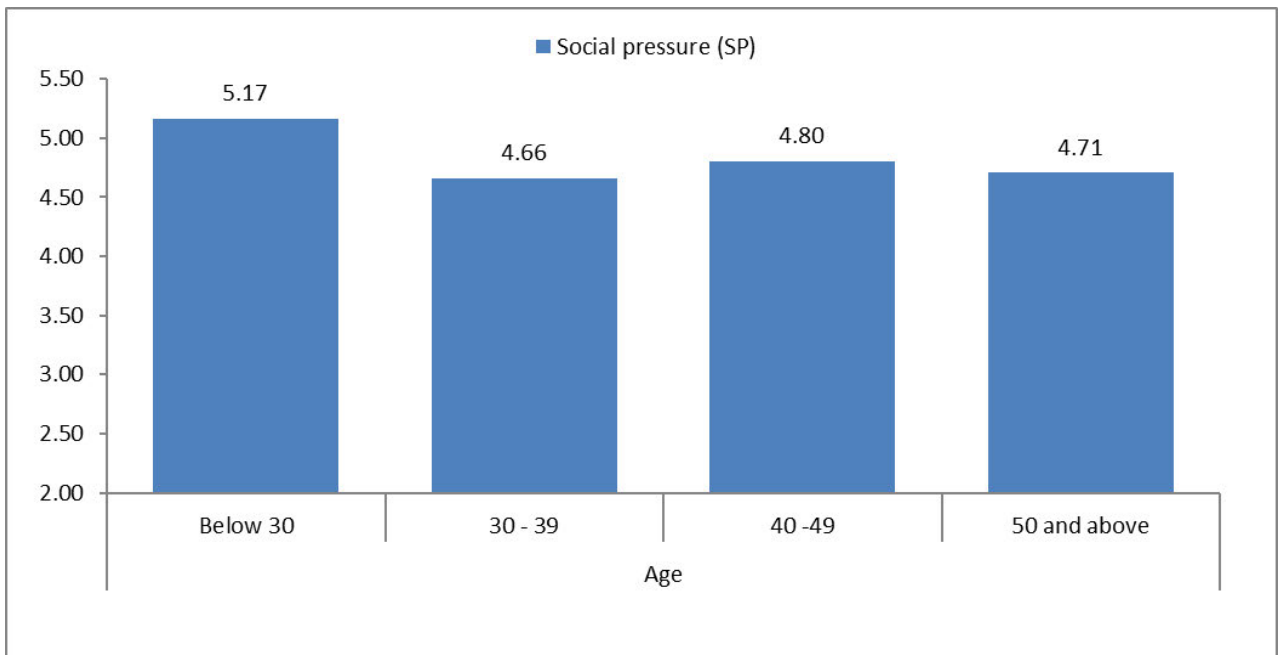


Figure 41 Mean scored Social pressure (SP) within age groups

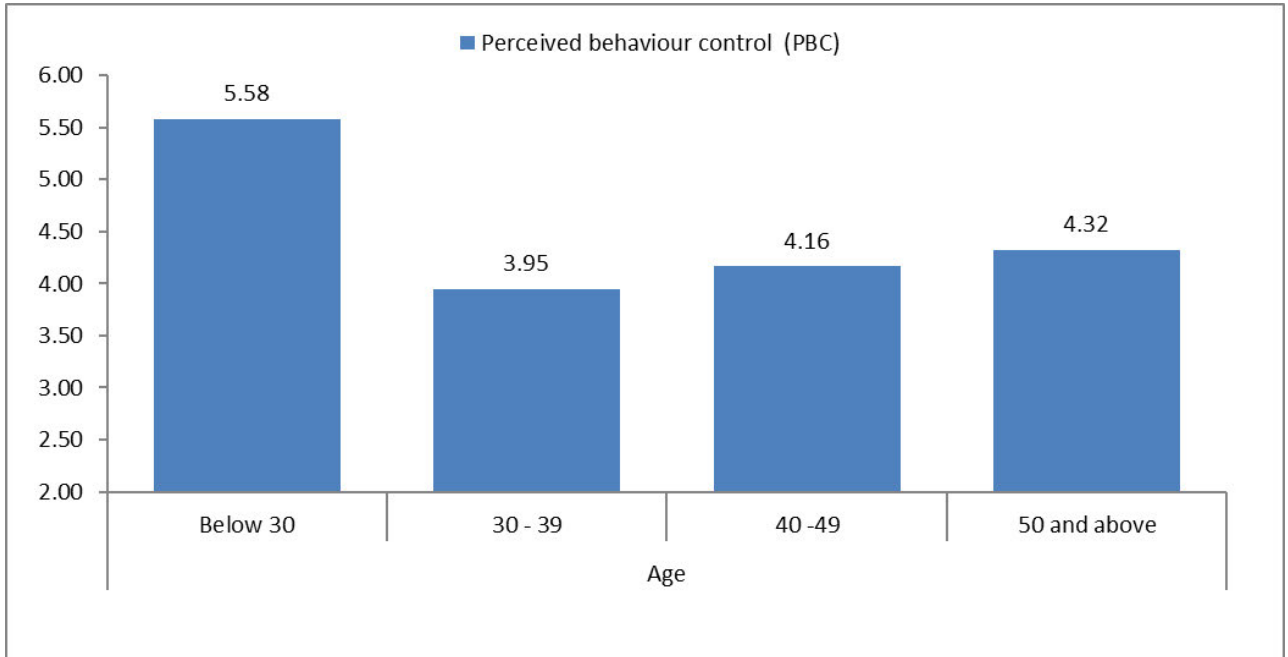


Figure 42 Mean scored Perceived behaviour control (PBC) within age groups

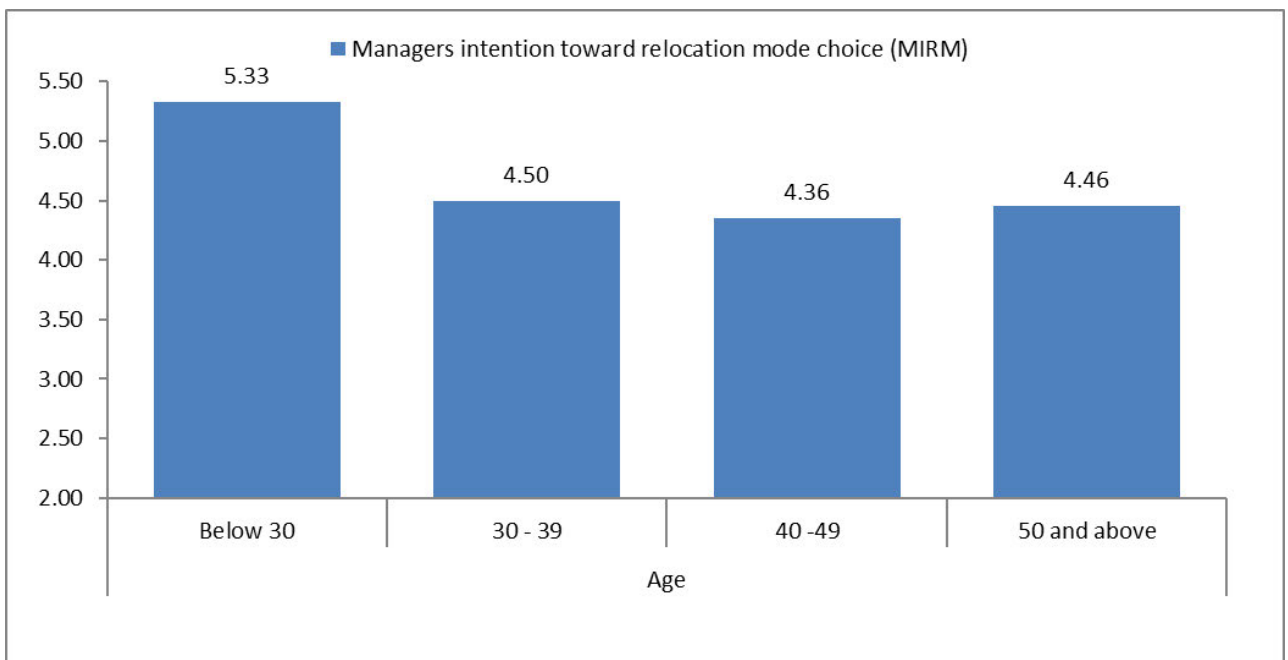


Figure 43 Mean scored Managers intention toward relocation mode choice (MIRM) within age groups

	relocation modes			
	Internal offshoring operations	External offshoring operations	Concurrent offshoring operations	no or back-shoring
Attitude of the motivation for localisation driver (ALD)	5.08	4.40	5.02	4.53
Attitude of management support for SCPRM (AMS)	4.61	4.11	4.69	4.05
Attitude of perceived development of core competences (APDCC)	5.29	4.97	5.30	5.12
Attitude of level of understanding for relocation management (ALOUR)	4.99	4.70	5.17	4.61
Perceived behaviour control (PBC)	4.36	4.05	4.63	4.24
Social pressure (SP)	4.93	4.50	4.86	4.74
Managers intention toward relocation mode choice (MIRM)	4.55	4.00	4.60	5.53

Table 70 Mean scored of constructs within relocation modes

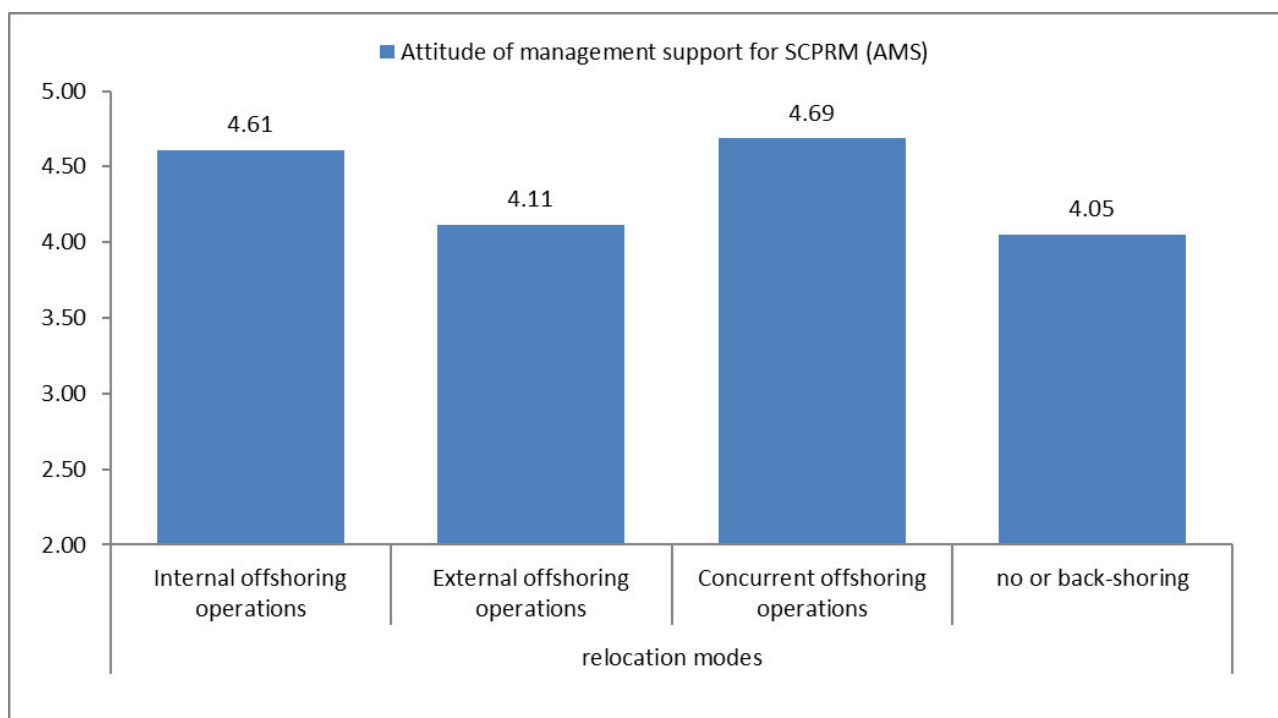


Figure 44 Mean scored Attitude of management support (AMS) within relocation modes

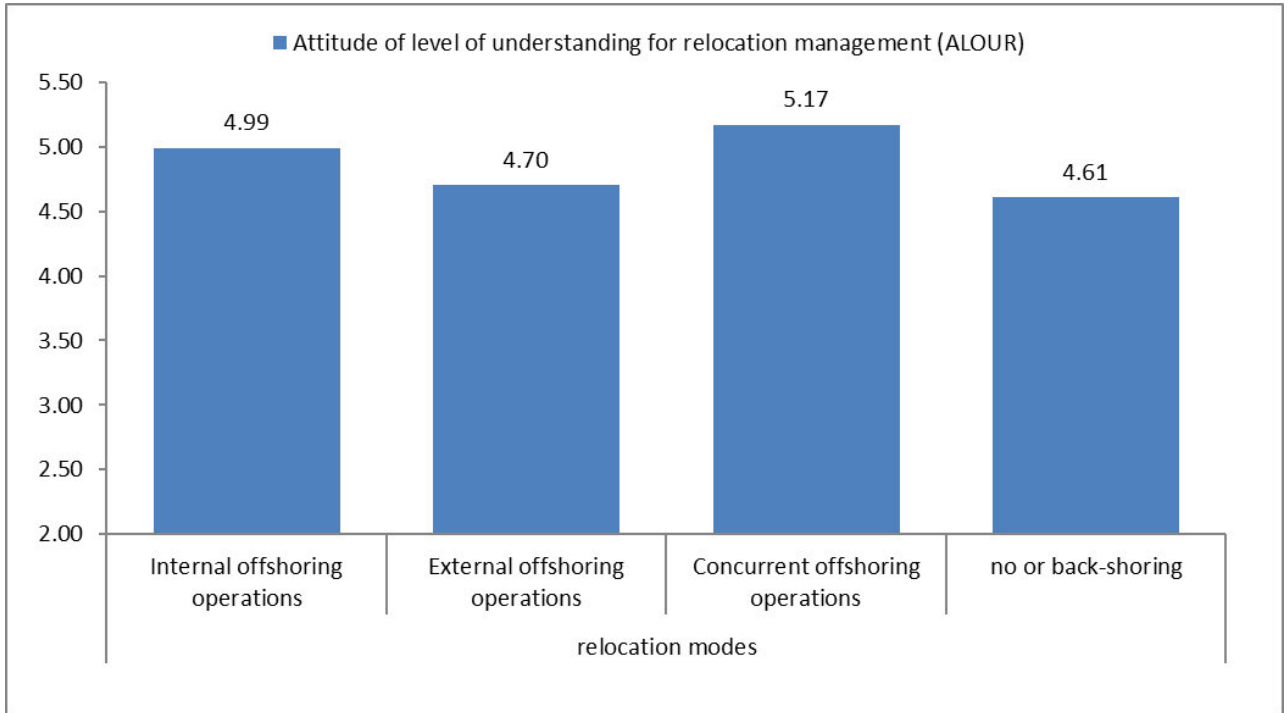


Figure 45 Mean scored Attitude of level of understanding for relocation management (ALOUR) within relocation modes

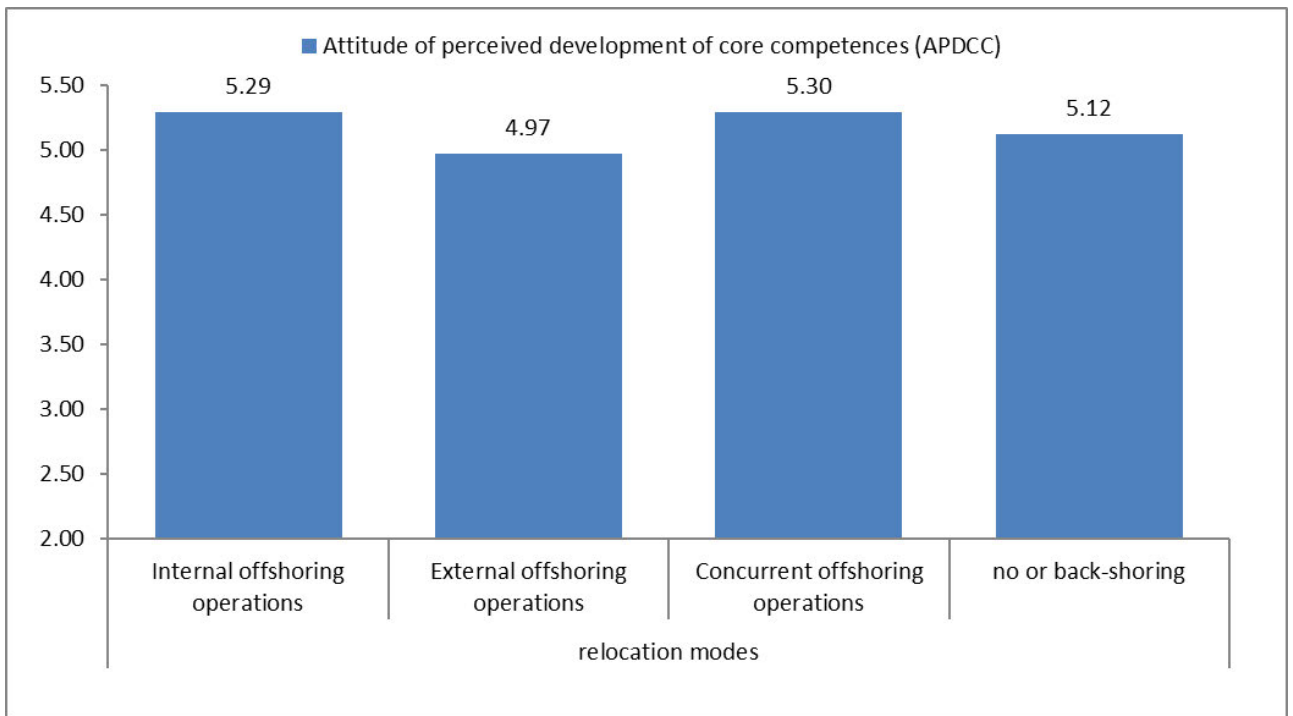


Figure 46 Mean scored Attitude of perceived development of core competencies (APDCC) within relocation modes

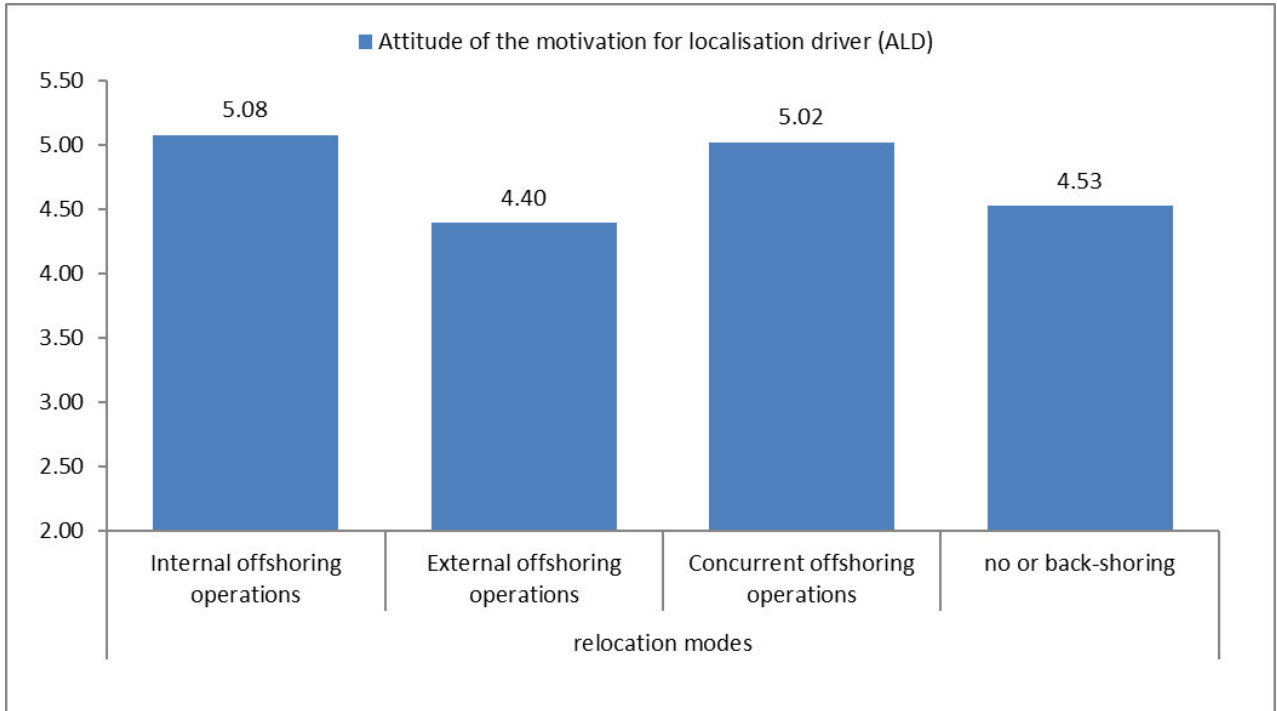


Figure 47 Mean scored Attitude of the motivation for localization driver (ALD) within relocation modes

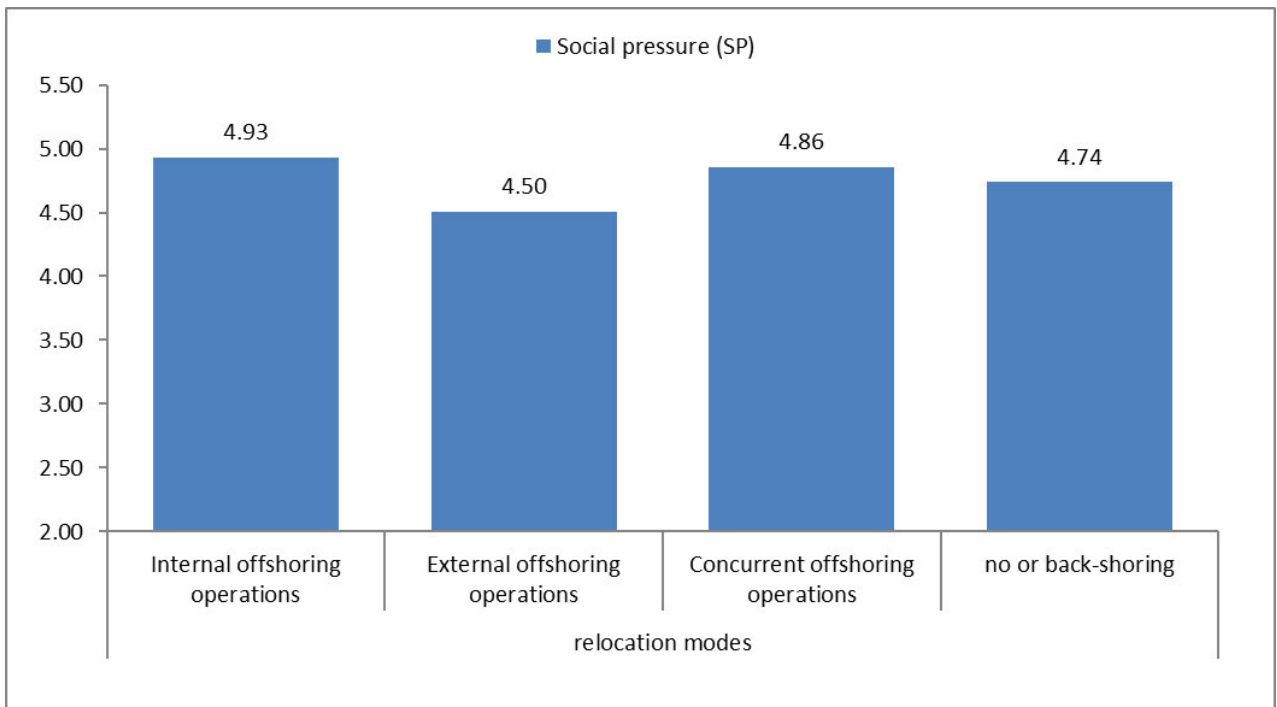


Figure 48 Mean scored Social pressure (SP) within relocation modes

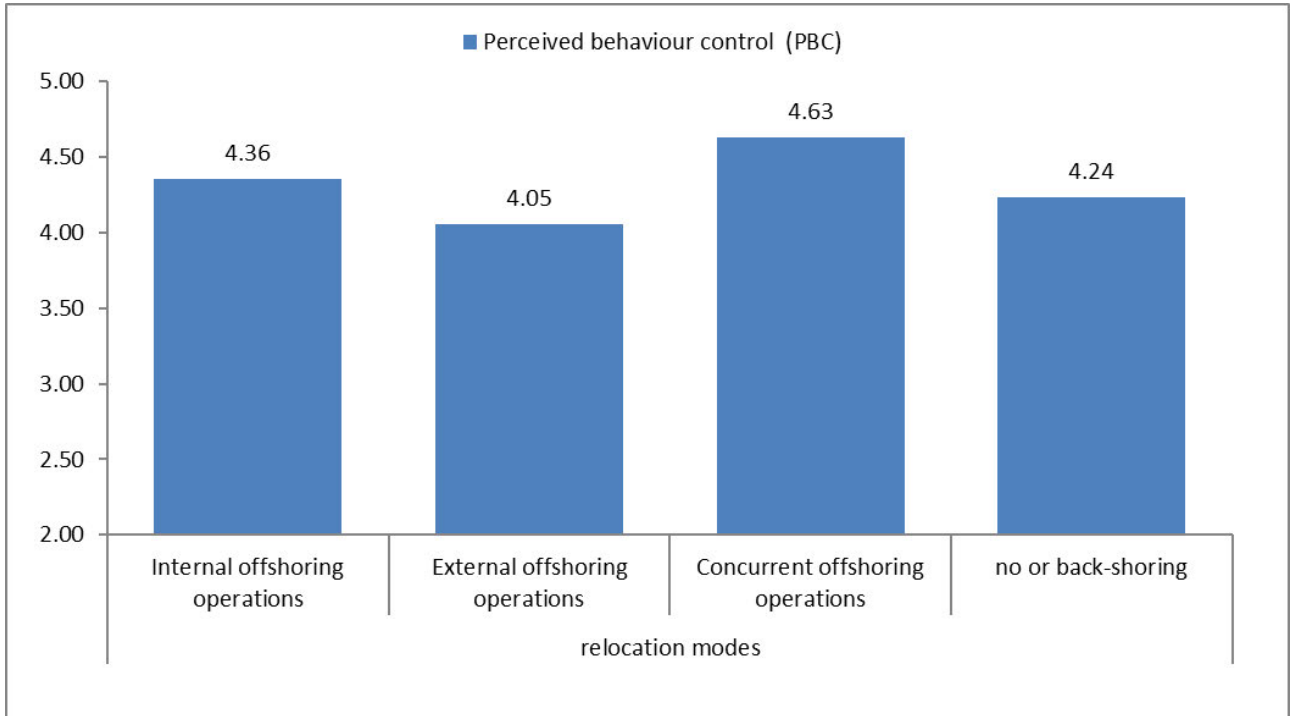


Figure 49 Mean scored Perceived behaviour control (PBC) within relocation modes

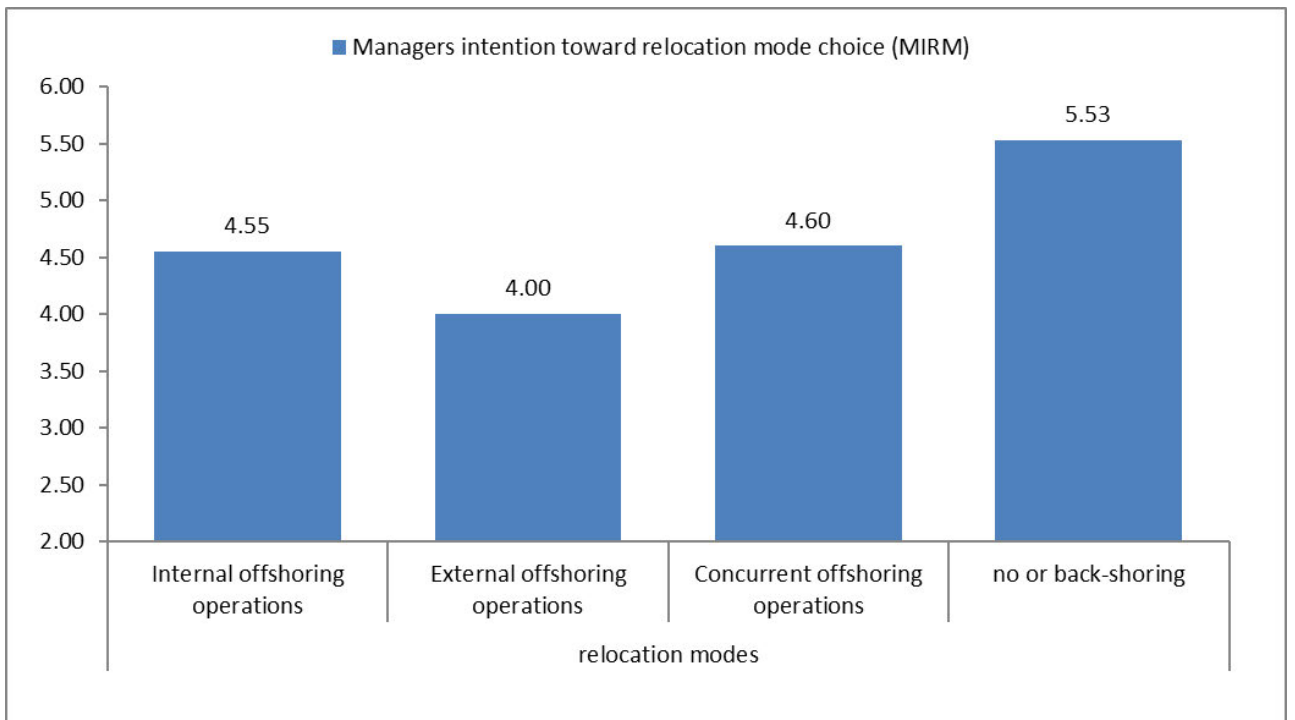


Figure 50 Mean scored Managers intention toward relocation mode choice (MIRM) within relocation modes

Annex IV Additional Figures for Survey Sections B and C

For the calculated tables of the statistics stated in section 7.2, charts are shown.

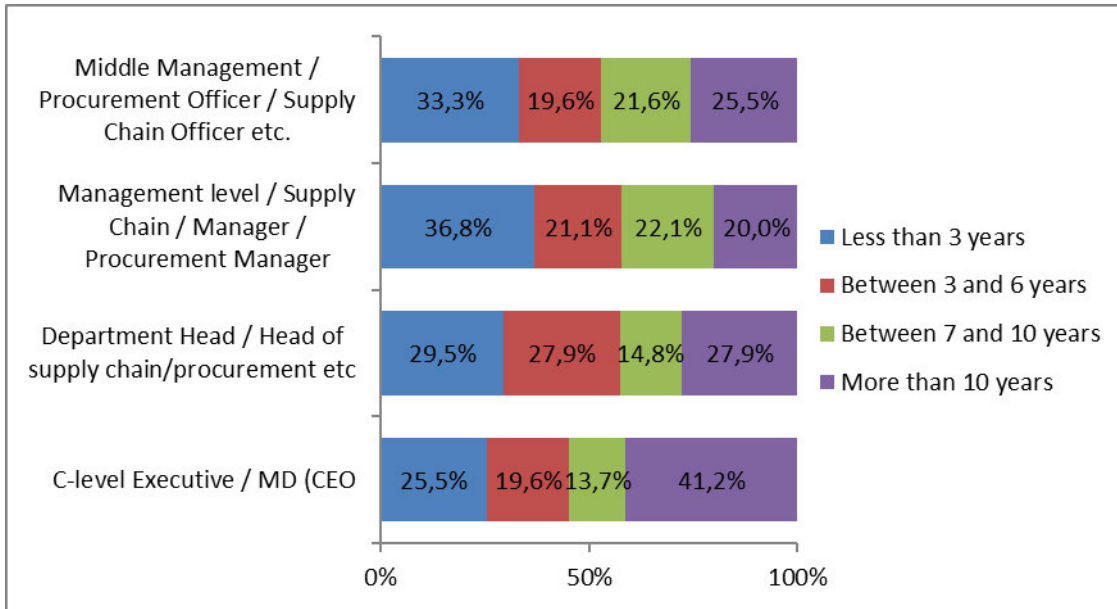


Figure 51 Years of experience in relation to position as percentage within position in the company

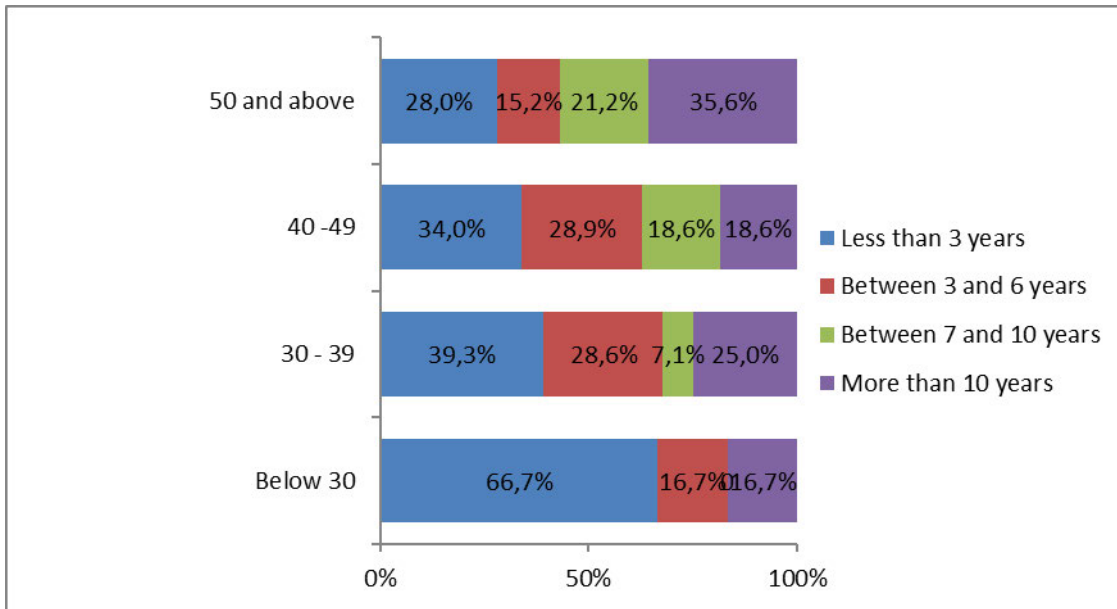


Figure 52 Years of experience in relation to age as percentage within age categories

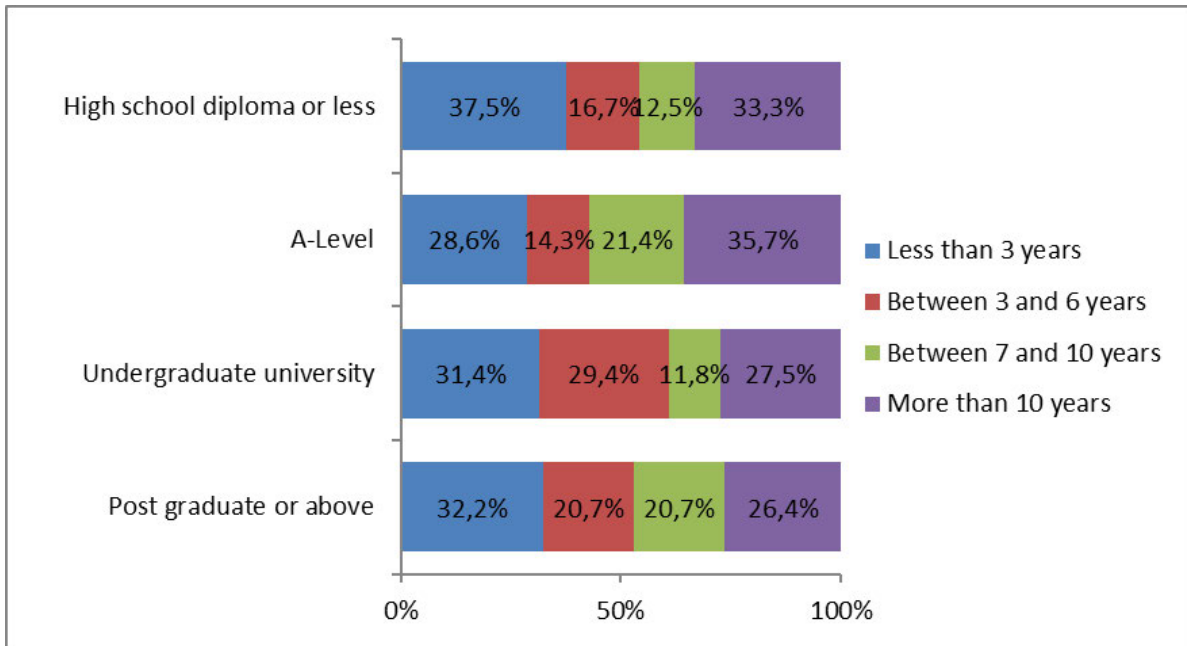


Figure 53 Years of experience in relation to highest education level as a percentage within education groups

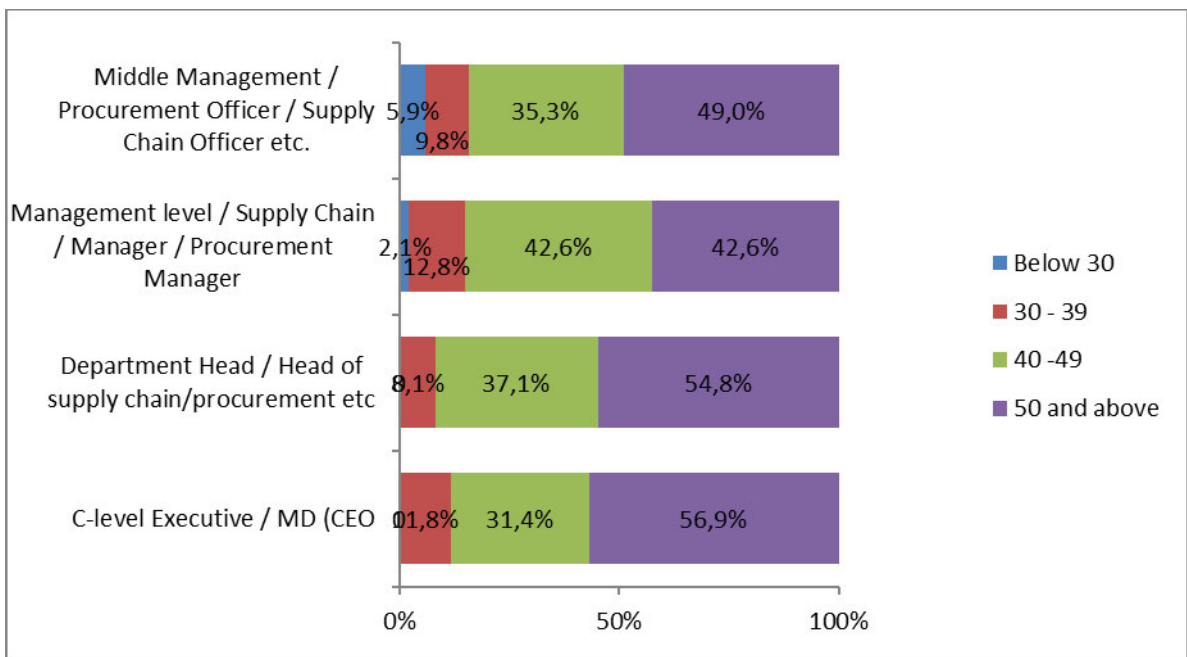


Figure 54 Relationship between age and position in the company as a percentage within position categories

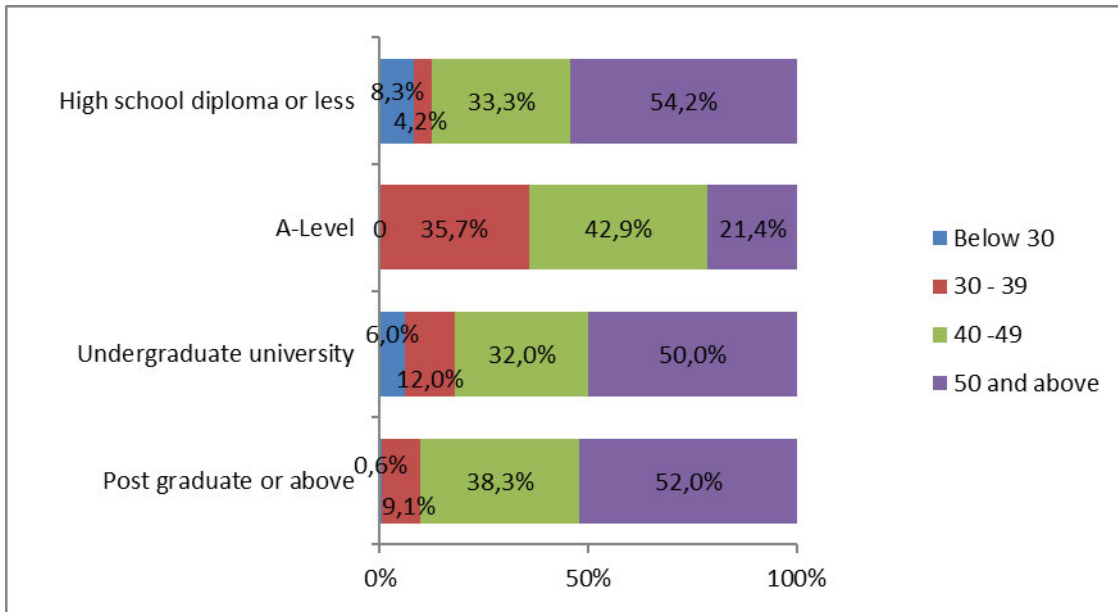


Figure 55 Relationship between participants' claimed ages and educational levels

Annex V Table for assessment of outliers

Observations farthest from the centroid (Mahalanobis distance), chapter 7.4.2

id	mahalanobis distance	mahalanobis distance p value	outlier based on alpha 0.01
142	93.289	0.000	yes
3	85.908	0.000	yes
89	72.728	0.000	yes
79	71.830	0.000	yes
116	68.456	0.000	yes
209	63.884	0.000	yes
132	61.202	0.000	yes
47	60.269	0.000	yes
87	56.550	0.000	yes
10	55.035	0.000	yes
19	53.232	0.000	yes
178	52.179	0.000	yes
263	51.524	0.000	yes
82	50.826	0.000	yes
41	47.159	0.001	no
140	46.106	0.001	no
52	45.105	0.002	no
159	44.176	0.002	no
181	44.167	0.002	no
200	43.733	0.003	no
123	42.561	0.004	no
115	41.294	0.005	no
195	40.457	0.007	no
72	40.215	0.007	no
105	40.144	0.007	no
14	40.046	0.007	no
114	39.137	0.009	no
268	38.348	0.012	no
126	38.098	0.013	no
143	37.626	0.014	no
154	36.459	0.019	no
4	36.418	0.020	no
63	36.354	0.020	no
177	35.938	0.022	no
42	35.614	0.024	no
127	35.362	0.026	no
183	35.186	0.027	no

Table 71 Outliers (Mahalanobis distance)