

**Expanding Boundaries from a Supply Chain Perspective:  
Determinants of Backward Integration Through Mergers and Acquisitions**

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**Doctor of Philosophy**

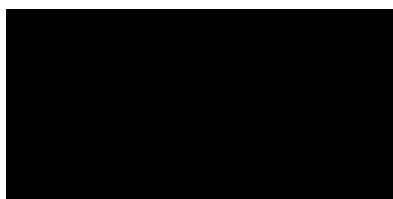
in the Faculty of Business and Management

**October 2022**

## Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other education institution in the United Kingdom or overseas.

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## Abstract

Based on the combined perspective of the transaction cost theory (TCT), the resource-based view (RBV) and the extended resource-based view (ERBV), this thesis presents an analysis of the influence of identified potential determinants of vertical integration on backward integration with suppliers through mergers and acquisitions (M&A). The objectives of the work are to identify and examine determinants that may have an impact on backward integration through M&A and to create a conceptual model that can be used to explain and examine the determinants of such integration through M&A.

Drawing on an extensive literature review, six hypotheses were derived. These test the relationship between the determinants of vertical integration, namely asset specificity, environmental uncertainty, transaction frequency, closeness of competences, the VRIN criteria of the supplier, and the VRIN criteria of the supplier's supplier base, and backward integration through M&A. An empirical, quantitative study was conducted in the form of a self-administered online questionnaire addressing the research aim of the thesis. This was sent to managers and decision-makers, who included procurement managers, supply chain managers, chief procurement officers, and supply chain-related consultants. The survey ultimately reached 445 potential respondents and 122 responses were received.

The statistics support the positive and significant impact of asset specificity and closeness between the buyer's competences and those required for a specific activity performed by a supplier. The study contributes to the literature by showing that together ERBV, RBV, and TCT contribute to research on the determinants of vertical integration. The constructs examined, particularly asset specificity and closeness of competence, are ones that predict the suitability of M&A with suppliers within the context of vertical integration. The results are also of relevance for practitioners, helping them to consider and appropriately assess such influencing factors when making decisions about company boundaries.

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First, I would like to express my gratitude to my supervisors, Prof. Neil Towers and Dr. Tamer Darwish of the University of Gloucestershire. I found every meeting with them to be very profitable and constructive. Whenever I strayed from the right path, they brought me back on track. I was able to ask questions in an undogmatic way at any time, which were always answered with the necessary seriousness and with new food for thought.

I would also like to thank those who took the time to complete my survey. I would especially like to thank my colleagues who participated in the first pilot phase and all the other volunteers who agreed to participate in the second pilot phase. Without their willingness, it would not have been possible to develop a survey that met my qualitative expectations.

Special thanks go to my family, who stood behind me unreservedly when I decided to undertake a PhD alongside a demanding job. I received full support at all times when I spent my free time at my desk and was not available for them. The same goes for my friends, who showed understanding whenever I was unable to join them for personal gatheringd. Instead of complaints, I experienced support and appreciation for what I was doing.

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## List of Tables

Table 1: Two views of SCM.....	84
Table 2: Key literature .....	87
Table 3: Key constructs of the thesis derived from the TCT.....	97
Table 4: Key constructs of the thesis derived from the RBV and ERBV.....	97
Table 5: Basic beliefs .....	120
Table 6: Relevant situations for different research methods.....	144
Table 7: Measures of the dependent construct.....	154
Table 8: Measures of the independent constructs.....	154
Table 9: Measures of the control variables.....	156
Table 10: Questionnaire modifications after conducting the pilot study.....	162
Table 11: Skewness and kurtosis values of normality.....	179
Table 12: Correlation matrix of constructs.....	180
Table 13: Correlation matrix of constructs.....	181
Table 14: Convergent validity .....	187
Table 15: Discriminant validity.....	189
Table 16: Responses and descriptive statistics for asset specificity of transactions.....	191
Table 17: Responses and descriptive statistics for environmental uncertainty.....	194
Table 18: Responses and descriptive statistics for transaction frequency .....	196
Table 19: Responses and descriptive statistics for closeness of competences.....	197
Table 20: Responses and descriptive statistics for VRIN criteria.....	199
Table 21: Responses and descriptive statistics for VRIN criteria supplier base.....	203
Table 22: Responses and descriptive statistics for vertical integration .....	205
Table 23: Model fit summary .....	208
Table 24: Hierarchical multi-regression analysis results.....	211

Table 25: Results of the research objectives, model testing and research hypotheses .....	216
Table 26: Overview of contributions to theory.....	249
Table 27: Overview of contributions to practice .....	255

## List of Figures

Figure 1: Number and value of M&A worldwide 1985 to 2021 .....	2
Figure 2: Research structure and framework .....	17
Figure 3: Types of channel relationships .....	21
Figure 4: Magnitude of crossing-over by M&A types .....	30
Figure 5: Simplified TCT: key constructs, transaction costs and governance modes .....	53
Figure 6: Continuum of asset-specific external contractual forms .....	56
Figure 7: Conceptual model of RBV .....	62
Figure 8: A resource-based approach to strategy analysis .....	72
Figure 9: General framework of the thesis .....	99
Figure 10: Conceptual framework of determinants of backward intergration through M&A114	
Figure 11: Processes of research approaches .....	136
Figure 12: Dominant deductive research approach .....	137
Figure 13: Epistemological integrity of the research .....	142
Figure 14: Procedure for developing a questionnaire .....	147
Figure 15: Types of questionnaires .....	149
Figure 16: Outliers of firm size and firm age .....	177
Figure 17: The final model .....	217

## **List of Abbreviations**

ASPT	Asset Specificity
AVE	Average Variance Extracted
CEO	Chief Executive Officer
CLM	Council of Logistics Management
CPO	Chief Procurement Officer
CPS	Closeness of Competences
EDI	Electronic Data Interchange
ENVU	Environmental Uncertainty
ERBV	Extended Resource-Based View
M&A	Mergers and Acquisitions
MBA	Master of Business Administration
RA	Research Aim
RBV	Resource-Based View
RO	Research Objective
RQ	Research Question
SCM	Supply Chain Management
SD	Standard Deviation
SCO	Supply Chain Orientation
SEM	Structural Equation Modelling
TCT	Transaction Cost Theory
TRAFR	Transaction Frequency
VI	Vertical Integration
VIF	Variation Inflation Factor



VRIN	Valuable, Rare, Imperfectly Imitable, Non-Substitutional
VRINSB	VRIN Criteria of Supplier Base

## Table of Contents

<b>Declaration</b> .....	<b>ii</b>
<b>Abstract</b> .....	<b>iii</b>
<b>Acknowledgments</b> .....	<b>iv</b>
<b>List of Tables</b> .....	<b>v</b>
<b>List of Figures</b> .....	<b>vii</b>
<b>List of Abbreviations</b> .....	<b>viii</b>
<b>1 Introduction</b> .....	<b>1</b>
1.1 Research Background and Motivation .....	2
1.2 Research Objectives and Questions .....	6
1.3 Research Contributions .....	8
1.4 Thesis Summary and Framework .....	14
<b>2 Literature Review</b> .....	<b>17</b>
2.1 Supply Chain Management .....	19
2.1.1 Supply Chain .....	19
2.1.2 Supply Chain Management (SCM) .....	22
2.2 Mergers and Acquisitions .....	29
2.2.1 Definition of Mergers and Acquisitions .....	30
2.2.2 Determinants of Mergers and Acquisitions .....	34
2.3 Transaction Cost Theory (TCT) .....	41
2.3.1 TCT and SCM .....	42
2.3.2 TCT and Boundary Decisions .....	54
2.4 Resource-Based View (RBV) .....	58
2.4.1 RBV and SCM .....	59
2.4.2 Extended Resource-Based View (ERBV) and SCM .....	66
2.4.3 RBV, ERBV and Boundary Decisions .....	69
2.5 RBV, ERBV and TCT: Criticism and Relationship .....	77
2.5.1 Criticism of TCT .....	77
2.5.2 Criticism of (E)RBV .....	80
2.5.3 Relationship between (E)RBV and TCT .....	83
2.6 Key Literature Overview .....	87
2.7 Summary .....	90

<b>3</b>	<b>Hypothesis Development.....</b>	<b>96</b>
3.1	Overview of Constructs.....	96
3.2	Hypotheses.....	100
3.3	Conceptual Framework.....	113
3.4	Summary.....	115
<b>4</b>	<b>Research Philosophy .....</b>	<b>117</b>
4.1.1	Ontology.....	117
4.1.2	Epistemology.....	118
4.2	Research Paradigms.....	119
4.2.1	Positivism.....	121
4.2.2	Postpositivism.....	124
4.2.3	Critical Theory.....	125
4.2.4	Constructivism.....	126
4.3	Research Methodology.....	127
4.3.1	Quantitative Research Methods.....	129
4.3.2	Qualitative Research Methods.....	130
4.3.3	Mixed Methods.....	131
4.3.4	Methodology Employed in Supply Chain Studies.....	132
4.4	Research Design.....	133
4.4.1	Research Purpose.....	134
4.4.2	Research Approach.....	136
4.4.3	Time Horizon.....	141
4.5	Rationale for the Chosen Paradigm, Methodology and Research Design.....	142
4.6	Questionnaire Design.....	146
4.6.1	Construction of the Questionnaire.....	147
4.6.2	Information Sought and Method of Administration.....	148
4.6.3	Constructs and Measures.....	150
4.6.4	Form, Wording and Sequence of Questions.....	156
4.6.5	Translation of the Questionnaire from English to German.....	158
4.6.6	Physical Characteristics and Pretesting.....	159
4.7	Sampling Design.....	163
4.7.1	Defining the Population.....	163
4.7.2	Sample Frame.....	164
4.7.3	Sampling Procedure.....	165
4.7.4	Determining the Sample Size.....	166
4.8	Summary.....	167

<b>5</b>	<b>Data Analysis .....</b>	<b>170</b>
5.1	Questionnaire Response Rate.....	171
5.2	Data Preparation.....	172
5.2.1	Missing Data.....	172
5.2.2	Outliers .....	174
5.2.3	Normality.....	177
5.2.4	Linearity.....	179
5.3	Reliability and Validity of the Research Constructs .....	181
5.3.1	Validity of the Research Constructs .....	183
5.3.2	Content Validity .....	183
5.3.3	Construct Validity - Convergent and Discriminant .....	184
5.4	Descriptive Analysis of the Research Constructs.....	189
5.4.1	Asset Specificity .....	190
5.4.2	Environmental Uncertainty.....	193
5.4.3	Transaction Frequency.....	195
5.4.4	Closeness of Competences .....	197
5.4.5	VRIN Criteria .....	198
5.4.6	VRIN Criteria SB .....	203
5.4.7	Vertical Integration .....	204
5.5	Model Testing and Research Hypotheses .....	206
5.5.1	Model Summary .....	206
5.5.2	Research Hypothesis Testing.....	210
5.5.3	Results of Testing the Effect of the Determinants of Vertical Integration on Backward Integration through M&A .....	211
5.6	Summary.....	214
<b>6</b>	<b>Discussion of the Research Findings .....</b>	<b>218</b>
6.1	H1 The higher the degree of asset specificity within the relationship between buyer and supplier, the greater the likelihood of using backward integration through M&A.....	218
6.2	H2 The greater the environmental uncertainty, the greater the likelihood of using vertical integration through M&A along the supply chain. ....	220
6.3	H3 The higher the frequency of transactions between a firm and its supplier, the higher the likelihood of backward integration through M&A along the supply chain. ....	225
6.4	H4 The higher the degree of closeness between the buyer's present competences and the competences required for a specific activity performed by a supplier, the higher the likelihood of backward integration through M&A.....	229
6.5	H5 The closer the resources acquired from a supplier are to the VRIN criteria, the higher the likelihood of vertically integrating the supplier through M&A.....	230
6.6	H6 The larger a supplier's supplier base possesses VRIN resources, the more likely it is that the buyer will merge with or acquire the supplier.....	233
6.7	Summary.....	235

<b>7</b>	<b>Research Conclusions.....</b>	<b>237</b>
7.1	Implications and Contributions to Theory .....	238
7.2	Implications and Contributions to Practice .....	250
7.3	Research Limitations.....	256
7.4	Future Directions.....	260
7.5	Summary.....	264
	<b>Bibliography.....</b>	<b>267</b>
	<b>Appendix A – English Version of the Questionnaire .....</b>	<b>315</b>
	<b>Appendix B – German Version of the Questionnaire .....</b>	<b>321</b>

# 1 Introduction

The identification of factors influencing vertical integration and their impact on whether mergers with, or acquisitions of, suppliers should be undertaken has not been widely reported. This research aims to gain an understanding of potential determinants of vertical integration and their impact on backward integration through M&A with suppliers. The influence of the determinants of backward integration through M&A is investigated from both transaction cost and resource-based perspectives, with the aim of making a significant contribution to theory and practice.

The determinants examined are based on the constructs of the asset specificity of transactions within a supply chain; the environmental uncertainty of inter-company transactions; the frequency of transactions; the competencies of the firms involved; and the resources of the parties in the supply chain. The study tests a number of hypotheses to evaluate the relationships between the determining factors and M&A and to develop a suggested conceptual framework to show the link between the constructs and backward integration through M&A.

In the literature, there are no studies that examine the connection between such determinants from the supply chain perspective, and that of backward integration through mergers and acquisitions. The study addresses this neglected area, and it is expected that the results will be of benefit to firms facing the question of backward integration through M&A in respect of a supplier up the supply chain.

The introduction to the work presents different aspects of the research background. The chapter also sheds light on the objectives and research questions related to the determinants of backward integration through mergers and acquisitions from the supply chain perspective. In addition, the methodology is presented, followed by the structure of the thesis.

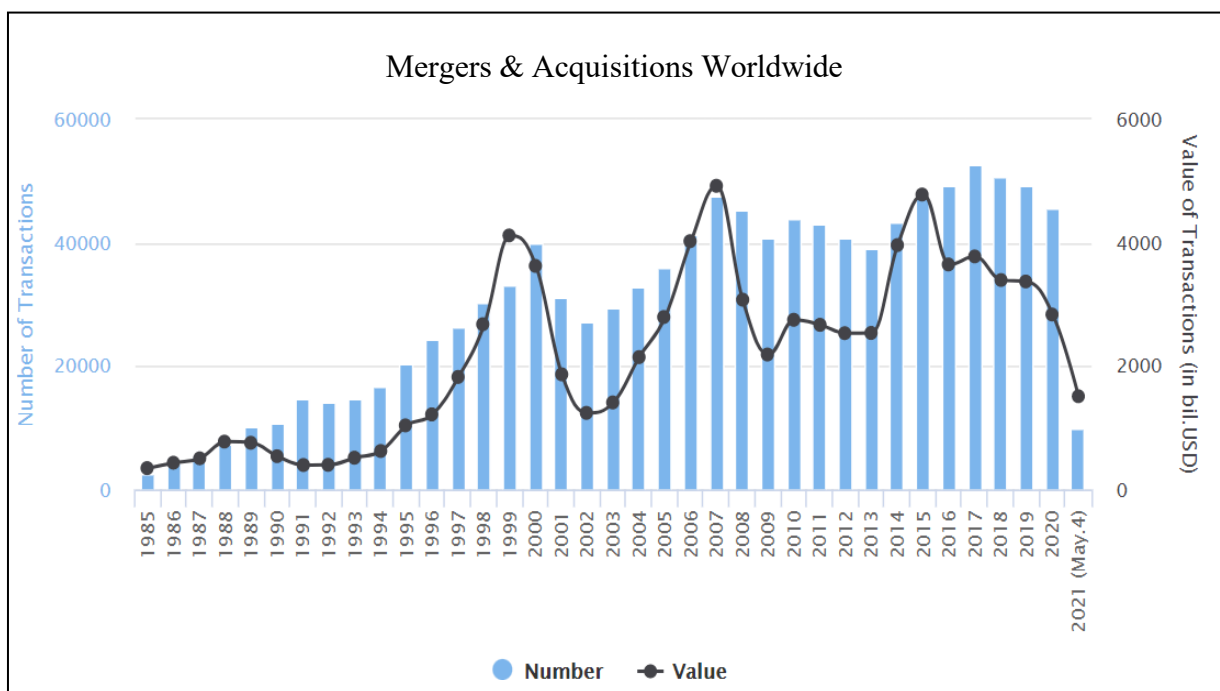
## 1.1 Research Background and Motivation

The idea and motivation for the work are based on the author's personal experience with intensive mergers and acquisitions in the work environment, as well as the lack of focus on the supply chain perspective in this context and the apparent lack of relevant literature in the area.

Isolated processes with a lack of integration between M&A-related departments, especially with regard to supply chain management, seem to carry the risk of insufficiently informed decision-making on whether or not to conduct mergers or acquisitions.

The fact that since 2000 more than 790,000 M&A transactions have taken place worldwide, with a value of over 57 trillion USD (Institute for Mergers, Acquisitions and Alliances, 2021), has also been an impetus for writing the thesis.

Figure 1: Number and value of M&A worldwide 1985 to 2021 (source: Institute for Mergers, Acquisitions and Alliances, 2021)



As can be seen from the previous illustration, although mergers and acquisitions have declined since 2018 (the number of deals has fallen by 8% to around 49,000, while their value has increased by 4% to 3.8 trillion USD), Richard Wilkey, Partner, Head of Corporate in London, commented on the trends of M&A in 2020 at the Business Leaders' Mergers and Acquisitions Roundtable:

Deal activity is definitely on the rise, which is pleasing, as this is against a backdrop of the lowest half yearly total deal values since 2013. Activity is being driven by a number of factors including low interest rates, the levels of corporate cash available, and private capital – it's being reported that there's approximately \$1.5 trillion globally available in private equity funds for acquisition and investment (dry powder). And of course there will be increasing opportunities to invest in distressed businesses” (HCR, 2020).

Supply chain management includes organisational boundaries, such as supplier integration, which is the starting point for effective supply management functions (Axelsson, Rozemeijer, & Wynstra, 2005; Wynstra, Suurmond, & Nullmeier, 2019). Firms must be proactive in defining and redefining their strategic core on a continuous basis (Cox, 1996). Therefore, knowing and understanding the determinants that influence these boundary decisions play a decisive role from a supply chain perspective for purchasing and supply chain managers and those involved in a firm's boundary decisions.

It is not a new phenomenon that senior managers have to make important decisions when it comes to determining firm boundaries; that is, which business activities should become part of the firm and which should be outsourced (Barney, 1999). Executives therefore need a sound basis for their decision-making. This study aims to contribute to this specific area by



providing management implications that help to focus on those influencing factors that have a positive impact on the execution of backward integration with suppliers.

If companies integrate the wrong business activities into their corporate boundaries, they may lose their strategic focus and risk compromising their competitive advantage (Barney, 1999). A well-developed approach to determining the boundaries of a company can be seen in transaction cost theory (Barney, 1999). This specifies the circumstances in which a firm should choose a certain form of economic exchange; that is, when a transaction should be made inside the firm, and when it should be made outside it (Williamson, 1985). Much of the evidence derived from this theory has received empirical support from various scholars (de Souza Filho & Miranda, 2019; Rindfleisch & Heide, 1997, Yu, Li, & Ouyang, 2021).

The transaction cost-oriented view alone does not seem to be a sufficient approach to identifying the determinants that influence the definition of corporate boundaries. Practising managers asked themselves whether other factors, such as resources and capabilities, might not also play a role in such a management decision (Barney, 1999). Therefore, the following questions are of central importance and inform the discussion: “What role do firm capabilities play in this approach to firm boundaries?” and “Isn’t the reason we make boundary choices simply an effort to discover the best way to gain access to the capabilities we need to be successful?” (Barney, 1999, p.138). The resource-based view deals with these very questions in order to provide answers to the determination of boundary decisions (Barney, 1999). Based on this notion that boundary decisions are made to gain access to resources and capabilities, this thesis identifies determinants from RBV theory and TCT, and analyses the impact of the underlying constructs on backward integration through M&A.

There are many different determinants and motives that might lead to the execution of M&A, such as exploiting synergies (Alexandridis, Petmezas, & Travlos, 2010) by combining the assets of two firms in order to increase the total value of the company (Dhir & Mital, 2012), or by increasing revenues while simultaneously reducing costs (Gaughan, 2010).

In line with the approaches to decision-making across firm boundaries, cost-relevant aspects such as cost reductions (Gaughan, 2010), for example, transaction costs, as well as the combination of resources (Clougherty & Duso, 2011) are relevant determinants in relation to the implementation of synergies through M&A. It is therefore important to understand when, and under which conditions, costs, including transaction costs, can be reduced through vertical integration (Argyres & Zenger, 2012), such as backward integration through M&A. The motives thus range from cost efficiency gains through vertical integration (Chemla, 2003) to transaction cost-related explanations (Dyer, Kale, & Singh 2004; Harzing, 2002; Hong-tao, 2020, Kale, Singh, & Raman, 2009) and resource-related approaches (Deng, 2009; Ferreira, Santos, Almeida, & Reis, 2014; Steiner, Lan, Unterschultz, & Boxall, 2017) in an attempt to explain the determinants of M&A.

Nevertheless, there do not seem to be any determinants relevant to M&A that have also been examined from a supply chain perspective. There is an apparent gap in the literature, as the theories of TCT and RBV are present in the M&A context, but are not considered from the supply chain perspective; that is, the determinants which play a role in M&A up the supply chain with a supplier have apparently not been investigated.

Therefore, the main purpose of this research is to contribute to understanding of the determinants that induce firms to perform backward integration through M&A. The determinants will be investigated by deriving variables from the transaction cost theory (TCT) and the resource-based view of the firm (RBV), together with the extended resource-based view of the firm (ERBV). Therefore, the research seeks to explain which determinants cause firms to expand their boundaries through M&A up the supply chain. Managerial implications and the impact of the research will be seen from the study results, as these will help players in the supply chain to understand under which circumstances the governance mode of hierarchy may be best 'fit for purpose'.

## 1.2 Research Objectives and Questions

The research aim (RA) of the thesis is to gain understanding of potential determinants of vertical integration and to investigate their effects on backward integration through M&A with suppliers from the supply chain perspective.

In the literature, various determinants that play a role in the implementation of M&A, such as transaction costs, have been examined (Ferreira et al., 2014). However, the focus has not been on explaining the motives or determinants of M&A as such, but on investigating different types of market entry (Dyer et al., 2004; Harzing, 2002; Hennart & Park, 1993; Kale, Singh, & Raman, 2009) or performance-related investigations (e.g., Hong-tao, 2020; Popli, Ladkani, & Gaur, 2017). According to the literature review, the extent to which transaction costs have an influence on backward integration through M&A has not been investigated. Many studies deal with vertical integration and boundary decisions (e.g., Argyres, Felin, Foss, & Zenger, 2012; Foerstl, Kirchoff, & Bals, 2016; David & Han, 2004; Escuer, Olmos, & Martinez, 2013; Gulbrandsen, Lambe, & Sandvik, 2017; Vannoni, 2002) and examine hypotheses concerning constructs such as asset specificity, uncertainty and transaction frequency (e.g., Lieberman, 1991; Escuer et al., 2013; Yu, Li, & Ouyang, 2021). However, none of these studies deals with the impact of these determinants on M&A in terms of backward integration along the supply chain.

Resource-oriented studies (e.g., Child & Rodrigues, 2005; Luo & Tung, 2007; Popli et al., 2017) on M&A provide starting points for resource-related motives based on the idea of acquiring strategic assets or expanding the market in order to improve critical capabilities and learn skills and expand resources that are not available in the factor market (Barney, 1986; Ferreira & Tallman, 2007; Mazon, Moreira-da-Silva, & Serra, 2017). Some studies have examined vertical integration based on the resource-oriented view of the firm (Steiner et al., 2017; Wang & Zajac, 2007) and suggest that similarity of resources and capabilities is a

contributing factor to vertical integration (e.g., Gulbrandsen et al., 2009). However, according to the literature review, no studies explicitly focus on M&A with suppliers up the supply chain.

In order to complete these gaps, this study develops a general and conceptual framework that considers the determinants that influence backward integration through M&A along the supply chain, such as asset specificity, uncertainty, frequency of transactions and firm resources. The results of the research will be derived from a deductive perspective in order to obtain detailed understanding of their relationships. According to the research aim of identifying from a supply chain perspective relevant determinants of vertical integration which have an impact on whether or not M&A are undertaken, and based on the gaps in the literature to be filled, the following research question (RQ) needs to be answered:

- RQ: What determinants impact vertical integration through mergers and acquisitions with suppliers from a supply chain perspective?

In order to answer this question, the following research objectives (ROs) need to be achieved:

- RO1: To conduct an in-depth literature review in order to identify determinants that may have an impact on backward integration through M&A.
- RO2: To analyse how transaction cost- and resource-related determinants influence the implementation of backward integration through M&A.
- RO3: To propose a conceptual model that can be applied to explain determinants of the implementation of backward integration through M&A.

In order to achieve these objectives, the determinants are identified as key concepts in Chapter 3, based on the literature review in Chapter 2. The five constructs are asset specificity, the core competences of the firm, uncertainty within transactions, transaction frequency and firm resources. The relationship between these constructs and the implementation of backward

integration through M&A are explored as seven hypotheses in Chapter 3 and their impact is analysed in Chapter 5. The methodology and methods (see in-depth discussion in Chapters 4 and 5) used to test the hypotheses and the philosophical perspective on which this study is based are briefly outlined in the following section.

### 1.3 Research Contributions

This study aims to contribute to the literature on vertical integration from the perspective of different, complementary theories, in particular to examine the motives and determinants for M&A with suppliers, which could be beneficial for vertical backward integration. In this context, the thesis also seeks to support management and economic theories, such as the resource-based view (Barney, 1991; Steiner et al., 2017), the extended resource-based view (Cao & Zhang, 2011; Yang, Jia, & Xu, 2019) and transaction cost theory (Williamson, 1985; Rindfleisch, 2020). Existing constructs are used adaptively to answer new questions, namely what the determinants that might be beneficial for vertical integration through M&A from a supply chain perspective are, and how they correlate with backward integration through M&A.

In the literature, vertical integrations have been investigated, but usually the focus has been less on M&A, but rather on the integration of specific activities (Rindfleisch, 2020; Rindfleisch & Heide, 1997). Even though some authors (e.g., Hobbs, 1996; Cox, 1996) have used transaction theory to develop a theoretical model, no empirical studies support their authors' assumptions holistically. Although M&A studies have also dealt with possible determinants that can lead to M&A (Carney, 2010; Eun & Resnick, 2010; Hassan & Mayrhofer, 2018; Gaughan, 2010), explicit determinants for the backward integration of suppliers have not been addressed or empirically investigated.

This study examines the extent to which certain factors derived from these theories can have a positive impact on backward integration through M&A from the resource-driven

perspective, the extended resource-driven perspective, and the transaction-cost-driven perspective. In doing so, a conceptual framework is designed which also has managerial implications, as the results will help supply chain managers to better understand the circumstances under which it may be appropriate to expand their business boundaries towards suppliers through the implementation of M&A. In particular, the following contributions are made.

### **Contributions to theory**

#### **Multiple theory approach**

The study is original in that it uses three theories, namely TCT, RVB and ERVB, to derive hypotheses and in doing so highlights the overlap of resources and asset specificity, two constructs that stem from two different theoretical strands. While a growing body of research has applied the integrated framework of TCT and RBV to examine outsourcing decisions in particular (McIvor, 2009; Neves et al., 2014; Watjatrakul, 2005), no work has yet integrated TCT, RBV and ERBV to examine the determinants of vertical integration (through M&A).

#### **TCT constructs measuring M&A with suppliers**

The work is also the first to use the constructs of asset specificity, environmental uncertainty and transaction frequency to examine backward integration with suppliers through mergers and acquisitions. Previous studies have used TCT in principle to analyse vertical integration, e.g. of products or services, but not in this explicit context of backward integration of suppliers. This study therefore contributes to the research field of TCT and boundary decisions by extending it to include the supply chain perspective and providing a theoretical framework for further investigation in this research area.

## **The limited predictability of TCT for backward integration**

This study only partially confirms that transaction costs can predict which form of governance is beneficial from a cost-benefit perspective (Williamson, 1991; Zylbersztajn, 2018), as a positive and significant relationship was only found between asset specificity and backward integration through M&A. This finding is a contribution to theory, as the predictability of governance forms based on transaction costs is not fully demonstrated according to this study, at least not in relation to the integration of suppliers.

## **Asset specificity predicting M&A with suppliers**

High asset specificity has a positive impact on backward integration, so the novelty of this study is that it not only contributes to the notion that asset specificity is a construct that affects the way governance is conducted (e.g. de Souza Filho & Miranda, 2019; Joskow, Shelanski & Klein, 1995), but also that it is the first to demonstrate the relationship between asset specificity and backward integration of a firm's suppliers through M&A. This finding therefore not only supports current research approaches in general, but also contributes to the literature by in particular explicitly expanding the field of research.

## **RBV constructs measuring M&A with suppliers**

The study contributes to RBV theory by deriving the determinants of vertical integration from RBV to investigate the determinants' influence on backward integration with suppliers. A new theoretical framework is developed with 19 variables derived from the RBV literature and the study contributes to the creation of new knowledge by examining the backward integration of the supplier as a stand-alone firm and not simply the specific resources of that firm.

### **Closeness of competences predicting M&A with suppliers**

The positive correlation between proximity and competencies contributes to RBV theory by proving that RBV can make predictions about boundaries, and it also contributes to empirical support for the theory's proposition that firms tend to expand their boundaries to areas where their existing comparable competencies can be leveraged to create a competitive advantage (Gulbrandsen, Sandvik, & Haugland, 2009; Richardson, 1972; Winter, 1988).

### **Connection between RBV and TCT to measure M&A with suppliers**

The study reveals and substantiates the links between RBV and TCT, especially by examining high asset-specific investments, which are also considered firm-specific resources. New empirical evidence contributes to the propositions in the literature that the closer the supplier is to the firm's core competencies (which also equates to asset specificity), the more likely a firm is to engage in M&A.

### **The VRIN criteria as a construct for measuring M&A with suppliers**

This work is the first to examine the influence of resources with VRIN criteria (valuable, rare, inimitable, non-substitutable) on backward integration within the supply chain. Although no significant relationship between the construct and backward integration with suppliers could be verified, the study contributes to the literature and at the same time fills a research gap by embedding the created construct in a theoretical framework, thus giving researchers the opportunity to test the theory in more detail in the future.



## **The ERBV construct for measuring M&A with suppliers**

Another distinctive and novel aspect is that the work uses ERBV theory to consider the VRIN criteria of the suppliers of the potential supplier to be acquired by deriving a construct with corresponding variables from RBV research. Although the impact of this construct on backward integration through mergers and acquisitions is not significant, the study represents a contribution to future research and literature as an approach to ERBV research in relation to firms' boundary decisions.

## **Contributions to practice**

### **Focus Assessment of RBV and TCT metrics for M&A with suppliers**

The study contributes to the understanding that managers and decision-makers should focus on the determinants of vertical integration when considering backward integration through M&A in the supply chain. To this end, they should establish an assessment that is able to evaluate the determinants. The findings of this study will help managers and decision-makers to better understand the role of the various determinants of backward integration, and consequently they should consider an assessment that is able to evaluate these determinants.

### **Assessment of asset specificity between the firm and its suppliers**

Supply chain managers need to pay more attention to the supplier-buyer relationship, and the following factors should be assessed in order to make decisions about backward integration of suppliers: specific skills required in the buyer-supplier relationship to manage the relationship; specific knowledge required to understand the supplier's work processes; the time required to acquire specific knowledge of the supplier's technical or service standards; and

whether specific resources are required to train the supplier's personnel or to adapt to the supplier's procedures.

### **Environmental uncertainty should not be overstated in M&A with suppliers**

Although TCT theory would suggest this, according to this study decision-makers and managers should give less weight to environmental uncertainty when evaluating backward integration with suppliers through M&A. For example, the availability of alternative suppliers, the complexity of the market or the stability of market supply play a somewhat subordinate role and should not be used as decisive factors in decision-making.

### **Transaction frequency should not be misinterpreted in M&A with suppliers**

The same argument as that related to environmental uncertainty applies to transaction frequency. While TCT might imply this, according to this work supply chain managers and decision-makers should not consider procurement transaction frequency or order frequency relative to other suppliers as criteria when deciding on potential mergers or acquisitions with their suppliers.

### **Assessment of competencies between the firm itself and its supplier**

This work also contributes to the understanding that managers should examine their own competencies and those of the supplier, because if they are very similar this would support decisions in favour of expanding the boundaries of a company from a supply chain perspective. Managers need to make an assessment of the competences behind products or services in order

to compare them with their own and on this basis be able to make a decision when it comes to backward integration with suppliers.

### **VRIN criteria should not be determined in practice**

According to this study, the characteristic features of supplier resources, such as value, rarity, inimitability, and non-substitutability (i.e., the VRIN criteria), do not prove to be determinants of mergers or acquisitions with suppliers and thus, unlike the similarity to specific resources, they are not necessary for evaluation in the context of decisions for or against backward integration.

In the following section, the framework of the thesis is presented in the form of a summary, followed by Chapter 2, the literature review.

#### **1.4 Thesis Summary and Framework**

The thesis is divided into seven chapters, as summarised in the overview of the framework of the work in Figure 1.

Chapter 1 deals with the research background and the author's motivation to undertake this study. In addition, the research objectives are briefly introduced, and the methodology is explained, which is essentially the way the thesis research problem is examined.

Chapter 2 examines the literature with regard to a definition of the supply chain that is relevant to the thesis and scrutinises the relevance of supply chain management, with the extended supply chain being the main focus of the supply chain perspective in this study. In addition, the different forms of M&A are discussed, together with the different motivations to undertake M&A, with both cost-related and competitive advantage-oriented motivations playing an important role in the study. The theories of views on firms and their approaches to

explain boundary decisions are examined, namely the transaction cost theory (TCT), the resource-based view of the firm (RBV) and the extended resource-based view of the firm (ERBV). The relevance of each theory with regard to M&A, that is, the boundary decisions of a firm and the supply chain perspective, is discussed.

This is then further summarised and contextualised in the course of the hypothesis development in Chapter 3. In this chapter, the constructs of the theories are emphasised and, in addition to the brief definition of each construct, the relevance of the supply chain and M&A are explained. Based on this, a general framework is presented, consisting of the following components: theories, constructs, M&A and the supply chain. These interrelations form the basis for the subsequent development of the seven hypotheses in order to finally elaborate the conceptual framework for the study.

Chapter 4 deals with the research design and methodology. Predominant research philosophies are presented, different methodological approaches are discussed, and the research purpose, the research approach, and the appropriate time horizon for this study are outlined. Regarding the basic philosophical position, the study is situated in positivism, which supports the use of quantitative methods; for example, a survey in the form of a questionnaire. The questionnaire design is then developed and the method of administration, constructs and measures, and the form, wording and sequence of questions are discussed. This is followed by the sampling design, including the definition of the population, the sample frame and procedure, and the determination of the sample size.

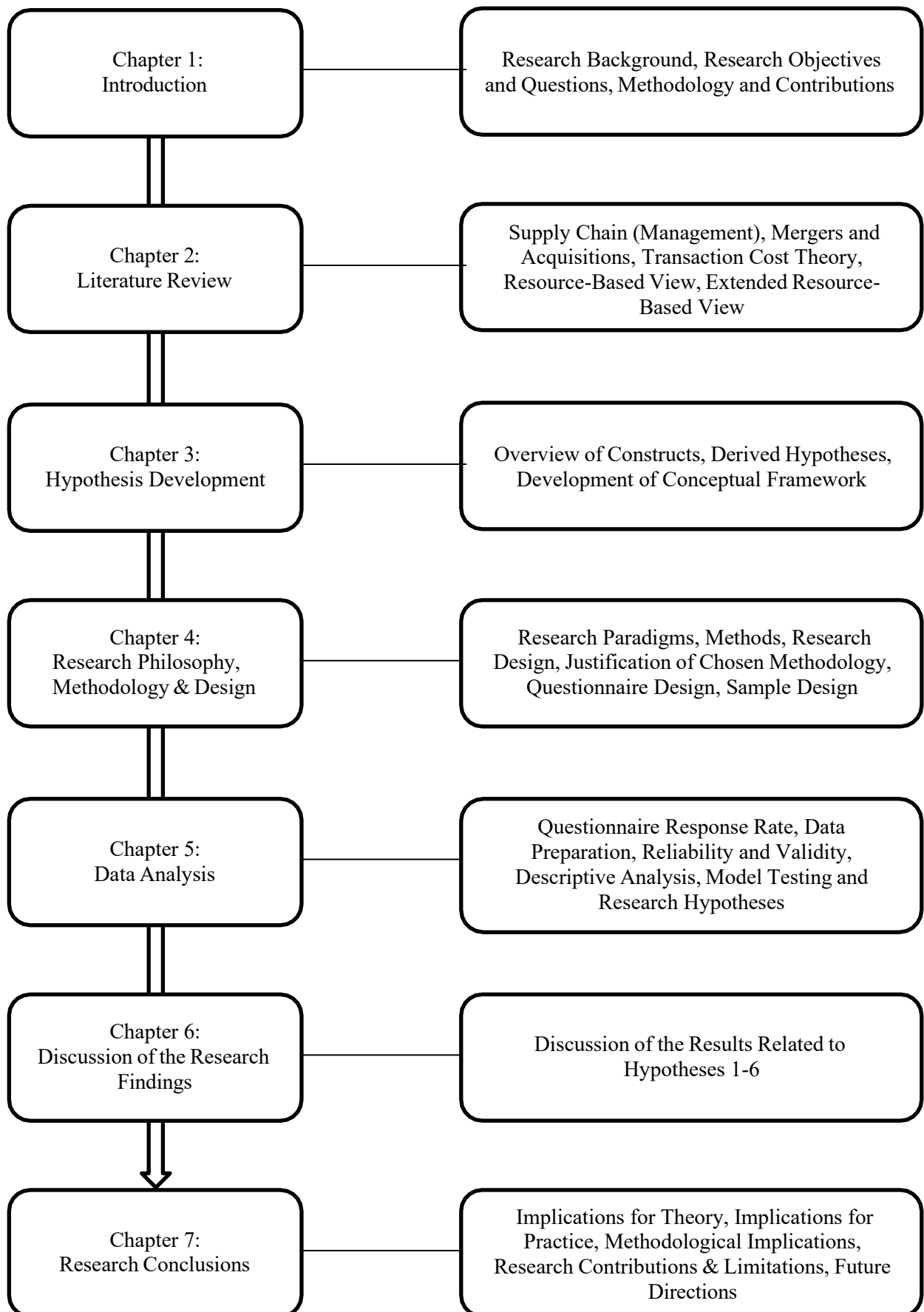
Chapter 5 discusses the data analysis and conducts appropriate statistical tests, which are conducted using SPSS software. In the first step, important tests are performed to prepare the data, followed by further analyses. Therefore, in addition to deriving the response rate, this chapter includes discussion of the tests for missing data, outliers, normality and linearity. In the next step, reliability and validity tests are performed; the validity tests are divided into construct and content validity (in the form of convergent and discriminant validity). This is taken as the

basis to examine how the responding experts and decision-makers from the field of supply chain management answered the survey questions and how these are reflected in the seven constructs of the research model. The descriptive analysis is examined using the mean, standard deviation (SD) and frequencies of the corresponding items of the questionnaire, also referred to as measures. Finally, the model is tested and the statistical results of the hypotheses are discussed. Hierarchical multiple regression analysis is used, which is considered the most appropriate method for testing the relationships between the dependent and independent variables, taking into account the control variables of firm age and firm size.

Chapter 6 discusses the research findings, with the main objective of presenting the results in the context of the underlying theories, exploring the effects of the identified determinants that may have a negative or positive influence on vertical integration; that is, backward integration through M&A. The discussion of the results is conducted in the context of the hypotheses developed in Chapter 3, which stem from the theories of TCT, RBV and ERV.

Finally, Chapter 7 presents the research conclusions in terms of implications for theory and practice, research contributions and limitations, together with future research directions. This includes a discussion of the use of the different theories, as well as the results of the impact of the different dependent variables on backward integration through M&A with regard to the implications for the three theories. Furthermore, the impacts for supply chain managers and decision-makers, derived from the results of the analyses, are demonstrated and discussed. In addition, the research contributions are discussed in light of the combination of the two streams of theory, and the contributions are highlighted with respect to the identified research gaps. Altogether, eight research contributions are presented and discussed. Figure 2 summarises the overall framework of the thesis.

Figure 2: Research structure and framework (source: author)



## 2 Literature Review

The aim of the literature review is to provide the thesis with a historical and theoretical perspective on the field of research and to present independent research knowledge in depth (Metzer & Kahn, 1995). A theoretical perspective can in turn be understood as an appropriate mix and combination of relevant theories that determine the research endeavour (Collis & Hussey 2013). This literature review will provide in-depth knowledge by linking vertical integration in the form of mergers and acquisitions (M&A) with the transaction cost theory (TCT) and the resource-based view of the firm (RBV), taking relevant supply chain aspects into account. In addition, it will provide a basis for the development of the hypotheses later in the work.

The chapter begins with an explanation of the terminology used and a definition of the supply chain and supply chain management. An explanation of different types of mergers and acquisitions is then provided, and the possible reasons for M&A are evaluated and will be discussed at the end of the chapter and placed in the theoretical context of the TCT and the RBV.

Both RBV and the TCT are initially explained in detail. In addition, an extension of RBV, the extended resource-based view of the firm (ERBV), is introduced. The theories will then be assessed in terms of the extent of their use and the contexts in which they appear in the literature in order to explain vertical integration and supply chain management (SCM) and which theoretical constructs have been at the centre of the studies examined.

Finally, critical aspects of the theories are acknowledged in order to understand their limitations and take into account their restrictions. In addition, the interrelations between the theories will be evaluated to determine whether the use of these theoretical strands can inform mitigating the restrictions of the other.

At the end of the chapter, the relevant implications for the thesis are presented and the important findings summarised, which will provide guidance for further investigation of the determinants of vertical integration through mergers and acquisitions from a supply chain perspective.

## 2.1 Supply Chain Management

Supply chain management has become a strategic management task (Bechtel & Jayaram, 1997; Choon Tan, Lyman & Wisner, 2002; LeMay, Helms, Kimball, & McMahon, 2017). In the context of this study, it is important to elaborate on the various characterisations of supply chain management and to establish a definition of it. Therefore, the first step is to define the term ‘supply chain’. Second, different perspectives from the literature on supply chain management are presented.

### 2.1.1 Supply Chain

The purpose of a supply chain can be understood as meeting customer requirements while creating value and realising profits (Chopra & Meindl, 2010; Ebrahimi, 2018). “The goal of supply chain management is to realize the coordination of activities across the supply chain, create value for customers, and increase the profitability of every link in the chain” (Hitt, Xu, & Carnes, 2016). A supply chain can be defined as a virtual network of organisations that are involved in different processes and activities through upstream and downstream links, which ultimately generate added value for the consumer of products and services (Christopher, 1992, 2016). Chopra and Meindl (2010) point out that the flow of products from suppliers to manufacturers, and then to distributors and ultimately to customers, is only part of the supply chain. A supply chain controls not only products and services but also information flows, flows



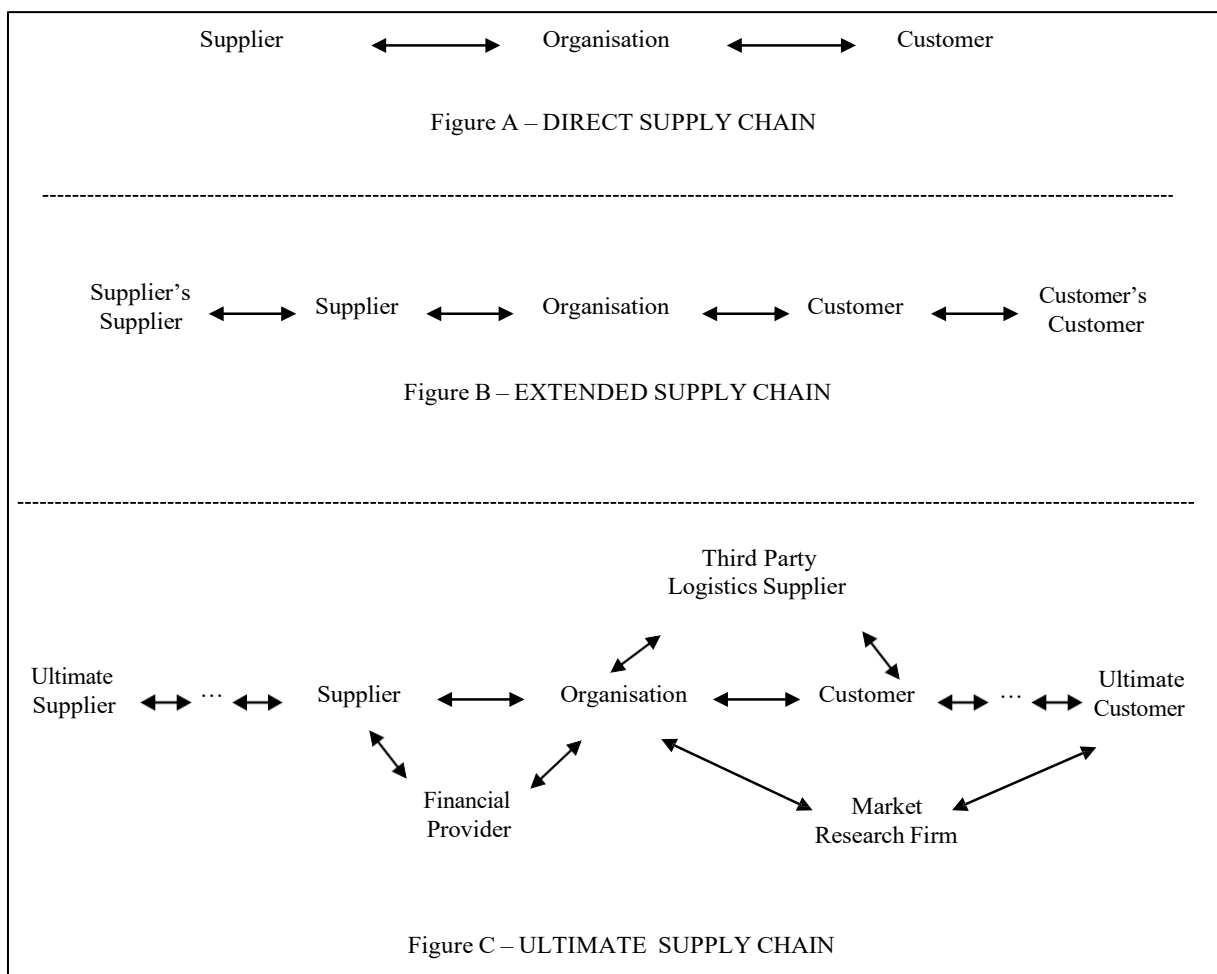
of funds and relationships between firms. Moreover, a supply chain is a network of the firms and parties involved in these flows (Chopra & Meindl, 2010; Bozarth, Warsing, Flynn, & Flynn, 2009; LeMay et al., 2017). Within supply chains, companies have to decide whether they want to cooperate with upstream (or downstream) partners and to what extent they want to cooperate with them (Giannakis & Louis, 2011; Teller, Kotzab, Grant, & Holweg, 2016). In the same manner, Mentzer et al. (2001, p. 4) define a supply chain as “a set of three or more entities (organisations or individuals) directly involved in the upstream and downstream flows of products, services, finances and/or information from a source to a customer”.

While many scholars emphasise the network of organisations (or in other words the relationship between companies) (e.g. Cooper & Ellram, 1993; La Londe & Masters, 1994; Lambert, LeMay et al., 2017, Stock, & Ellram, 1998; Teller et al., 2016), others define a supply chain as the concerted alignment of independent companies to distribute materials (La Londe & Masters, 1994, LeMay et al., 2017, Stock & Boyer, 2009) and to bring products or services to the market (Lambert, Stock, & Ellram, 1998). This work focuses on the governance mode in the buyer-supplier relationship; that is, the coordinated cooperation of independent companies.

A supply chain can range from the raw material phase to the final product stage, which can lead to very different types of networks and can be very difficult to organise and manage (Dudek, 2009). Both the business context and the manageability of the network determine the appropriate level of detail of the supply chain to be considered (Dudek, 2009). Against the background of the above definition, Mentzer et al. (2001) distinguish three different types of supply chain: the ‘direct supply chain’, ‘extended supply chain’ and ‘ultimate supply chain’ (see *Figure 3*; Mentzer et al., 2001, p. 5), which will now be discussed. The direct supply chain can be an integral part of the extended supply chain, which can, in turn, be part of the ultimate supply chain. The explanation of these typologies is intended on the one hand to provide an overview of the possible complexity of supply chains and on the other to determine which supply chain type should be applied in this thesis (see *Figure 3*).

A direct supply chain consists of a company, a supplier, and a customer involved in the upstream and/or downstream flows of products, services, finances, and/or information ... An extended supply chain includes suppliers of the immediate supplier and customers of the immediate customer, all involved in the upstream and/or downstream flows of products, services, finances, and/or information ... An ultimate supply chain includes all the organizations involved in all the upstream and downstream flows of products, services, finances, and information from the ultimate supplier to the ultimate customer (Mentzer et al., 2001, p. 4).

Figure 3: Types of channel relationships (Source: Mentzer, 2001, p. 5)



Against the background of the analysis of backward integration and its determinants from the supply chain perspective, the term ‘supply chain’ is understood in the sense of ‘extended supply chain’ in this thesis, with the focus on the upstream parties (the suppliers) who could potentially be integrated through M&A. Consideration of the ‘direct supply chain’ only would limit the possibility of considering correlations at several supply levels in the further discussion. This is because this work identifies and examines not only determinants of vertical integration that are related to the supplier, but also to the supplier base of the potential M&A target. The ‘ultimate supply chain’, on the other hand, contains further complexities are not examined in this thesis with regard to backward integration.

This leads the discussion to the development of the discipline of supply chain management (SCM), which is discussed in the following section, while defining the understanding of SCM terminology that applies to the work.

### 2.1.2 Supply Chain Management (SCM)

Supply chain management (SCM) has established itself as an important business discipline in recent decades (Christopher, 2016). It requires internal cross-functional integration within the company and integration with suppliers and customers outside it to be successful (Kannan & Tan, 2010); this thesis focuses on integration with the firm's suppliers.

There has been a call for more in-depth study of theory in supply chain research in the last 10 years and researchers have responded to this (Swanson, Goel, Francisco, & Stock, 2018). The most important subjects in the application of theoretical research in SCM appear to be relationships and collaboration, purchasing and procurement management, and strategy (Swanson, Goel, Francisco, & Stock, 2018). In the context of supply chain collaboration, both cost reduction and value creation are factors in improving the competitive advantage of the supply chain (Kotzab, Teller, Grant, & Friis, 2015), with various degrees of relationships to be

managed within it (Corbett, Blackburn, & van Wassenhove, 1999; Kotzab et al., 2015). For this thesis, the focus is particularly on forms of cooperation with the company's suppliers, as the aim is to gain understanding of the determinants of vertical integration and their impact on backward integration through mergers and acquisitions with the firm's suppliers.

Nevertheless, there seems to be little consent on the conceptual basis and definition of SCM (Chicksand, Watson, Walker, Radnor, & Johnston, 2012; Christopher, 2016; Croom, Romano, & Giannakis, 2000; Fawcett & Waller, 2013; Kauffman, 2002; Lummus, Krumwiede, & Vokurka, 2001; Mentzer et al., 2001; Stock & Boyer, 2009; Zinn & Goldsby, 2014). Burgess, Singh and Koroglu (2006), for example, found that 57 per cent of the articles examined by them understood SCM to be a process, 24 per cent defined it as a system, while 9 per cent described it as a simple activity. SCM definitions can be divided into three categories: integrated logistics management, purchasing and procurement management and integrated SCM (Al-Shboul et al., 2017). SCM covers all the activities associated with planning and management, procurement, conversion and all logistics management operations, together with coordination and collaboration with channel partners (Soosay, Hyland, & Ferrer, 2008). While some researchers explicitly focus on the definition of supply chain management as an overall construct (e.g. Lummus et al., 2001; Mentzer et al., 2001; Stock & Boyer, 2009), others take a logistics-oriented perspective (e.g. Skjøtt-Larsen, 1999) or concentrate on purchasing as a central function in SCM (Tan, 2001). In addition, there are many different terms associated with SCM; for example, supplier integration, buyer-supplier partnerships, strategic supplier alliances or network supply chains (Cox, 1996; Croom et al., 2000; LeMay, 2017; Storey, Emberson, Godsell, & Harrison, 2006; Tan, 2001). Moreover, SCM definitions are often confused with those of the supply chain itself (Croom et al., 2000) or mixed up with the definition of supply chain orientation (Mentzer et al., 2001). Against this background, it is important to develop an

understanding of a definition of supply chain management for the thesis in order to contextualise the relevant theories of (E)RBV and TCT with SCM in the later chapters.

According to Swanson et al. (2018), SCM first appeared in 1982 (Oliver & Webber, 1982) and was synonymous with integrated logistics management. In 1986, the Council of Logistics Management (CLM) defined logistics management as a substitute term for SCM. In the 1990s, the necessity arose to reduce inventories, which not only have to be controlled within a company's boundaries, but also organised via supply chains (Cooper, Lambert, & Pagh, 1997). According to Cooper, Lambert & Pagh, discussion began to differentiate between SCM and logistics management. Accordingly, the CLM revised its SCM definition in 1998 and determined that logistics management is not a synonym of SCM, but part of it.

Several scholars adopted the logistically-oriented view while defining SCM in relation to major logistical processes (LeMay et al., 2017). For example, Lee and Billington (1995) defined it as “a network of facilities that procure raw materials, transform them into intermediate goods and then final products, and deliver the products to customers through a distribution system” (p. 43). In addition to the focus on logistics and process improvement, some researchers in the field of SCM have dealt with internal and inter-company relationships (Burgess, Singh, & Koroglu, 2006; LeMay, 2017; Stock & Boyer, 2009). Researchers focussing such relationships are concerned with the “social and economic associations between stakeholders both within and between organisations” (Burgess et al., 2006, p. 709).

In this context, some researchers have also taken a purchasing and supply perspective (Tan, 2001). They see SCM as a set of decisions and activities related to purchasing and supply management, while the purchasing function is seen as a source of the creation of competitive advantage through successful buyer-supplier relationships (Choon Tan, Lyman, & Wisner, 2002). According to Porter (1985), there are two basic ways which can lead to competitive advantages: cost advantages and differentiation advantages. The cost advantage arises when a firm can offer the same products or services at a lower cost than its competitors. The

differentiation advantage, on the other hand, describes the situation in which a company offers better products and services than its competitors. The strategic management of a company should be concerned with building and maintaining these competitive advantages (Porter 1985). According to Christensen and Fahey (1984), competitive advantages can arise when companies perform at a higher level than others due to certain attributes and resources. A competitive advantage is also defined as the implementation of “a value-creating strategy not simultaneously being implemented by any current or potential competitors” (Barney, 1991, p. 102) and when competitors are not capable of duplicating the strategy (Barney, 1991). This definition of competitive advantage implies that it is considered at the enterprise level (Barney, 2001). The underlying business strategy focuses on the question of how a firm's activities in different business areas or markets can create such advantage (Barney & Hesterly, 2010).

In this context, many firms have recognised that by leveraging the expertise of their supplier base, they can realise gains that can lead to sustainable competitive advantage (Cao & Zhang, 2011; Cousins & Spekman, 2003; Wiegel & Bamford, 2015). According to Cousins and Spekman (2003), supply chain management consists not only of managing the flow of products and services into the company; it also includes the management of the firm's supply processes. This means that the supply process permeates the entire organisation and supply management therefore also determines which resources are held or generated within the company and which are procured outside its boundaries. The supply process therefore also determines the competitive situation of the company (Cousins, 2002). According to Cousins (2002), if a firm changes its strategy, the supply structure must be changed according to the strategic orientation of the firm. The supply management of a company deals with the search, development and exploitation of external resources, as well as the determination of its core competences (Cousins, 2002). Supply management therefore deals with the flow of goods and services through the organisation, with the aim of making the business more competitive (Cousins & Spekman, 2003; Bari & Park-Poaps, 2020). Consideration of the creation of competitive

advantages based on the supplier's own resources and external resources is at the heart of the RBV-led discussion of vertical coordination between buyer and supplier (Barney, 2012).

Many scholars have recognised the importance of the management of buyer-supplier relationships as a success factor within supply chain management (e.g., Agus & Hassan, 2008; Cox, 1996; Lambert & Cooper, 2000; Lin, Chow, Madu, Kuei, & Yu, 2005; Choon Tan et al., 2002; Wiegel, & Bamford, 2015; Wynstra et al., 2019). The buying firms involved may consider their suppliers to be a virtual extension of the firm and are therefore keen to establish mutually beneficial relationships with them (Gandhi, Shaikh, & Sheorey, 2017; Mason, 1996). Competitive advantage can be derived from the fact that suppliers possess superior capabilities which contribute to the high quality of their own products (Ragatz, Handfield, & Scannell, 1997). Furthermore, by involving the suppliers at an early stage, technological advances can be rapidly integrated into the buying firm's own products (Ragatz et al., 1997). In addition, a trusting partnership with strategic suppliers is important because they have to deliver the non-core resources, while the buying company can concentrate on its own core competencies, which in turn are a source of competitive advantage (Prahalad & Hamel, 1990). This discussion, based on the resource-driven view in the context of competitive advantage, will be continued in the course of this work. Some researchers consider the supply chain management itself as a source of competitive advantage (Cousins, 2005; Harland, Lamming, & Cousins, 1999; Hartmann & De Grahl, 2011; Hitt, 2011; Ketchen & Giunipero, 2004; Kwak, Seo, & Mason, 2018; Storey et al., 2006).

Although the buyer-supplier relationship appears to be an important aspect within supply chain management (Wynstra et al., 2019), this consideration alone does not seem to be sufficient to reflect the complexity of such management. Therefore, in order to develop a definition of supply chain management which does not only emphasise logistics or purchasing-related areas, supply chain orientation (SCO) is taken into consideration, which can be understood as an implicit part of SCM. Against this background, the definition of SCO is first

presented in order to then expand it by adding the coordination of SCO activities via (at least) a direct supply chain. This extension then offers a valid definition for the term ‘supply chain management’ (Mentzer et al., 2001). SCO can be described as “the recognition by an organisation of the systematic, strategic implications of the tactical activities involved in managing the various flows in a supply chain. ... its management can see the implications of managing the upstream and downstream flows ...” (Mentzer et al., 2001, p. 11). A firm characterised by SCO might implement fragmented supply chain tactics, such as just-in-time delivery or EDI (electronic data interchange) systems (Mentzer et al., 2001). But as long as these tactics are not coordinated over the supply chain, at least in the form of the ‘direct supply chain’, they are not considered as SCM (Mentzer et al., 2001). Therefore, SCM can be understood as “the implementation of a supply chain orientation across suppliers and customers” (Mentzer, 2001, p. 11) or “the systemic, strategic coordination of the [traditional] business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole” (Mentzer, 2001, p. 18). The definition by Stock and Boyer (2009, p.706), which can be seen as a consensus of the various definitions within the SCM literature, contributes to the definition formulated by Mentzer et al. (2001) and adds some additional details:

The management of a network within a firm and between independent organizations and business units consisting of material suppliers, purchasing, production facilities, logistics, marketing and related systems that facilitate the forward and reverse flow of materials, services, finances and information from the original producer to final customer with the benefits of adding value, maximizing profitability through efficiencies, and achieving customer satisfaction.



For the purposes of this thesis, SCM is understood according to the definitions of Mentzer et al. (2001) and Stock and Boyer (2009), as the research focus is on the "extended supply chain" and in order not to limit the discussion to only one tier of the supply chain. This view is also compatible with the definition developed by Mentzer et al. (2001), who understand SCM as the management of "the sourcing, flow, and control of materials ... across multiple tiers of suppliers" (p. 6). In this context, according to Wynstra et al. (2019), supply chain management includes organisational boundary decisions that are the starting point for effective supply management functions. This work concurs with the understanding of the term supply chain management in this thesis.

This work specifically focuses on the connection between firm and supplier, as this upstream perspective represents a potential source for backward integration through M&A. Therefore, the study will also take buyer-supplier relationships into consideration, since, according to Cox's (1996) *Continuum of asset-specific external contractual forms*, strategic supplier alliances are closest to vertical (backward) integration through mergers and acquisitions. Cox explains this as follows: the closer the competencies of suppliers approach the core competencies (with high asset specificity) of the company, the more likely it is that external relationships can lead to mergers and acquisitions or, if this is not the case, to very close buyer-supplier relationships in which both parties have ownership rights to the goods or services produced (Cox, 1996). He refers to this form of buyer-supplier relationship as a strategic alliance. Based upon Cox's work *Relational competence and strategic procurement management* (1996) the *Continuum of asset-specific external contractual forms* will be discussed in more detail later in the thesis.

Since supply chain management includes boundary decisions (Axelsson et al., 2005 Wynstra et al., 2019), such as vertical integration through M&A, the following section clarifies the terminology of mergers and acquisitions and gives the definition adopted for this thesis. It also explores which determinants lead to M&A processes in the first place.

## 2.2 Mergers and Acquisitions

Mergers and acquisitions (M&A) have become relevant business strategies as they have the potential to significantly accelerate revenue growth (Carney, 2009; Eun & Resnick, 2010; Gaughan, 2010; Kumar, 2019). The fact that the worldwide number and volume of M&A deals has increased from 75,360, worth 3,752.7 billion U.S. dollars in 2009, to 96,665, worth 4,734.2 billion U.S. dollars in 2016 (Statista, 2017), underlines their relevance. This development is based on the assumption that companies increase their competitiveness through M&A (Otchere & Oldford, 2018).

Nevertheless, many M&A deals fail for various reasons, such as cultural issues (Child, Faulkner, & Pitkethly, 2001; Hodge, 2017); inadequate target selection; lack of synergies; lack of precision and execution of the integration process (Attah-Boakye, Guney, Hernandez-Perdomo, & Mun, 2021; Hitt, Hoskisson, & Ireland, 1990); theoretical valuation below future benefits; actual cost of complicated errors in negotiations; and external changes to the business environment (Christensen, Alton, Rising, & Waldeck, 2011; Straub, 2007). Some of the failure problems are long-term in nature, while firms and their leaders often take a short-term view, reflected, for example, in the link between high CEO compensation and merger activities (DeYoung, Evanoff, & Molyneux, 2009) and in the fact that CEOs with higher pay-risk sensitivity most notably engage in risky mergers (Hagendorff & Vallascas, 2011). Moreover, short-term CEO incentives indicate negative causal effects on long-term firm value in the context of mergers and/or acquisitions (Edmans, Fang, & Huang, 2017).

Despite the risk that M&A can fail, the figures above suggest that there are sufficient motives for companies to engage in them. The following discussion evaluates the definition of M&A and the reasons for them, and will associate both with supply chain management and with the underlying theories of the thesis, the TCT and (E)RBV.

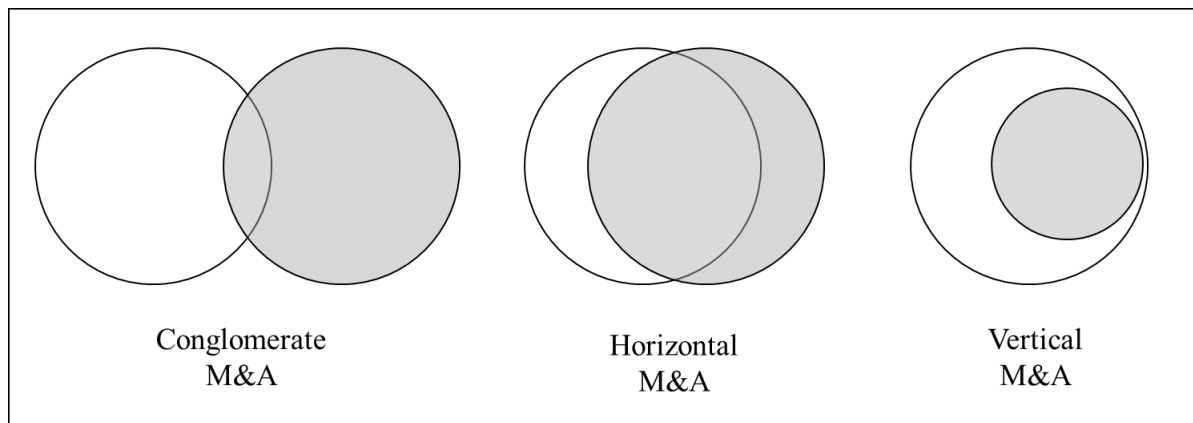
### 2.2.1 Definition of Mergers and Acquisitions

M&A transactions are characterised by the transfer or consolidation of the ownership of companies, business organisations or operational units with other companies (Gaughan, 2010). A merger is the voluntary fusion of two firms, in which one transfers all its assets to the other, which legally takes ownership of these and continues its operations (Gaughan, 2010). When two merging firms are around the same size, the term "mergers of equals" is often used (Gaughan, 2010).

Acquisitions occur when one firm or business purchases another (Damodaran, 2008) and when the buying company acquires more than fifty per cent ownership of the targeted company. Such transactions involve placing one firm's business under the ownership of the buying party, which then takes control of it.

The purchase can be friendly or hostile. A friendly acquisition is a takeover in which the management of the acquired firm approves the transaction, while a hostile takeover occurs when the acquirer purchases the target company by approaching the shareholders directly or seeking to replace the management in order to push the acquisition through. In the case of hostile takeovers, the management of the targeted firm is usually opposed to the acquisition. Both mergers and acquisitions lead to the consolidation of assets and liabilities under one entity. M&A are commonly subdivided into conglomerate, horizontal and vertical types (Tremblay & Tremblay, 2012). Figure 4 shows the different magnitudes of crossing-over processes according to the type of M&A.

Figure 4: Magnitude of crossing-over by M&A types (Source: adapted from Cho & La, 2014, p. 100)



Conglomerate mergers and/or acquisitions are the combination of companies in economically unrelated business activities and are the least popular type (Brealey, Myers, & Allen 2006). They represent the smallest overlap between the three types of mergers and acquisitions (Cho & La, 2014). There are two types of conglomerate merger: pure and mixed. Pure conglomerate M&A involve firms in completely different business activities. In mixed conglomerate M&A, companies bundle their businesses together to expand their range of products or services, to gain access to broader markets and customer groups, or to efficiently allocate capital (Marks & Mirvis, 2010).

Horizontal M&A occur when firms operating in the same industry or in a similar line of business are consolidated (Avinadav, Chernonog, & Perlman, 2017; Marks & Mirvis, 2010), leading to the greatest amount of crossing-over between the acquired and acquiring company (Cho & La, 2014). This business strategy is often practised by firms seeking growth in order to increase market power and realise synergies that will enable them to achieve economies of scale. Furthermore, firms can benefit from risk mitigation and diversification by providing a wider range of products and/or services (Hakkinen & Hilmola, 2005).

Vertical M&A occur when two companies that produce different products and/or services within the same value chain and/or supply chain merge (Avinadav et al., 2017; Brown

& Renwick, 1996). Characteristically, these companies have a buyer-supplier relationship. Vertical M&A refer to either forward or backward integration. Forward integration occurs when a company goes down the supply chain (e.g., to include control over direct sales) by buying or merging with another company. Backward integration, on the other hand, is the purchase or merger with companies (e.g., suppliers) that are located up the supply chain (Hill & Jones, 1989). According to Avinadav et al. (2017), economic theory has established that vertical mergers and acquisitions can increase supply chain efficiency (Lukas, Reuer, & Welling, 2012; Suzuki, 2009). “The supply chain management literature has yielded similar conclusions with regard to supply chain structures that are equivalent to vertical M&A, such as vertically integrated or centralized supply chains” (Avinadav et al., 2017, p. 926). This thesis deals with precisely this efficiency evaluation, taking into account transaction cost theory and the corresponding constructs. In addition, the resource-based view is employed in the work, which deals with competitive advantage through resource combination that goes beyond an increase in efficiency.

The analysis of the thesis focuses on the 'extended supply chain', with emphasis on upstream parties. Some firms view suppliers as virtual extensions of their supply chain (Gandhi, et al. 2017; Mason, 1996); therefore, vertical M&A could be understood as a twofold extension: a de facto expansion through vertical integration through M&A, and a further virtual expansion through the supplier base of the acquired company.

Against this background, if one considers the ultimate supply chain, which includes all the firms involved in all upstream and downstream product, service, finance and information flows from the end supplier to the end customer (Mentzer et al., 2001), M&A processes do not exclusively lead to an expansion of the supply chain to upstream suppliers, but to an expansion of it in several dimensions.

This can be explained by Figure 1, which shows the types of channel relationships. Through a merger with or the acquisition of a supplier, an extension is not only created in the

direction of the ultimate supplier, but also in the direction of all the other organisations involved, such as third-party logistics suppliers or financial providers, who can belong to the supplier base of the acquired company and thus result in the virtual extension of the supply chain.

This conclusion is particularly relevant in light of the theory of the extended resource-based view of the firm (ERBV), which states that the interaction between firms and their external environment generates competitive advantages (Lewis, 2000). Therefore M&A could not only generate competitive advantages through the acquisition or merger of another company, but also through the extended virtual supply chain.

If one follows the logic of a virtual extension of the supplier base, even M&A processes within the framework of the 'direct supply chain' inevitably result in a virtual extended supply chain. Against this background, it is a logical consequence that, at the very least, the inclusion of the extended supply chain as a supply chain perspective is the right approach in this thesis. Combining this perspective with the forms of M&A discussed, it emerges that the thesis focuses on vertical M&A in the context of backward integration.

A research gap is evident here: there are no studies in the literature to date that examine the impact of influencing factors of the extended supply chain, which, in terms of backward integration, includes suppliers and their supply base, on M&A.

This section has facilitated better understanding of the definition of M&A relevant to this work, including various definitions of the supply chain. Therefore, the following chapter will focus on why M&A processes in fact take place and the discussion will consider the motives that lead firms to engage in M&A.

## 2.2.2 Determinants of Mergers and Acquisitions

M&A activities can be seen as strategic transactions based on numerous expected economic benefits, such as synergies, diversification, growth, expanded market share, increased pricing power in the supply chain, the elimination of competitors (Carney, 2010; Eun & Resnick, 2010; Gaughan, 2010), improved critical competences (Luo & Tung, 2007), and cost efficiency gains (cost reduction) (Dao & Bauer, 2021; Jensen & Ruback, 1983). In addition, acquisitions can also provide access to new knowledge assets (Mazon et al., 2017; Mowery, Oxley & Siverman, 1996) or new markets and technologies (Choi & McNamara, 2018; Zollo & Singh, 2004).

In M&A, firms should not only strive to realise short-term financial value, but also to create long-term strategic value (Lu & Feng, 2010). In general, both financial and non-financial motivations can be drivers for M&A. Non-financial reasons can, for example, be traced back to the compensation of CEOs (Bliss & Rosen, 2001; DeYoung, Evanoff, & Molyneux, 2009). Bliss & Rosen (2001) found that mergers have a positive net effect on remuneration, mainly through the influence of company size. Remuneration usually increases even if the share price of the acquiring company falls in mergers, as is usual after a merger notification. The form of compensation affects the merger decision, in that CEOs with higher share-based compensation are less likely to make an acquisition. On the other hand, according to Eun and Resnick (2010), synergies are the driving force behind financially motivated M&A transactions. Carney (2009) and Hassan and Mayrhofer (2018) identified economies of scale and increased business size as very relevant factors. The following sections will therefore focus on the economies of scale, market share/power, cost efficiency gains and evaluation of synergies which can be derived from M&A.

Economies of scale are characterised by the inverse proportionality between output and marginal costs, and can be defined as a fall in average unit costs at the same time as increased

output (Brealey, Myers, & Allen 2008). The existence of economies of scale is one of the important factors determining whether it is economically viable for a firm to be vertically integrated (Hobbs, 1996; Lambrecht, 2004). There are both long- and short-term economies of scale. Short-term ones occur when the merger of two companies results in the consolidation of costs, such as those of administration, manufacturing, distribution and sales-related ones (Christensen et al., 2011). The prerequisite for achieving economies of scale after a merger is that only one dedicated team is responsible for the administration processes instead of two. If the increase in production after an M&A is greater than the increase in combined inputs, including physical capital, this is referred to as the long-term economies of scale effect (Röller, Stennek, Ilzkovitz, Meiklejohn, & Verboven, 2006). M&A therefore create the opportunity for firms to realise cost efficiency and sustainable competitive advantage through economies of scale (Carney, 2009). This effect is accompanied by improved bargaining power, as orders may rise and bulk-buying discounts are more likely to be attained than before the merger or acquisition (Carney, 2009; Huang, Huang, & Chen, 2013). In addition, the elimination of redundant operating units and departments has a positive effect on cost reduction (Dao & Bauer, 2021; Jensen & Ruback, 1983). Economies of scale can also be regarded as a motive from the supply chain perspective. One motive behind the formation of a supply chain arrangement is to increase competitive advantage (Monczka, Handfield, Giunipero & Patterson, 2015). In this context, an objective of supply chain management is to reduce the costs required to guarantee the necessary service to customers (Stevens, 1989). As already explained earlier, competitive advantage can be exploited by reducing costs (Porter, 1985), which can be achieved as a result of M&A by reducing purchase prices (through bulk buying), eliminating redundant costs and consequently by cost efficiency. Consequently, the realisation of cost efficiency through M&A also serves as a motive for entering into SCM agreements if a competitive advantage can be achieved as a result. According to this logic, it can also include the extension of a supply chain through M&A. In this context, the theoretical basis of TCT plays an important role, as it is



essentially concerned with the efficient management of transactions, that is, the realisation of cost efficiencies, and exchange relationships (Ketokivi & Mahoney, 2020). However, no determinants have yet been indicated in the literature that could have an influence on M&A with a firm's suppliers. The identification of potential determinants is discussed and implemented in more detail in section 2.3 below.

Moreover, through M&A firms can gain market share or even enjoy a leading market share without expanding their market position through long-term organic growth (Carney 2009). This is accompanied by increased market power and revenues. According to Gaughan (2010), both market power and higher revenues are among the main drivers of M&A. Market power can be described as the ability of market participants to control margins, prices or the nature of products sold and consequently generate above-average profits (Seth, 1990). In particular, market power can be gained through the creation of monopolies and oligopolies (Andrade, Mitchell, & Stafford, 2001). Higher revenues help companies to increase competitiveness and at the same time to profit from low prices for products which are characterised by a high price elasticity of demand (Röller et al., 2006). Both the introduction of new technologies or innovative products, and the entry into new markets, can have a positive effect on the growth of firms (Sudarsanam, 2003). Besides creating growth, firms can benefit from obtaining patents, maintaining recognised brand names, or expanding product lines and markets (Carney 2009). In turn, these factors can be understood as valuable resources, meaning that this motive can be related to the resource-based view of the firm, as the above-mentioned factors are resources that are controlled by a firm and may enable it to design and implement strategies that on the one hand improve efficiency and effectiveness, and on the other create competitive advantage (Barney, 1991). The extent to which resources within a supply chain actually function as determinants in the vertical integration of suppliers through mergers and acquisitions appear to be a research gap that has not yet been explored and is therefore addressed in this study.

Exploiting synergies between the combined value chains of firms represents the most common motive for M&A (Alexandridis, Petmezas, & Travlos 2010; Bradley, Desai, & Kim, 1988, Seth; 1990; Seth, Song, & Pettit, 2000; Weber, 2019). The realisation of synergies is based on the idea that the value of combining the assets of two firms is significantly higher than the sum of the firms (Eun & Resnick, 2010; Dhir & Mital, 2012). In addition to operational, administrative and financial synergies, the effect is attributable to the increase in revenues and performance, while simultaneously reducing costs (Gaughan 2010; Gondhalekar & Bhagwat; 2003). Operational synergies are production-related or administration-related efficiency effects (Chatterjee 1986; Gupta & Gerchak, 2002), which can be traced back to either revenue-increasing operating synergies or cost-reducing ones (Gaughan, 2010). Financial synergies can be realised, for example, through tax advantages, supplementary growth opportunities or debt co-insurance (Mihaiu, 2018; Sudarsanam, Holl, & Salami, 1996). In addition, Clougherty and Duso (2011) mention the combination of scarce resources under the concept of collusive synergies, which allow companies to increase their market power and reduce competition when prices and profits increase for all companies in a market. Cost reductions (Gaughan, 2010), as well as the acquisition and thus combination of scarce resources (Clougherty and Duso, 2011), appear to be important determinants for M&A in relation to generating synergies. Cost reductions, for example in the sense of lower transaction costs, can be achieved under certain conditions by extending the firm's boundaries through vertical integration (Argyres & Zenger, 2012). A firm will undertake backward integration of supply chain activities if, on the one hand, transaction costs could be reduced and on the other to gain control of the supply of valuable assets and to prevent potential competitors from gaining access to these (Williamson, 2008). Following this line of argument, transaction costs are relevant from a TCT perspective, while valuable assets can also be understood as company resources, on the basis of which the vertical integration of supply chain activities can also be considered from a resource-based view (Barney, 1991; Foss, 1997; Hitt et al., 2016), as previously explained.

The motives and explanations for M&A can therefore be divided into cost efficiency gains through vertical integration (Chemla, 2003); transaction cost-related explanations (Dyer, Kale, & Singh 2004; Harzing, 2002; Kale, Singh, & Raman, 2009); and the resource-based view of M&A (Ferreira, Santos, Almeida, & Reis, 2014).

According to Chemla (2003), vertical M&A imply the potential to increase cost efficiency. Savings can be achieved by eliminating opportunism, which could have led to self-interest in the behaviour of both parties prior to the M&A. In addition, they remove the vertical restraints that may have contributed to the operating costs of the companies before the merger or acquisition (Chemla, 2003). Vertical restraints are competition restrictions in agreements between firms that relate to different levels of production and distribution processes (Butler & Bysinger, 1983). For example, in a situation where an upstream firm has difficulties persuading its downstream retailer to act in the interests of the upstream firm, vertical integration through M&A can provide a remedy to remove such vertical restraints. This allows the company to reduce its own operating costs and improve efficiency through vertical mergers or acquisitions (Chemla, 2003).

The different forms of agreements within supply chains, from contractual relationships to joint ventures (Bonatto, de Resende, & Pontes, 2021; Cox, 1996; Hobbs, 1996), play an essential role; in this thesis, SCM is understood as the management of a network, not only within a firm but also between independent organisations (Stock & Boyer, 2009). Therefore, vertical restraints also play an important role in SCM. Throughout the literature on vertical supply chains, the market power of sellers is frequently discussed; for example, in a consecutive monopoly or duopoly (Bjorvatn, Milford, & Sørgard, 2015). A common framework would involve a market-dominant manufacturer offering a contract to a retailer, and the retailer offering prices to final consumers (Bjorvatn et al., 2015). The question then arises as to how vertical restraints, such as exclusivity agreements between the manufacturer and the retailer, can affect retail prices (Miklós-Thal, Rey & Vergé, 2010). In this case, from a supply chain

perspective, M&A could provide an opportunity to remove restrictions and opportunism, gain control over prices and reduce operating costs that may have been a result of vertical restraints (Chemla, 2003).

In this context, opportunism in particular seems to be an important factor within the relationship between supply chain actors. It describes the opportunistic behaviour of decision-makers driven by the prioritisation of their self-interests, which in turn influences decisions on how to conduct economic exchange along the vertical coordination within the supply chain (Williamson, 1975). Opportunism is an important element in TCT theory, and will be discussed in more depth in the following section.

Besides operating costs, scholars have especially utilised transaction cost theory to explain M&A (Ferreira et al., 2014). However, their focus has not been on explaining motives for M&A as such. Instead, TCT was used to explain why certain modes of entry into foreign markets are preferred to others (Dyer et al., 2004; Harzing, 2002; Hennart & Park, 1993; Kale, Singh, & Raman, 2009; Kathuria, 2018). In this sense, Hennart and Park (1993) stated that greenfield ventures have lower transaction costs than M&A because they neither incur costs for employee retraining, nor are there risks of insufficient integration of different corporate cultures after M&A. Moreover, M&A seem to lead to more organisational efficiency than other opportunities for entering international markets (Harzing, 2002; Yip, 1982).

While cost effects appear to be significant drivers for M&A (Carney 2009), researchers have also attempted to explain M&A through resource-, skill- or knowledge-based views of the company (Chen, Meng, & Li 2018; Ferreira et al., 2014). The resource-driven study by Deng (2009) on M&A motives provides this complementary perspective. Deng examines the resource-driven motivation based on the idea of acquiring strategic assets. These assets refer to resources that can potentially contribute to the company's competitive advantage (Amit & Schoemaker, 1993). From this resource-driven M&A perspective, M&A enable companies to combine, for example, their knowledge and skills, their specific know-how, and their raw

materials and physical locations to strengthen their position; for example, through the modernisation provided by new technologies (Deng, 2009). Similarly, Child and Rodrigues (2005) and Luo and Tung (2007) explain that firms want to expand their market primarily in order to improve their critical competencies, rather than simply using existing assets.

In this context, M&A can be understood as vehicles used by acquirers to learn and expand resources and capabilities that are not available on the factor market (Barney, 1986; Ferreira & Tallman, 2007). From this resource-oriented perspective, M&A offer firms the opportunity to reconfigure their capabilities and resource pool by building on existing resources, as well as implementing and leveraging entirely different ones (Ferreira & Tallman, 2007; Karim & Mitchell, 2000). Due to competitive pressures, companies must constantly change their mix of resources in order to open up new opportunities (Penrose, 1959). Kogut and Zander (1992) state that new capabilities are the product of the combination of new skills and resources. Firms could use acquisitions if there were too many impediments to the internal development of resources and capabilities (Karim & Mitchell, 2000). Acquisitions can accelerate the development of capabilities by allowing immediate entry into a market and can therefore also act as an alternative to investment in research and development (Hitt et al., 1990). Karim and Mitchell (2000) conclude that acquisition participants tend to change far more than non-participants and state that “acquisitions behave as mechanisms for change in the sense that they provide a target and acquirer with new resources and opportunities” (Karim & Mitchell, 2000, p. 1066). M&A could be an instrument for strategic change, as such resources can be obtained through external acquisitions (Barney, 1999) of complementary resources from outside firms’ boundaries (Argyres, 1996). The recombination and reconfiguration of resources and competences within inter-firm relations can increase value generation accordingly (Dyer & Singh, 1998). Supply chain management involves the exploitation of external resources and the determination of the company's core competencies; when a company changes its strategic direction, the supply structure must also be adjusted accordingly (Cousins, 2002). Such an

adjustment of the supply structure could be accompanied by a merger with, or an acquisition of, a supplier up the supply chain, which in turn has its own suppliers.

The preceding discussion strengthens the intention of the study to fill the existing research gaps; on the one hand, to identify determinants of vertical integration that arise from the resource-based view, and on the other, to understand their influence on the implementation of mergers and/or acquisitions.

This initial resource-based discussion will be explored further in section 2.4.1 The transaction cost theory is discussed in the following section, both with regard to its applicability in the context of studies on SCM and to boundary decisions.

### 2.3 Transaction Cost Theory (TCT)

As mentioned in the previous section, TCT provides relevant approaches in the context of vertical integration, and M&A in particular. In this section, the transaction cost theory is therefore first introduced with its essential characteristics. The two main forms of corporate governance are presented and explained, together with the concepts of limited rationality and opportunism, which can be understood as human influencing factors. The three central constructs of TCT, namely asset specificity, uncertainty and frequency, are then discussed in relation to how they are frequently applied in the literature, both in SCM research and in research on vertical integration.

Subsequently, this literature research provides insights into TCT in the context of boundary decisions of firms, especially with regard to vertical integration.

### 2.3.1 TCT and SCM

Transaction cost theory (TCT) is one of the most widely discussed theories in operations and supply chain management research, as one of its central themes coincides with an important area of supply chain management research, namely the efficient management of transactions in particular, and exchange relationships in general (Ketokivi & Mahoney, 2020). TCT is concerned with central questions related to this research: Why do firms exist? How do firms define their boundaries? and How should they govern their operations? There is great interest in transaction cost theory because its focus on exchange is applicable to different areas (Coase, 1937; Rindfleisch, 2020; Rindfleisch & Heide, 1997; Williamson, 1975).

Two very important approaches can be seen in the early versions of the transaction cost frameworks of Coase (1937) and Williamson (1975, 1985). These works are important because they provide both a basis for the explanation of vertical integration and for a framework for SCM. According to Hobbs (1996, p.13) “transaction costs, and their reduction, lie at the heart of the interest in supply chain management. Proactive moves to enhance management of supply chains are fundamentally concerned with improving their efficiency to gain competitive advantage”. Likewise, Croom et al. (2000) and Ketokivi and Mahoney (2020) underline that SCM is supported by the TCT approach. “TCT is essentially a theory of efficient governance of transactions in particular and exchange relationships in general” (Ketokivi & Mahoney, 2020, p.1011). The different governance modes within the supply chain range from fully vertically integrated networks to completely independent ones. According to Ellram (1991), vertical integration, for example, through M&A, can be seen as an alternative to supply chain management as it enables efficient management through associated control. Obligational contracting, on the other hand, is a form of supply chain management insofar as it allows the different supply chain units to be linked together by formal agreements (Ellram, 1991).

Williamson (2008) also provides a useful discussion about the application of TCT theory in SCM. When firms need to make decisions about whether to enter into a particular mode of governance within the supply chain, this is based on both the initial cost and the ongoing cost of the transaction (Hitt, 2011). The firm must first decide whether certain activities within its supply chain should be internalised or whether suppliers could be used for them. Vertical integration (through M&A) can be advantageous if the firm then has control over this part of the supply chain and consequently prevents potential competitors from receiving critical information. If, on the other hand, a firm is not as efficient as an external supplier in performing an activity, it may be advantageous not to internalise this part of the supply chain (Hitt, 2011). Control over certain parts of the chain therefore plays a role; likewise the efficiency, or from the TCT perspective, the level of transaction costs, which will be examined in more detail below.

Transactions are the basic units of analysis in transaction cost theory (Williamson, 1985). In an economic system based on the division of labour and specialisation advantages, there are numerous and diverse exchange relationships between individuals. These form the starting point of transaction cost theoretical considerations. However, it is not the exchange of goods itself that is the focus of interest, but the logical and temporal transfer of property rights (Furubotn & Pejovich, 1972; Picot, 1981).

A transaction thus means the transfer of property rights in relation to goods and services. This transfer usually precedes the material exchange of goods in time (Picot & Dietl, 1990). Transactions are thus in principle the explicit and implicit (contract) negotiations about goods and services between at least two parties. Transaction cost theory claims that any object of analysis that can be described explicitly or implicitly as a contract problem can be subjected to transaction cost theoretical analysis (Williamson, 1985).



Accordingly, transaction costs are associated with those involved in executing any economic trade and incurred in overcoming market imperfections; they can be explained as “the costs of carrying out any exchange, whether between firms in a market place or a transfer of resources between stages in a vertically integrated firm” (Hobbs, 1996, p. 17). Transaction costs are typically divided into *ex ante* and *ex post* ones. Examples of *ex ante* costs include those associated with gathering information; with identifying the supplier; with negotiations; and include various other costs incurred prior to finalising a contract. *Ex post* transaction costs most notably include ones for monitoring and controlling the supplier incurred after the conclusion of an agreement (Williamson, 1979).

According to several researchers (e.g., Jung, 2003; Rindfleisch, 2020; Rindfleisch & Heide, 1997; Lee, 2005; Pillai & Sharma, 2003), Coase’s (1937) work *The Nature of the Firm* is seen as the origin of transaction cost theory. Coase explains the existence of a firm based on the idea that firms will organise their production once the transaction costs within them are lower than by organising the production through market exchange. According to Coase, firms represent substitutable governance structures to markets, while differing in their transaction costs. This notion represented the first debate on different governance modes and the choices amongst them (Coase, 1937). Williamson (1975, 1985, 1996) further developed Coase’s framework, expanding it by proposing explanations of which factors have an impact on the decision of taking a specific governance form, such as asset specificity, uncertainty or transaction frequency. These constructs of the theory are explained later in this chapter. TCT provides explanations not only for the existence and structure of firms, but also for vertical coordination within a supply chain (Hobbs, 1996; Zylbersztajn, 2018). Understanding transaction costs, in particular their reduction, and the various forms of vertical coordination, are of importance within supply chain management (Hobbs, 1996; Um & Kim, 2019).

Vertical coordination is a continuum extending across the range of possible modes of governance (Zylbersztajn, 2018; Hobbs, 1996). There are two main modes of corporate

governance, transactions within the market, and hierarchy, which are commonly referred to as the market and the firm. Both differ greatly with respect to their coordination mechanisms (Heide, 1994). While transactions within the market are coordinated through the mechanism of supply and demand, firms are vertically integrated constructs maintaining control within their hierarchy (Heide, 1994). Spot markets (e.g. auction markets or supermarkets) are at one end of the range of governance modes, with price being the only determinant for the execution of the transaction (Hobbs, 1996). According to Hobbs, negotiations on product quality, for example, would lead to a more formal exchange agreement, which could result in a form of contract. At the other extreme of the scale is vertical integration (e.g. through M&A), where products move not only in the direction of prices but also between the different stages of the production processing and distribution chain as a result of internal supply chain management orders (Hobbs, 1996). Between the extremes of markets and hierarchies, there are many other variations of governance modes (Heide, 1994), ranging from preferred suppliers to single sourcing relationships, network sourcing, and strategic supplier alliances (Cox, 1996).

Governance modes reflect different degrees of supply chain management. Under a contract, a firm transfers control of various aspects of the supply chain, such as the production of certain goods or services, to a supplier (Hobbs, 1996). Full vertical integration, on the other hand, involves a firm taking control of, for example, two or more successive stages of the supply chain (Hobbs, 1996). Governance modes in which supply chain management techniques are deemed to be most suitable include short-term contracts, long-term contracts and joint ventures, as well as equity and interest rate contracts, while, as explained above, vertical integration can be considered an alternative to SCM (Ellram, 1991). A firm can be integrated forwards (downstream), for example, in distribution functions, or backwards (upstream), for example, in delivery functions (Hobbs, 1996). As discussed in the section “Definition of Mergers and Acquisitions”, backward integration into supply functions can take place through vertical M&A. The supply chain can be extended in real and virtual terms by integrated suppliers, as

these can be regarded as a virtual extension of the supply chain (Gandhi et al., 2017; Mason, 1996). According to TCT, one of the most important determinants of vertical integration is the nature and level of transaction costs (Williamson, 1975). Accordingly, a change in such costs resulting from an economic change can lead to a shift in supply chain management. Williamson (1975) emphasises that bounded rationality and opportunism affect decisions on how to conduct the economic exchange. He states that transaction costs include both the direct cost of managing relationships and the possible costs of making inferior governance decisions. The degree of transaction costs is influenced by three dimensions: asset specificity, uncertainty and transaction frequency.

Bounded rationality was initially addressed by Simon (1957) and is based on the idea that when human beings make decisions their rationality is limited by the manageability of the decision problem, the cognitive limitations of their mind and the time available to decide. Individuals are not capable of deciding on a rational basis as a result of their imperfect perspective of the environment surrounding them and due to the inaccessibility of complete information. Decision-makers have individual values and belief systems, established through their life experiences. Therefore, not all individuals will approach the decision-making process in the same way. A decision will be made within the bounds of rationality. Decision-makers view their decisions as rational, based on their own belief systems and values and may maximise their own benefits by acting within their cognitive limit. Connecting this approach to TCT, incomplete contracts could be a result of bounded rationality (Hart, 1995).

Opportunism refers to the assumption that decision-makers might prioritise their self-interest when faced with certain opportunities and is concerned with the difficulty of knowing a priori whether someone is trustworthy or not (Barney, 1991). Williamson (1975) claims that managers act in a self-interested manner and behave with guile to reach their targets. From his point of view, as opportunism occurs (to some degree) in every organisation, the reduction of its exposure to it is one of the most important tasks for decision-makers with regard to the

management of firms' resources. Therefore, opportunism also influences contract incompleteness (Williamson, 1999).

The existence of opportunism and bounded rationality makes the discussion concerning governance choices relevant, as they embody the reasons for the actual inefficiency in economic allocation. Otherwise, transactions within the market would be both more advantageous and more secure than vertical integration (Williamson, 1985). From the supply chain perspective, and in connection with buyer-supplier relationships, opportunism plays an important role. Hobbs (1996) states that in a situation where a buyer has only a few alternative suppliers to choose from in the market, it is probable that an existing one might modify the underlying business terms of the relationship to its advantage, based upon opportunistic behaviour. The task of supply chain management to make boundary decisions is once again reflected here. As already explained, Hobbs uses TCT to explain vertical coordination within a supply chain as a continuum that extends across the spectrum of possible governance modes (Hobbs, 1996), ranging from transactions on the market (or outsourcing) to vertical integration, such as backward integration through M&A.

Asset specificity also refers to the inter-party relationship of a transaction. It can be defined as the extent to which a specific investment is of higher value to that transaction or, in Williamson's words, as "the degree to which an asset can be redeployed to alternative uses by alternative users without sacrifice of productive value" (Williamson 1989, p. 142). Therefore, high specific investments have little to no value outside the inter-party relationship (Klein, Crawford, & Alchian, 1978; Williamson, 1981).

For example, if a supplier has invested in machines that are used exclusively to produce a part for a customer's assembly plant, they face few alternative actions if the customer demands price reductions.

The potential for misappropriation raises the cost of market exchange by making contractual negotiations more contentious, instigating parties to invest in contractual safeguards, and by reducing investment in other efficiency-improving, relation-specific assets. Vertical integration provides a means of avoiding these inefficiencies by aligning incentives, providing access to a greater range of administrative controls, and allowing for more frequent and cooperative adaptations to the exchange (Leiblein & Miller, 2003, p. 844).

With high asset-specific investments, comparative cost advantages can be gained through the associated specialisation advantages which reduce production costs (Williamson, 1985). Transaction costs, on the other hand, can increase due to such transaction-specific investments. By increasing the specificity of the input factors, the relationship between the parties changes. Switching to another transaction partner is becoming increasingly difficult because either the so-called quasi-rents, that is, the difference in revenue with the next possible use of the factors, and/or cost advantages induced by specificity, are lost as a result (Ebers & Gotsch, 1995). Quasi-rents are subject to the risk of opportunistic behaviour on the part of the transaction partner, who can threaten the owner of the specific capital with the termination of the transaction relationship and in this way usurp the quasi-rents of the partner, for example by changing the ex ante agreed prices in its favour. The owner of the specific capital will maintain the transaction relationship as long as an additional profit over the next best use can be made. Consequently, the transaction relationship is only terminated when the quasi-rent is fully expropriated. To reduce the risk of opportunistic exploitation of the quasi-rent, it can be secured through certain forms of governance (Peteraf, 1993; Royer, Gretzinger, & Brown, 2019). High asset specificity is the mitigating factor concerning effects of opportunism by strengthening the degree of dependency between firms' relationships and it has a tendency to reduce uncertainty and opportunism as the likely risk of default might be too high (Williamson, 1985).

According to Williamson (1985), asset-specific investments are commonly categorised as human specificity (e.g., highly specialised human skills); physical specificity (e.g., specialised machine tools or complex computer systems); site specificity (e.g., natural resources are readily available, or a plant is located close to a customer); and dedicated assets (e.g., an investment in an asset that cannot easily be used for other purposes). High asset-specific investments represent crucial firm-specific resources for the creation and maintenance of strategic advantage (Williamson, 1981; Zhao, Luo, & Suh, 2004). Therefore, transactions with high asset specificity will be performed within the firm, given its capability to save contractual and monitoring costs through more efficient internal mechanisms (Williamson, 1999).

Asset specificity is also related to the core competencies of a firm (Prahalad & Hamel, 1990). These competencies are the specific skills and abilities of firms, which Cox (1996) and Richardson (1996) believe should be retained within them. From their point of view, these core competencies, which are characterised by a high degree of asset specificity, should not be subject to external transactions. Transactions with low and medium asset specificity, on the other hand, can be outsourced in a gradation of hybrid cooperation within the framework of vertical coordination (Cox, 1996; Richardson, 1996). According to Hobbs (1996), from a supply chain perspective, products that are non-specific in nature or produced with non-specific assets tend to be acquired on the spot market. Hobbs argues that the higher the asset specificity, the further the governance mode moves away from the spot market towards a formal supply chain form, such as vertical integration (through M&A) at the end of the spectrum of vertical coordination. The degree of vertical coordination depends on whether one or both parties make asset-specific investments (Hobbs, 1996).

Another construct of TCT, which also influences the form of governance of a firm, is uncertainty, which is concerned with environmental circumstances framing the transaction (Crook, Combs, Ketchen, & Aguinis, 2013; Leiblein & Miller, 2003). Environmental uncertainty arises when the conditions surrounding the transaction cannot be specified in

advance (Williamson, 1979, 1985). Uncertainty can be divided into two areas: uncertainty in the external environment, which is created on the market side, and internal uncertainty, which is created by the firm itself (Williamson, 1985). External uncertainty can be attributed to the degree of volatility and unpredictability of market developments. In this context, changes in availability, changes in technologies, price changes and other significant market disruptions play a decisive role. Internal uncertainty occurs in potential buyer-supplier relationships when firms are uncertain about the requirements and therefore cannot verify whether their suppliers will meet the requirements (Amaral, Billington, & Tsay, 2006). Both types of uncertainty result in an increase in ex ante and ex post transaction costs. The ex ante costs rise because several environmental and behavioural conditions have to be anticipated and agreed upon. This process is usually incomplete, which means that the ex post transaction costs rise due to the adjustment and control costs. This effect is reinforced by the presence of specific investments, since it is assumed that the parties are more motivated to specify or renegotiate situations contractually (Afuah, 2001).

A firm faced with uncertain requirements will tend to keep these transactions within its boundaries in order to maintain control over unpredictable benefits and costs. In the context of SCM, a low degree of uncertainty (e.g., regarding certain quality features) tends to lead to transactions on the spot market, while a high degree of uncertainty tends to lead to forms of vertical coordination that involve more control, such as contracts, strategic alliances or vertical integration (Hobbs, 1996; Sabet, Yazdani, & De Leeuw, 2017). If these transactions are made outside the firm's boundaries, its flexibility is limited, as it would then have to specify exactly what is and is not part of an external contract. Due to the uncertainty in the requirements regarding such an activity, there is a risk that the specification will be insufficient, and that the results of the performance will not meet requirements. Against this background, TCT predicts that activities of this kind will be performed internally; that is, within a firm's boundaries (Amaral et al., 2006; Williamson, 1985). In relation to a contractual agreement, if one party has

no guarantee that the other will fulfil its obligations in accordance with the agreement, uncertainty arises. Consequently, there is a risk that a company will incur expenses for a product or service that will ultimately result in inadequate results. In these circumstances, TCT predicts that firms will conduct such activities within their boundaries (Ellram, Tate, & Billington, 2008; Williamson, 1985). Uncertainty also refers to the extent to which contractual, monitoring and enforcement costs are augmented by environmental and behavioural unpredictability. Given the presence of asset specificity, the higher the uncertainty, the more likely it is that the transaction will move towards the firm (as opposed to the market) as the beneficial governance structure as “uncertainty incentivizes expropriation when a party's specific investment is exposed” (De Vita, Tekaya, & Wang, 2010, p. 658). Different hybrid governance modes are possible between the two extremes of the market and the firm, which will be beneficial if frequent transactions occur at a medium level of asset specificity (Williamson, 1985, 1991).

Transaction frequency, which refers to how often a transaction occurs (Williamson, 2008), also plays a role in transaction costs and vertical coordination in addition to asset specificity and uncertainty. The higher the frequency, the higher the monitoring costs. In order to lower the costs, the firm is the beneficial structure, given that the transaction frequency can be decreased (Williamson, 2008). A high number of transactions provides participants in a supply chain with information about each other. It can also result in parties learning to appreciate repeated transactions and not wanting to damage their own reputation through opportunistic behaviour (Hobbs, 1996). Such a situation tends to be characterised by transactions on the spot market. Nevertheless, the more often a specific, uncertain and complex transaction is performed, the stronger the tendency towards vertical integration (Picot & Franck, 1993).

According to Williamson (1983), a firm's choice of whether to rely on internal or external sources for recurring transactions depends on whether the transaction relates to specific assets. From the Williamson's perspective, external sourcing is appropriate when asset

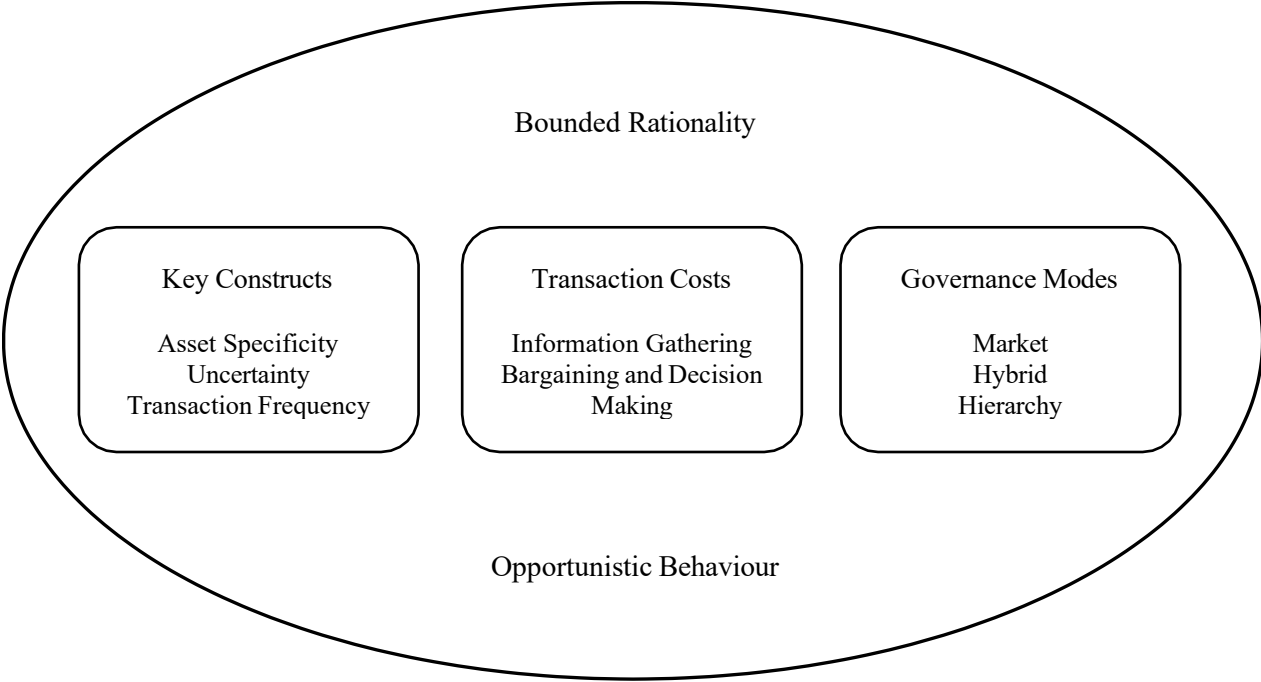


specificity is low, as the market for the traded goods is competitive and the firm can procure high quality components at a reasonable cost, which is independent of the frequency of the transaction. With high asset specificity, on the other hand, the firm should strive for vertical integration in recurring transactions because "internal organization permits greater adaptation to changing circumstances" (Williamson 1983, p. 108). In the case of low transaction frequency and high asset specificity, external procurement can be advantageous if the firm is able to avoid costly investments (Williamson, 1983). In addition to the two extreme forms of market and hierarchy, intermediate forms of governance may also be appropriate in such a situation "because of the limits of classical contract law for sustaining these transactions. If the firm cannot enter into this type of modified external sourcing arrangement, sourcing internally may render more advantages to the firm" (Murray, Kotabe, & Wildt, 1995, p. 187).

The influencing factors emanating from TCT are asset specificity (also referred to as core competencies), uncertainty and transaction frequency, all of which in turn lead to transaction costs, which are made up of costs for information searches, for negotiation and decision making, and for the policing and enforcement of transactions (Williamson, 1985). In light of this, different modes of governance along the continuum of vertical coordination are advantageous in certain circumstances, from market to hierarchy, which can be achieved through mergers with, or acquisitions of, suppliers. A simplified illustration of these interrelationships is shown in Figure 5.

Figure 5: Simplified TCT including key constructs, transaction costs and governance modes

(Source: Author)



TCT has therefore often been used in the literature as a basis for examining vertical integration as a mode of governance. However, this has not concerned the integration of entire companies through mergers and acquisitions, but rather about very specific transactions, not to mention the integration of suppliers in the supply chain. This represents a significant research gap that this study attempts to fill.

Since vertical coordination is directly related to boundary decisions, especially in the case of vertical integration, these boundary decisions will be set in the TCT context in more depth in the following section.

### 2.3.2 TCT and Boundary Decisions

Early applications of the transaction cost theory focused on vertical integration and make-or-buy decisions (Rindfleisch, 2020; Rindfleisch & Heide, 1997). The focus of these studies was typically on evaluating manufacturing firms' decisions on backward integration into the supply of materials or components (e.g., Monteverde & Teece, 1982; Levy, 1985; Lieberman, 1991) or forward integration into distribution and sales (e.g., John & Weitz, 1988).

Some researchers have emphasised the role of relationships within supply chains against the background of TCT. In the context of these hybrid governance modes (e.g., inter-firm relations and cooperation), buyer-supplier relationships (such as alliances) can protect firms against uncertainties and stabilise the supply accordingly (Heide & Stump, 1995; Lee, Yeung, & Cheng, 2009). These relationships can foster both a reduction in transaction costs (Heide & Stump, 1995) and the establishment of alliances (Lee et al., 2009). According to Das and Teng (2000), low transaction costs lead to buying decisions, so activities are outsourced instead of vertically integrated. Therefore, TCT gives explanations as to whether outsourcing or vertical integration might be beneficial under certain circumstances, while outsourcing in the form of contractual relationships leads to specific relationships, such as alliances (Das & Teng, 2000).

Many studies build on TCT to explain vertical integration (e.g., Argyres, Felin, Foss, & Zenger, 2012; David & Han, 2004; Escuer, Olmos, & Martinez, 2013; Rindfleisch, 2020; Rindfleisch & Heide, 1995, 1997; Vannoni, 2002). Numerous scholars have concentrated on supporting hypotheses about the assumption that asset specificity and uncertainty are key constructs when it comes to vertical integration or boundary decisions (e.g., Lieberman, 1991; Escuer et al., 2013; Monteverde & Teece, 1982). When high uncertainty and high asset specificity occur within transactions, firms are more likely to enter into close relationship modes (such as joint ventures) (Kogut, 1991). According to several researchers, there is a positive correlation between high uncertainty and vertical integration (Fan, Huang, & Yeung, 2017). In

relation to transactions with increasing uncertainty, in the presence of high asset specificity, vertical integration might appear to be the beneficial governance mode (Hobbs, 1996; Leiblein & Miller, 2003; Poppo & Zenger, 2002).

Likewise, much support for the positive impact of high asset specificity on vertical integration has been found in empirical studies (e.g., de Souza Filho & Miranda, 2019; Joskow, 1988; Mahoney, 1992; Rindfleisch & Heide, 1997; Shelanski & Klein, 1995). Vice versa, the correlation between low asset specificities and outsourcing to the market has also been supported by several researchers (Cox, 1996; Hobbs, 1996; Parmigiani, 2007; Richardson, 1996; Walker & Weber, 1984). Furthermore, asset specificity can explain the degree of cooperation between supply chain parties within inter-firm relationships (Cox, 1996; Hobbs, 1996).

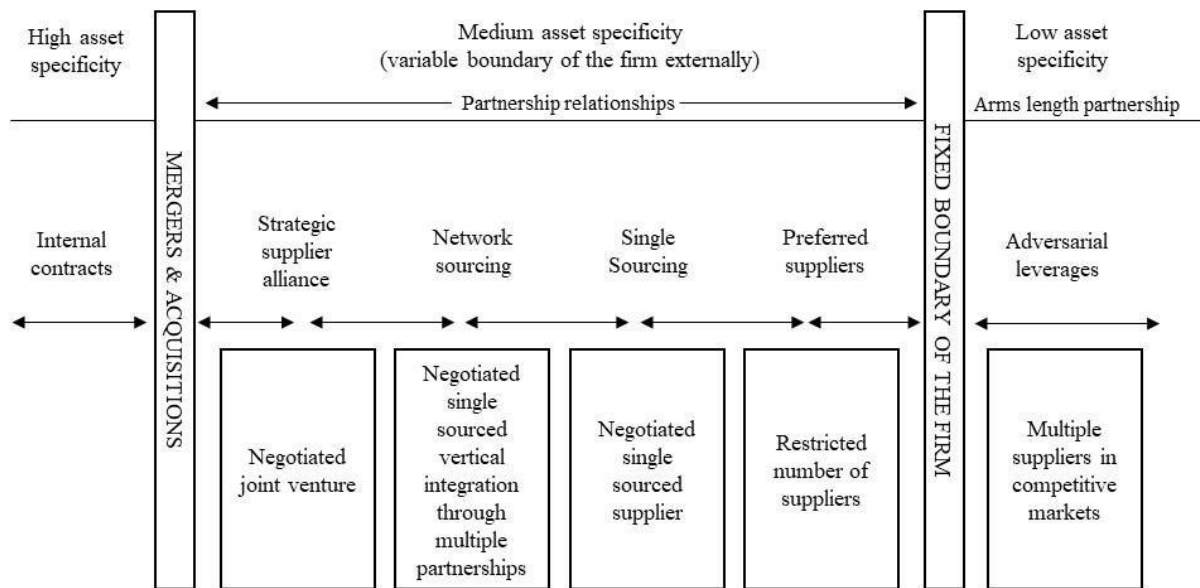
Much discussion has focused on manufacturing (e.g., Anderson & Schmittlein, 1984; Ohanian, 1994; Bigelow & Argyris, 2008; Parmigiani, 2007). Since these manufacturing-related studies lead to an emphasis on the assessment of production costs, Cox (1996) developed a less production- and cost-focussed view of asset specificity embedded in an entrepreneurial view of the firm by redefining asset specificity with regard to “fitness for purpose of skills, expertise and transactions in achieving a sustainable position for the firm in a supply and value chain” (p. 61). Therefore, not sunk costs, but the relationship of the transaction to the competitive position of the firm, is the decisive factor behind asset specificity. Highly asset-specific transactions should be kept within the company and relate to “skills and expertise that are core competences of the firm” (p. 61).

Cox (1996) concludes that firms continuously need to review their boundaries and to constantly change in response to consumer preferences. His approach to what the right boundaries and relationships are is based on asset specificity, the firm’s core competences, the reduction of transaction costs and the *raison d’être* of a firm, which he describes as the creation of profit. In this context, he defines high asset specificity as the “[...] skills and expertise that

are the core competences of the firm in sustaining their position to make profit in a market” (p. 61). Transactions with high asset specificity should be kept within the company, and these types of contracts need accordingly to be based on internal relationships. In contrast, “low asset specificity refers to those skills or expertise that are not key to success and can be outsourced to those firms that are most competitive in the market on a relatively arm’s-length basis” (p. 61). He refers to this type of external contractual relationship as adversarial leverage. Medium asset specificity refers to complementary skills or expertise that are important for the firm’s sustainability. These complementary transactions can be outsourced, whereas external contractual relationships will have different characteristics, depending on the importance of the skills and expertise to the core competence of the firm (Cox, 1996). From a supply chain perspective, these different relationship modes can be seen as vertical coordination forms; the selection of efficient governance modes can in turn be seen as a supply chain management task (Hobbs, 1996).

Cox’s approach is based on the notion that asset specificity will influence the decision on a certain contractual relationship mode and also implies that the closer medium asset-specific goods are to the core competences of a firm, the more likely it will strive for vertical integration through mergers and acquisitions. According to Cox’s model, the final stage before a firm considers a merger or acquisition is the strategic contractual form of supplier alliances (see Figure 6).

Figure 6: Continuum of asset-specific external contractual forms (Source: Cox, 1996, p. 63)



The model proposes four supplier relationship structures around medium asset-specific goods and services (Cox, 1996):

- Preferred suppliers: referring to a restricted number of suppliers that are the best at providing complementary goods or services of medium asset sensitivity, but still have relatively low strategic importance to the firm.
- Single sourcing relationships: occurring when goods or services are of increasing sensitivity to the core competencies of the firm.
- Network sourcing: multi-tiered partnership arrangements by creating a virtual company at all levels of the supply chain.
- Strategic supplier alliances: classically referred to as joint ventures.

According to the 'continuum of asset-specific external contractual forms', the probability of whether a company will merge with or acquire another depends on the asset specificity level involved. Therefore, the closer the goods or services are to the company's skills and expertise, that is, to its core competences, the more likely that it will undertake M&A.

According to Cox (1996), relationship modes, or vertical coordination forms according to Hobbs (1996), assign different governance structures to the supply chain. According to both authors, the different forms of vertical coordination range from transactions on the market to backward integration through M&A. As discussed in the previous section, asset specificity, uncertainty and frequency are important theoretical determinants that influence the design of the supply chain.

TCT thus provides explanations as to whether outsourcing or vertical integration might be beneficial under particular conditions (Das & Teng, 2000). However, the focus is not on the vertical integration of firms from a supply chain perspective, but on specific transactions. The continuum of Cox (1996) does consider M&A as a possible form of vertical coordination, but on one hand this consideration is only aimed at the determinants of asset specificity, and on the other the theoretical framework was not followed by an empirical study, which is compensated for in this thesis in order to fill the research gap.

The resource-based view of the firm is discussed in the next section as, similar to TCT, it provides explanatory approaches to a firm's boundary decisions and links to SCM. The supply chain perspective is highlighted by including the extended resource-based view (ERBV) of the firm in the discussion.

## 2.4 Resource-Based View (RBV)

In the first part of this section, the theoretical basics of the resource-based view of the firm are presented. In this context, the necessary characteristics of a firm's resources needed to achieve competitive advantage are outlined. Building on this, RBV and its extended version ERBV will be examined with regard to their suitability for the investigation of vertical integrations such as M&A, taking into account the supply chain perspective.

#### 2.4.1 RBV and SCM

From a supply chain perspective, RBV has been used in the literature to explain supplier selection (e.g., Lewis, Brandon-Jones, Slack, & Howard, 2010; Squire, Cousins, Lawson & Brown, 2009); the supplier-customer relationship (e.g., Johnson et al., 2007); and outsourcing decisions (e.g., Dekkers, 2011; Espino-Rodríguez & Padrón-Robaina, 2006; Fuller, 2018; McIvor, 2009). Scholars have also integrated RBV into transaction cost theory (Argyres & Zenger, 2012; Dekkers, 2011). It has been shown to be helpful in determining how to manage the supply chain to create competitive advantage (Hitt et al., 2016). As defined by Mentzer et al. (2001, p. 6), SCM involves "the procurement, flow and control of materials ... across multiple supplier levels". If one considers the flow of materials (and also services) as the flow of resources from the supplier to the end user, the role of SCM is to manage these resources along the supply chain to contribute to competitive advantage for companies. According to Lee (2002), a company's core capabilities lie in its ability to design and manage its supply chain to gain maximum competitive advantage (Chen, 2019). Competitive advantage cannot only be created through cost efficiency, but also through agility and innovation, as these dynamic capabilities are important for companies to maintain their competitive advantage in the global economy (Lin & Tseng, 2016; Chen, 2019).

Therefore, RBV provides a very different approach from TCT in explaining the governance mode of the firms (e.g., Barney, 1991; Foss, 1997; Hitt et al., 2016; Peteraf, 1993; Wernerfelt, 1984). Moreover, it has gained significant attention in management research and practice (Hitt et al., 2016; Priem & Butler, 2001). The resource-based view has its origin in an article by Penrose (1959), in which she states that a company is an accumulation of productive resources and grows because of its ability to employ these. However, growth can be attributed not only to a firm's ability to employ its resources, but also to the acquisition of external ones, such as through M&A (Penrose, 1959). Based on Penrose's work *The Theory of the Growth of*



*the Firm* (1959), researchers who utilise the RBV to explain questions about firms, their boundaries, and their competitive advantages emphasise the importance of their resources and competencies (e.g., Lin & Wu, 2014; Penrose, 1959; Wernerfelt, 1984). Prahalad and Hamel (1990) contributed to significant early work about RBV (Newbert, 2007). They suggest that an important management task is to design new products, and that the ability to do so is based on the core competencies of the company. In the same way as Penrose (1959), they argue that not only will static resources be in the foreground, but also the inimitable skills and knowledge of the company in which they are employed.

Barney's (1991) work *Firm resources and sustained competitive advantage* represents a comprehensive theoretical framework that provides another important context for this thesis. Barney identified the necessary characteristics of firms' resources to generate competitive advantage (Hitt et al., 2016; Hoskisson, Wan, Yiu, & Hitt, 1999; Peng, 2001; Newbert, 2007). Resources can be understood as "all assets, capabilities, organisational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (Barney, 1991, p. 10). They can create competitive advantage if they are utilised in distinctive ways (Barney, 1991).

The capabilities of a firm refer to its ability to deploy resources with the support of processes (Amit & Schoemaker, 1993; Hitt et al., 2016). They can be understood as organisation-specific, information-based, material or immaterial processes developed over time (Amit & Schoemaker, 1993), anchored in the members of the organisation and integrated in higher-order company systems (Teece et al., 1997).

Resources and capabilities, or competences, are terms often used interchangeably and represent the tangible assets, such as physical and financial ones, and intangible assets, such as reputation, knowledge and skills, used in the implementation of firms' strategies (Barney, 1991; Das & Teng, 2000; Eisenhardt & Schoonhoven, 1996).

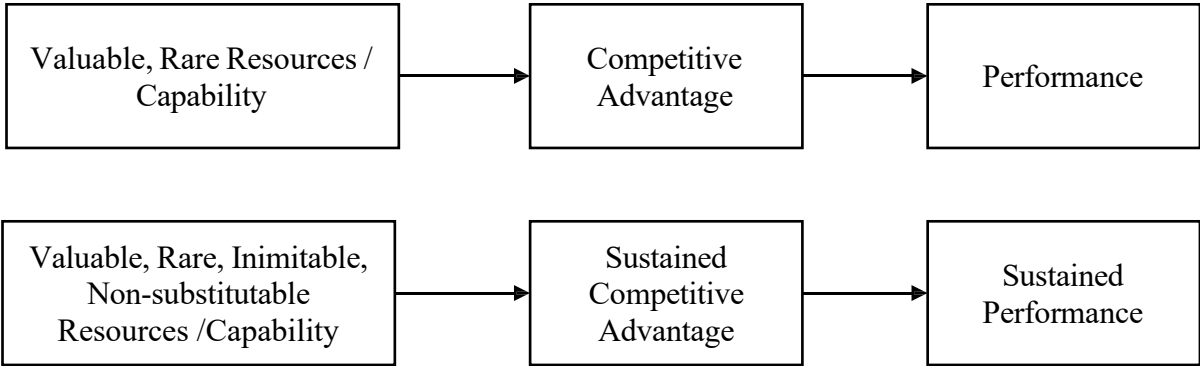
The values derived from these assets increase as firms achieve the ability to pool and deploy their resources (Das & Teng, 2000). These resources can be subdivided into physical ones (e.g., location or specialised machinery); human ones (e.g., abilities, skill and knowledge); and organisational ones (e.g., relationships, management systems and organisational culture) (Barney, 1995). These central resources are essential for firms to establish competitive advantages and unique strategies (Barney, 1991, 1995; Das & Teng, 2000; Eisenhardt & Martin, 2000; Peteraf, 1993; Schroeder et al., 2002). By combining resources, firms can differentiate themselves, exploit market advantages and realise competitive advantages (Barney, 1991).

Value-creating strategies generate such advantages, especially when there are no competitors implementing similar ones at the same time (Barney, 1991, 1995). Therefore, sustained competitive advantage appears when the resources involved are heterogeneous (Barney, 1991). This heterogeneity is determined by the complexity of imitating these resources (Dierickx & Cool, 1989); the imperfections of the resource market; the immobility of resources (Barney, 1991); and the inability of firms to change their accumulated stock of the resources over time (Carroll, 1993).

RBV emphasises the management of the determinants which become sources of economic rents and sustainable competitive advantage. The RBV theory distinguishes marginal and strategic resources based on different criteria. Strategic resources need to be valuable, rare, inimitable, and non-substitutable (VRIN) (Barney, 1991). Resources are valuable if they are capable of exploiting business opportunities or if they neutralise business threats (Barney, 1991). Firms possess rare resources if the resulting strategy implemented by them is “a value-creating strategy not simultaneously implemented by large number of other firms” (Barney, 1991, p. 106). The degree of imitability depends on how easily competing firms can replicate a valuable and rare resource of another firm. The inimitability of resources can be traced back to the historic context (e.g., a firm’s reputation or configuration of an outperforming management); casual ambiguity (e.g., the incapability of competitors to identify the sources of

competitiveness); or social complexity (the inability of competitors to imitate a firm’s culture and status) (Barney, 1991). If a firm possesses valuable and rare resources, competitors could still try to counter the resulting value-creating strategies through substitutions. Therefore, sustained competitive advantage can only be ensured if the resources are inimitable and non-substitutable (Barney, 1991).

Figure 7: Conceptual model of RBV (Source: Barney, 1991)



Firms possessing only marginal resources will at most break even, whereas those owning strategic resources will earn rents or supernormal profits (Barney, 1991; Das & Teng, 2000). In order for firms to use their resources with maximum efficiency, they must be well organised. Organisational criteria essentially include reporting structures, management control systems and compensation policies (Barney, 1991). Therefore, the resource-based view is not only a function consisting of business opportunities within the external market, but also deals with the extent to which companies can identify, develop, deploy and protect resources (Barney, 1991; Penrose, 1959; Wernerfelt, 1989).

RBV also plays an important role in supply chain management (Barney, 2012). Barney (2012) argues that SCM can be a source of competitive advantage and that while the value of resources and capabilities depends on the market within which a company operates, the rarity, ambiguity and substitutability of resources depends much more on the extent to which they are

developed under unique historical circumstances (Diericks & Cool, 1989). They are path-dependent, casually ambiguous, socially complex, intangible, invisible or complexly bundled. In relation to SCM, the question arises as to whether it can possess these attributes. Barney (2012) considers it valid to assume that it can, which would make SCM a source of competitive advantage. Although Barney also states that this ultimately requires empirical study, he holds the view that it is to be expected that supply chain management will have the kinds of attributes that can make SCM a source of competitive advantage. He also states that there are already numerous examples of SCM that support this assumption. For example, Walmart's supply chain management system is both socially complex and path-dependent and has been a source of competitive advantage for the company since the 1960s (Ghemawat, 1986). Another example is Toyota's purchasing system (as part of the SCM) as a source of competitive advantage. The system has helped the company to implement its lean manufacturing approach and has both path-dependent and tacit attributes, which have made it more difficult for other automotive manufacturers to imitate it (Iyer et al., 2009).

Further examples of the extent to which SCM itself appears to be a source of competitive advantages can be derived from the work of Bruce, Daly and Towers (2004). For example, a medium-sized British manufacturer of high-street fashion could remain competitive in a market where many small businesses have difficulties in being so. This seems to be a direct result of SCM. This manufacturer relied on a supply strategy with a mix of suppliers and producers from overseas and the UK in order to be able to react by using an appropriate mix of both in relation to short product life cycles on one hand, and to rapid product replenishment on the other. Another example refers to a small start-up (sportswear accessory design) based in Great Britain and Europe. In this case too, the supply chain strategy serves as an important capability for competitiveness. The start-up company has also established a mixed supplier base in the UK and abroad in order to be able to exploit the cost advantages of foreign suppliers and the delivery speed of UK ones.

Therefore, while many SCM studies focus on material flow, it is advantageous to take a closer look at the supply chain itself (Ketchen & Giunipero, 2004). If supply chain practices can also be valuable, rare, inimitable and non-substitutable, supply chain management can create competitive advantages for firms according to RBV logic (Ketchen & Giunipero, 2004). For example, the study by Hult, Ketchen and Nichols (2002) investigated this question and found that cultural competitiveness, “i.e. the degree to which chain members dedicate themselves to closing gaps between what customers get and what customers want” (Ketchen & Giunipero, 2004, p. 53), can bring competitive advantage, since there is a connection to the cycle time of order processing.

Another relationship between SCM and RBV can be seen in the management of resources within firms and the resource flows from suppliers to them (Hitt, 2011). According to Sirmon, Hitt and Ireland (2007), one management task is to orchestrate resources in a way that creates competitive advantages for firms, so that the management of resources is seen as just as important as the presence of resources. They refer in this context to the structuring of the resource portfolio, which includes the procurement, development and disposal of resources. In order to obtain competitive advantage, strategic resources can thus not only be held, but they must be used effectively and bundled, so that they constitute advantages for the firm in the market (Sirmon, Hitt, Ireland, & Gilbert 2011). The management of resources may depend both on the quality of the resources held and on the processes used to manage them (Holcomb, Holmes & Connelly, 2009). From a supply chain perspective, many materials and services are procured through suppliers in addition to the resources created in-house. Suppliers play a decisive role in creating competitive advantage, because resources procured externally must be managed effectively (Hitt, 2011).

According to Hitt (2011), it is easier to manage internal resources than to effectively use and bundle external ones. From the SCM perspective, the relationship between the resource-procuring firm and resource-providing suppliers plays a particularly important role (Hitt, 2011).

Resources can be obtained through hybrid governance modes in the form of inter-firm relations and cooperation (Das & Teng, 2000; Dyer & Singh, 1998; Grant & Baden-Fuller, 2004) by means of contracts (Barney 1999; Gainey & Klaas 2003; Grant 1991).

From the RBV perspective, firms grow by including activities that are related to existing ones (e.g., Barney, 1991; Gancarczyk, 2016; Nason & Wiklund, 2018; Winter, 1988). Winter (1988, p. 176) argues that “when a firm grows by vertical integration, it is not just a question of ‘more of the same’. But it is more of something closely related, something about which the firm already has some degree of relevant knowledge.” In the context of the proposed study of this thesis, the general assumption is made that, from the RBV perspective, a firm might strive for vertical integration through M&A to achieve competitive advantage and to develop the chance of gaining appropriate economic rents or to assure rare, difficult to imitate and costly resources (Barney, 2002).

SCM itself as a resource might create competitive advantage (Barney, 2012), but this does not provide any insight into the extent to which the resources of a firm and its suppliers influence vertical coordination. One supply chain management task is to orchestrate resources in a way that creates competitive advantage for firms (Sirmon, Hitt, & Ireland, 2007). To fulfil this task, it is important to understand how resources influence different governance modes and then to understand which determinants have an impact on backward integration through M&A from the RBV perspective. This study attempts to close this apparent research gap. The discussion on vertical integration in connection with RBV is further deepened in the section 2.4.3 on RBV, ERBV and Boundary Decisions.

The following section presents the extended resource-based view (ERBV), which provides further insight into the supply chain as a source of competitive advantage through the use of external resources and serves as an extension to this work to aid understanding of the impact of these external resources on the generation of competitive advantage.

#### 2.4.2 Extended Resource-Based View (ERBV) and SCM

As summarised by Kotzab et al. (2015), supply chains are vertical networks of independent companies (Brass et al. 2004; Choi and Wu 2009), within which there is a drive to maximise synergies and efficiency and to develop resources and competencies, as well as to acquire resources that they would not be able to acquire themselves without being part of the network (Boute, Van Dierdonck, & Vereecke 2011; Alfalla-Luque, Medina-Lopez, & Dey 2013). While various researchers (e.g., Afuah, 2000; Das and Teng, 2000) criticise RBV for assuming that only resources tied up in the firm can create competitive advantages, ERBV explicitly deals with the creation of competitive advantages through resources and capabilities which are outside the firm's boundaries (Ali & Abou, 2021; Cao & Zhang, 2011, Lewis, 2000; Squire et al., 2009; Park, Lee, & Koo, 2017; Yang, et al., 2019). ERBV may be able to explain the achievement of a firm's competitive advantages more holistically than the conventional RBV (Park, 2007). Since many strategic resources are owned by suppliers, it is not a matter of possessing the resources, but of the interaction between firms and their external environment, which can generate competitive advantages (Lewis, 2000).

If one considers suppliers as a source of resources and capabilities that are outside the firm's boundaries and are a virtual extension of the supply chain (Gandhi et al. 2017; Mason, 1996; Copacino, 1996), this virtual extension may also serve as a source of competitive advantage through external resources. ERBV is concerned with the creation of competitive advantages within the framework of integrated operations (Lavie, 2006). Along the continuum of vertical coordination (Hobbs, 1996; Cox, 1996), vertical integration through M&A represents the final stage of interconnection. Against the background of ERBV logic, M&A can function as an instrument for extending the actual supply chain and thus be an extension of the virtual supply chain, therefore representing an opportunity to gain strategic resources and competitive advantages.

ERBV sees firms as a form of governance that can access a broad range of external resources through “both market-mediated transactions and through various kinds of resource exchange and resource leverage relations that link firms in value chains that criss-cross the economy” (Mathews, 2003, p. 117). A firm’s strategic capabilities are therefore also a consequence of its integration into a broader network of exchange relationships (Squire et al., 2009), which means that it must integrate both external and internal resources in order to develop its own organisational capabilities (Lai, Zhang, Lee, & Zhao 2012). While sustainable competitive advantage is generated by strategic resources, whether external or internal, the development of internal capabilities can also be used to improve a firm’s ability to absorb external resources (Lai et al., 2012).

Based on the ERBV approach, Lewis et al. (2010) provide examples that support this view. For example, Dyer and Nobeoka (2000) explained that Toyota has primarily been able to create competitive advantages through its supplier relationships, rather than through the existence of strategic resources. Another example comes from the aviation industry, where competitive advantage was created by extending reservation systems in travel agencies, which represents a resource-based competitive advantage beyond firms’ boundaries (Duliba, Kauffman, & Lucas, 2001). A study by Squire et al. (2009) supports ERBV logic, in that they find a strong correlation between supplier capabilities, supply chain collaboration and buyer performance.

Firms strive to build close relationships with both upstream and downstream firms within the supply chain to succeed in the competitive environment and build competitive advantages through collaborations with these supply chain partners (Xu & Huo, 2014). ERBV has explicit links to supply chain literature in relation to researching suitable levels of collaboration between supply chain participants (Lewis, 2000), in particular the development of appropriate buyer-supplier relationships (Croom et al., 2000). According to ERBV, accessibility to external resources is achieved precisely through the existence of certain forms



of cooperation between companies within the supply chain (Ireland et al., 2002, Rungtusanatham, Salvador, Forza, & Choi, 2003). Lewis et al. (2000) provide examples in which this context has been examined. Rungtusanatham et al. (2003), for example, argue with reference to their conceptual framework that competitive advantages can be generated by supply chain connections. In addition, a study by Wilk and Fensterseifer (2003) suggests that firms' competitiveness relies on both individual resources and those which are shared within supply chains.

M&A can therefore serve to internalise and gain control over a certain part of the supply chain in order to improve the initially external and subsequently internal capabilities to the extent that they can be better used to exploit external resources. These external resources can then be provided by suppliers, which in turn can be understood as a virtual extension of the supply chain.

One aspect of supply chain management can therefore be seen as establishing and improving abilities for the efficient use of external resources as a possible source of competitive advantage. In addition, it is important to find the right governance form that is best suited to fully exploiting the competitive advantages of strategic external resources. One of these governance forms can be represented by the vertical integration of supply chain links through M&A. Even though ERBV seems to provide promising approaches for governance studies in the supply chain, related investigation has yet to be presented in the literature, leaving a research gap which is tackled in this study.

The following section discusses RBV and ERBV with regard to their applicability to boundary decisions taken by companies in due consideration of the supply chain perspective.

### 2.4.3 RBV, ERBV and Boundary Decisions

According to Barney (1999), there are three options for gaining access to the resources and capabilities a firm needs to succeed. First, it can cooperate with other firms that have them. This can be achieved through both intermediate governance and market transactions. Second, the firm can develop these resources and capabilities itself within its hierarchical governance structure. Third, it can acquire (or merge with) another firm and transfer its resources and capabilities into its own hierarchical governance structure. Therefore, what determinants can lead to M&A and consequently to a situation in which the combination of resources of firms is economically beneficial?

In the context of resource combination, both the similarity and complementarity of resources play a role in achieving economic benefits (Tanriverdi & Venkatraman, 2005). Some researchers have pointed out that a high degree of business relatedness positively correlates with acquisitions and alliances as beneficial forms of governance (e.g., Dyer and Singh, 1998; Stuart, 2000). The findings of Wang and Zajac (2007) indicate that higher resource similarity between two firms leads firms to choose acquisitions as a governance form of resource aggregation over alliances, while high complementarity of resources will lead firms to choose alliances rather than acquisitions.

Capability concepts have been directly applied to explain the determinants of firm boundaries (e.g., Langlois, 1992; Barney, 1999). Firms control internally comparative capabilities and outsource access to these when other firms have less expertise (Argyres & Zenger, 2012). According to Barney (1999), some firms are simply better at certain things than others, so the capabilities of a firm and its potential partners have a significant impact on boundary decisions.

According to Richardson (1972), before integrating a new activity, a company must assess the extent to which it can use similar and existing knowledge, experience and

capabilities, as these factors are necessary to undertake new activities within the company's boundaries and at the same time achieve comparative advantages. Other firms can perform such activities more efficiently if they do not offer similar knowledge, experience and skills. In order to understand whether to perform a new activity within a firm's boundaries or not, it needs to evaluate the 'closeness to the present competence' (Gulbrandsen, Sandvik, & Haugland, 2009).

This can be described as "the degree of similarity between the firm's present pool of competence and new competence needed to perform the activities bought from the supplier" (Gulbrandsen et al., 2009, p. 91). Firms have the tendency to expand their boundaries towards those fields where their present capabilities can be used to create new value and gain comparative advantage accordingly (Richardson, 1972; Winter, 1988). Accordingly, firms may grow through vertical integration (through M&A) by complementing their resources and capabilities with others that are closely related (Winter, 1988) to their existing knowledge, experience and skills (Richardson, 1972). Similarly, Poppo and Zenger (2002) support the correlation between capability sets and vertical integration.

In addition, according to Tanriverdi and Venkatraman (2005) the economic advantages resulting from the combination of resources are usually due to the similarity as well as the complementarity of the resources of the operating companies. Earlier research has already shown that a high degree of business relatedness is advantageous for firms in the case of acquisitions and alliances (Datta & Puia, 1995; Mowery et al., 1996; Dyer & Singh, 1998; Seth, 1990; Sohl & Vroom, 2017; Stuart, 2000). In addition, when two firms have a high degree of similarity in their businesses, there is less information asymmetry, which makes it easier to assess the assets and capabilities of the potential target. This leads to the conclusion that the greater the similarity between two companies, the more likely they are to pool their resources through an acquisition (Wang & Zajac, 2007).

The discussion about competencies within the framework of the RBV theory, especially that about the core competencies of a firm, also provides important approaches for insourcing

or outsourcing decisions (Fuller, 2018; Gilley & Rasheed 2000). Core competences can be understood as those activities which contribute to the growth and direction of a firm (Peteraf, 1993). Therefore, firms should invest in activities which create core competences and organise other activities via the market (Prahalad & Hamel 1990; Quinn & Hilmer 1994). In addition, they should not only create such competencies, but also introduce systems to protect them (Quinn, 1999). According to Argyres (1996), outsourcing is appropriate when a firm has lower competencies for a particular activity than others in the market; that is, in a situation where suppliers possess better capabilities for this activity. However, this does not apply when higher costs are accepted in the short run while capabilities are being generated internally (Argyres, 1996).

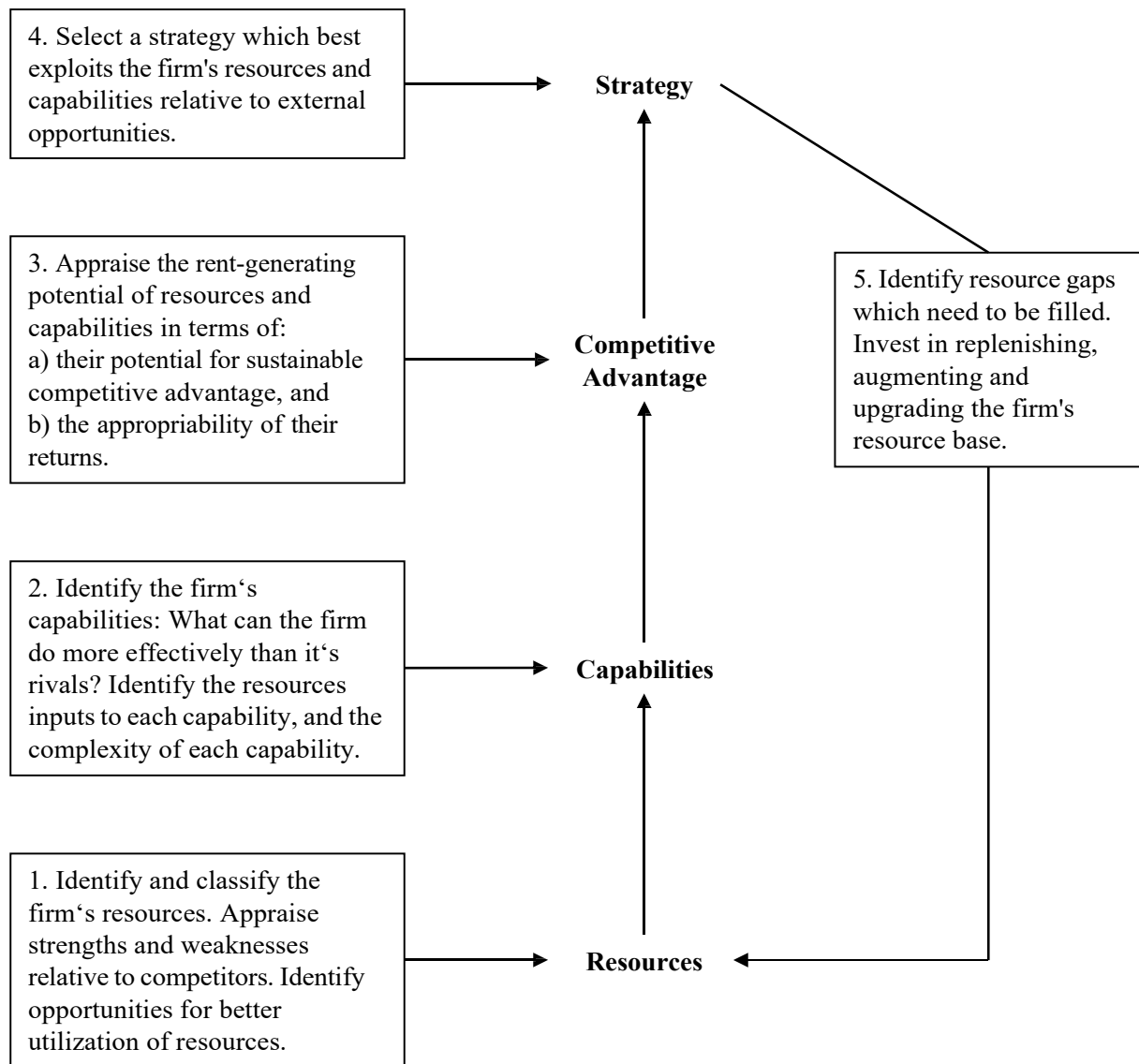
Prahalad and Hamel (1990) state that long-term competitive advantage originates from the core competences of a firm, while short-term competitiveness can be traced to pricing and product-specific characteristics. Accordingly, a firm's strategy should rest upon focusing on those resources providing the core competences (Prahalad & Hamel, 1990). Therefore, decisions about the effective boundaries of a firm greatly depend on a profound understanding of these core competences, which again can be understood as the source of a firm's competitive advantage (Bettis, Bradley, & Hamel, 1992). Such competences can be understood as the capabilities, abilities and systems enabling a firm to perform activities better than its competitors, enabling them to be world-beating while providing their customers with high value (Quinn & Hilmer, 1994).

Since a company is not constrained by its own stock of resources and capabilities (Barney, 1999; Cheon et al., 1995), according to Grant (1991) it must decide whether to develop resources internally or acquire them through the market. Therefore, if firms concentrate on resources that generate competitive advantages (Prahalad & Hamel, 1990), that is, core competences, then such resources could be gained from the supply chain perspective through M&A; for example, by internalising suppliers up the supply chain through vertical integration.

A lack of resources can also be complemented by purchases or strategic alliances in order to better utilise existing resources and capabilities (Grant, 1991).

The framework developed by Grant (1991) is relevant in this context. According to it, the formulation of strategies is based on the resources and capabilities of a firm. The framework consists of five phases which link strategy, competitive advantage, resources and capabilities. The fifth phase involves identifying the resource gaps that need to be filled by investing to replenish, expand and improve a company's resource base (see Figure 8).

Figure 8: A resource-based approach to strategy analysis (Source: Grant 1991, p.115)



According to Grant (1991), the need to create resources is thus based on the lack of existing resources and capabilities. In this context, firms have the choice to either develop resources internally or acquire them externally (Grant, 1991). Therefore, in order to ultimately develop a strategy that leads to competitive advantage through the combination of existing resources and capabilities, it may be necessary to acquire complementary resources externally (Teng et al., 1995), such as through purchases or strategic alliances Grant (1991).

According to the resource-based approach to strategy analysis, a firm must first evaluate the resources that sustain its activities before it makes a decision on the acquisition of external resources (Grant, 1991). Competitive advantages result from the possession of valuable resources which enable companies to undertake their activities better or more cheaply than their competitors (Collis & Montgomery 1995). As explained earlier, according to Barney (1991), resources must have certain characteristics in order to generate sustained competitive advantage, namely the VRIN criteria (valuable, rare, imperfectly imitable, non-substitutable).

In the same vein, Grant (1991) emphasises that the valuable resources and capabilities of a firm are those which are difficult to identify, not easy to understand, imperfectly transferable, difficult to replicate, and over which the firm has control and possesses ownership. In order to realise competitive advantages, a continuous heterogeneity of resources plays an important role, ensuring that such advantages are not only short-lived but sustainable, because otherwise the competition could replicate or substitute these resources (Barney, 1991; Grant, 1991; Peteraf, 1993).

Ultimately, the resources of a firm should benefit customers (Hamel & Prahalad, 1994). This means that the higher the quality of the benefit perceived by the customer, the more valuable the resources are (Lepak & Snell, 1998) and the more likely the activities sustained by those resources will be performed in-house (Saunders et al., 1997).

Valuable resources owned by a large number of firms do not lead to competitive advantages, because to differing degrees the resources are able to generate competitive advantages depending on whether they are rare or not (Barney, 1991). Espino-Rodríguez & Padrón-Robaina (2006) developed this theory and derived the following propositions.

Proposition 1: “The more valuable and specific (heterogeneous) the resources and capabilities of an activity or business process, the less it [*sic*] will be outsourced” (Espino-Rodríguez & Padrón-Robaina, 2006). Conversely, if one turns this proposition around, it could also be formulated that the more valuable and specific (or rare) the resources and capabilities

of an activity or business process, the more likely they will be insourced; for example, through mergers or acquisitions.

According to Petergraf (1993), resources become a source of competitive advantage when so-called ex post restrictions exist, which is the case when the resources are not only valuable but also inimitable and not substitutable by competitors. The ease with which a competitor can imitate or substitute valuable resources therefore influences the durability of the competitive advantage (Espino-Rodríguez & Padrón-Robaina, 2006).

From an outsourcing perspective, Espino-Rodríguez & Padrón-Robaina conclude that those activities that can be outsourced are based on easily replicable or substitutable resources (Espino-Rodríguez & Padrón-Robaina, 2006, p. 62) or can be performed by a supplier equally well or better than by the firm itself (Barney, 1999). Based on the previous discussion, Espino-Rodríguez & Padrón-Robaina (2006) elaborated a further proposition.

Proposition 2: “The more non-substitutable and inimitable are the resources and capabilities inherent to an activity or business process, the less it [*sic*] will be outsourced” (Espino-Rodríguez & Padrón-Robaina, 2006, p. 62). As with the first proposition, the same applies here: if one turns the proposition around, it could also be argued that the more non-substitutable and inimitable the resources and capabilities inherent to an activity or business process are, the more likely they will be insourced; for example, through mergers or acquisitions.

To date, no empirical study has been conducted that empirically tests the influence of resources with VRIN criteria on governance forms within the supply chain in relation to supplier-customer relationships, let alone with respect to backward integration in particular. This research gap will to some extent be closed within the framework of this study.

From the supply chain perspective, the question arises as to which types of collaboration are the most efficient in enabling access to external resources, and what the circumstances under which vertical integration through M&A represents an appropriate form of governance are. As



already described in the section 2.2.2 on the Determinants of Mergers and Acquisitions, from the RBV point of view the motivation for M&A can be seen in the acquisition of strategic assets (Deng, 2009). These are assets that serve to realise competitive advantages (Amit & Schoemaker, 1993). From the RBV perspective, firms strive to improve their critical core competencies (Child & Rodrigues, 2005, Luo & Tung, 2007). According to some authors (Gulbrandsen et al., 2009, Richardson, 1972, Winter, 1988), closeness to the present resources and capabilities plays a decisive role in vertical integration. Against this background, a firm might acquire complementary resources outside its boundaries to create and/or maintain competitive advantage (Teng et al., 1995); M&A can be used as an instrument to expand the supply chain and internalise strategic assets and resources accordingly.

According to ERBV, many strategic resources are owned by external suppliers, and competitive advantage can be achieved not only by using and combining strategic resources within a firm's boundaries, but also by leveraging them outside the firm's boundaries (Ali & Abou, 2021; Cao & Zhang, 2011, Lewis, 2000; Squire, Cousins, Lawson, & Brown, 2009; Park et al., 2017; Yang et al., 2019). Therefore, if strategic resources are available outside the firm, they could also be obtained through interconnected companies (Lavie, 2006) or acquisitions (Barney, 1999), in which the similarity of skills and resources plays an important role (Gulbrandsen et al., 2009; Richardson, 1972; Winter, 1988).

From the RBV point of view, an acquisition represents an opportunity to create further competitive advantages by combining internal resources (Barney, 2009). On the other hand, from the ERBV perspective, the expansion of the supply chain, for example based on M&A, will then again provide the opportunity to generate further competitive advantages through new strategic resources outside the firm's boundaries (as the previous external resources would then be internalised through M&A) (Lavie, 2006). By expanding the supply chain through backward integration through M&A, opportunities could thus be created from both the RBV and ERBV perspectives to develop further competitive advantages through both internally and externally

generated resources. It should also be pointed out that Barney (2012) sees SCM itself as a capability. Therefore, not only does the extension of the supply chain offer possibilities for the generation of competitive advantage, but also the acquired SCM itself.

In the following chapter, the interrelationships and critical points of RBV, ERBV and TCT are outlined in order to discuss whether the existing criticisms are relevant to the present work and to highlight the overlaps between the theories.

## 2.5 RBV, ERBV and TCT: Criticism and Relationship

TCT and (E)RBV are very different in nature, as RBV considers the firm as the basis for competitive advantage, while TCT understands it as a construct operating in a cost-driven environment (Ellram et al., 2008). According to Hobbs (1996), transaction costs and their reduction are the focus of interest in supply chain management in order to ultimately gain competitive advantages. Firms aligning their strategy towards an RBV perspective tend to understand their competitive advantage as coming from differentiation in the market, whereas 'TCT firms' would tend to derive such advantage from a cost-driven strategy (Cousins, 2005). Examples of the criticism of TCT and RBV and the relationships between the theories are presented below.

### 2.5.1 Criticism of TCT

TCT is a useful theory for providing explanatory approaches to both vertical integration (through M&A) and supply chain management. Nevertheless, it is also important to consider the critical voices regarding it in order to be able to deal with them accordingly. Some of the criticisms are therefore briefly outlined below.

TCT has been criticised for devoting too little attention to the value creation process (e.g. Madhok, 2002) and for not giving indications as to which transactions a firm should seek if it is to create value (Argyres, 2012). Argyres states that “after all, there are numerous specific or cospecialized investments that would generate unique assets or activities and that would require governance safeguards to motivate and generate” (p. 1646). Nevertheless, only a few of these specific investments are able to create sustainable competitive advantage for a firm, therefore the choice of its boundaries cannot be made entirely dependent on the specificity of assets, but “must also be shaped by assessments of the value created by alternative asset combinations” (Argyres, 2012, p. 1646). RBV does not either specify which transactions should be pursued, but this is not the subject of this thesis. It does make sense, however, for the thesis to take the RBV perspective into account and thus consider the competitive advantage generated through the combination of resources as an influencing factor on a firm’s boundary decisions. This point of criticism is thus tackled by also adopting the RBV perspective.

Langlois (1992) states that the internal ability of the firm to learn generates long-term cost advantages which are not considered in the theory’s short-term view. Ghoshal and Moran (1996) state that the firm is also an organisation in which human capabilities can be used to cooperate, learn and take initiatives. The firm “also may rely on exploiting the organization’s internalized purpose and diversity to enhance both learning and its use in creating innovations and purposive adaptation” (Ghoshal & Moran, 1996, p. 46). The RBV perspective can be used as a supplement in this context. According to Barney (1991), the firm is an organisation in which competitive advantage can be created through the combination of human resources and capabilities, such as knowledge. In this context, acquisitions can even be seen as innovation accelerators from the RBV perspective (Hitt et al., 1990).

Although the TCT appears to be a useful basis for assessing the choice of the right boundaries for a firm, the theory cannot be used to assess the performance of a firm’s different

governance modes (Poppo & Zenger, 1998). However, this aspect is not critical for the thesis as performance evaluation is not an object of investigation.

According to Prahalad and Hamel (1990), TCT's cost-oriented focus prevents companies from recognising the need to focus on their core competencies and preserve strategic resources. In this context, this thesis relies on the work of Cox (1996), who defines high asset specificity as "[...] skills and expertise that are the core competences of the firm in sustaining their position to make profit in a market" (p. 61), thereby mitigating this criticism.

Wagner and Frankel (2000) also stress that the focus should not only be on cost savings. Instead, the aim must be to develop strategic long-term relationships and partnerships. However, for this thesis this point is non-critical for the research project, since, according to other researchers (e.g. Cox, 1996; Hobbs, 1996), one does not exclude the other, as TCT provides explanations for different forms of relationships and partnerships. These range from market transactions to strategic partnerships, such as strategic alliances and joint ventures to vertical integration (Cox, 1996; Hobbs, 1996).

Despite all the points of criticism, TCT remains a guiding theory in relation to boundary decisions, which is reflected in the fact that many researchers respect it as valid and have used it as a basis for studying vertical integration, often with asset specificity and uncertainty at the centre of their research (e.g. Argyres, Felin, Foss, & Zenger, 2012; David & Han, 2004; Escuer, Olmos, & Martinez, 2013; Monteverde & Teece, 1982; Parmigiani 2007; Vannoni, 2002). Hodgson (1998) suggests that the use of both theories can lead to mutual weaknesses being mitigated. In order to counteract some of the points of criticism, this thesis will also take a resource-oriented perspective by using not only TCT-based argumentation, but also the (E)RBV theory, criticism of which is discussed in the following section.

### 2.5.2 Criticism of (E)RBV

Although RBV is a valid theoretical approach to providing a basis for both vertical integration (through M&A) and supply chain management, it has also been criticised by researchers.

First, this refers to its lack of economic implications and operational practicability (Priem & Butler, 2001a). In this context, RBV specifies that VRIN resources should be created and a suitable organisation established, but it does not show how this should be achieved (Connor, 2002). This aspect is not critical for this work, since the correct configuration of a suitable company is not the focus of the investigation, but rather its form of governance, in particular vertical integration through M&A.

Second, it has been claimed that RBV underestimates property rights issues and at the same time overestimates the total control of the resources to be managed (McGuinness & Morgan, 2000). The study of the circumstances under which the control of resources through backward integration through M&A is appropriate is one of the subjects of this thesis. By including ERBV, this point of criticism regarding total control can be mitigated, since ERBV does not assume that only controlled resources can bring competitive advantages.

Third, most researchers use a diverse set of different key competences and resources, making it difficult to systematically compare research results in the literature (Lockett et al., 2009). This is further reinforced by the fact that influential works on RBV are based on different analytical units. In particular, the definitions of resources vary widely. According to Wernerfelt (1984), the term “resources” can cover anything that can be understood as a strength or weakness of a company, so that “a firm’s resources at a given time could be defined as those (tangible and intangible) assets which are tied semi-permanently to the firm” (p. 172). Barney (1991), on the other hand, as already mentioned in the section 2.4.1 on RBV and SCM, defines resources as strategy-relevant determinants for improving efficiency and effectiveness. Amit

and Schoemaker (1993) formulated an even more general definition: “The firm’s resources will be defined as stocks of available factors that are owned or controlled by the firm” (p. 35). These three definitions alone underline that the definitions of resources in RBV are very comprehensive and therefore there is no entirely clear definition (Priem & Butler, 2001).

According to Kraaijenbrink, Spender and Groen (2010), these generally formulated and comprehensive definitions of resources are problematic in two respects. First, they do not represent a sufficient distinction between the resources which are inputs into firms and the capabilities which enable them to choose, use and organise such inputs. This fact ultimately leads to different starting positions in the use of RBV in research projects (Kraaijenbrink et al., 2010). In this thesis, the definition from the section on RBV and SCM of Barney (1991) is assumed to be a valid definition for this thesis, with resources understood as “all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness” (Barney, 1991, p. 10). Therefore, for this work there is at least comparability with regard to those academic works which have also chosen this definition as a basis.

Fourth, RBV does not explain how different types of resources can contribute in different ways to creating competitive advantages (Kraaijenbrink et al., 2010), as it treats these different types (Barney, 1991) in the same way. According to Barney and Clark (2007), this distinction is not necessary for the validity of the RBV theory. However, Kraaijenbrink et al. (2010) suggest that the theory could be improved “if its basic logic would be refined by explicitly recognizing differences between types of resources – static, dynamic; tangible, intangible; financial, human, technological; deployed, in reserve; perishable, non-perishable; and so on – and between types of resource ownership”. This thesis agrees with the view of Barney and Clark (2007) and considers the theory valid, although a more decisive specification of resources could lead to a possible improvement through a more precise definition.

The fifth criticism is the heterogeneity discussed by RBV. According to Foss and Foss (2004), this heterogeneity has been little researched, which appears problematic in view of the centrality of this criterion in RBV. Furthermore, according to Gibbert (2006), the resource uniqueness resulting from the fusion of heterogeneity and immobility, as discussed in RBV, represents a limiting factor with regard to possible generalisations. Since RBV does not contain law-like generalisations that can be expected from a theory, widespread criticism assumes that it represents a tautology that does not meet the criteria for a true theory (Lockett, Thompson, & Morgenstern, 2009). RBV includes methodological obstacles involved in the drafting and testing of direct hypotheses (Priem & Butler, 2001a) because, in order to test its direct hypotheses, the relevant resources must be identified and measured. The vast majority of resources are directly related to organisational learning; therefore, their measurement can be problematic (Priem & Butler, 2001b). This point is considered in the thesis. The aim is not to test the theory itself, but rather to use it, which is considered to be a valid approach and as a basis for the development of the hypotheses to be tested.

Sixth, a further point of criticism is that by assuming that only tied, endogenous resources increase competitive advantage, RBV tends to ignore exogenous factors, in particular resources outside the firm's boundaries, which could be relevant for creating competitive advantages (Afuah, 2000; Das & Teng, 2000).

In summary, and due to the fact that ERBV is based on RBV, most of the points of criticism mentioned above can also be applied to ERBV, with the exception of the last one. In relation to such criticism, ERBV can be seen as a positive enhancement which overcomes it. Since ERBV is still a relatively recent development (Lewis et al., 2010), there are apparently no ERBV-specific points of criticism to be found in the literature. It can be assumed that the core of ERBV, namely that competitive advantages can also be achieved through external resources, would be criticised by the proponents of the classic RBV, since they assume that competitive advantages can only be achieved through bound resources.

Despite the criticism mentioned above, (E)RVB is considered to be a valid theory for this thesis, as shown above all by the fact that many researchers have used it as a basis for explaining both vertical integration (Child & Rodrigues, 2005; Barney, 2012; Gulbrandsen et al., 2009; Luo & Tung 2007; Richardson, 1972, Winter, 1988) and supply chain management (Barney, 2012; Hit, 2011). In addition, the criticism discussed here does not pose a threat to the research project, as explained in this chapter. ERBV is a very useful supplement in this context, as it overcomes the criticism that only controlled and tied resources bring competitive advantages (Lewis et al., 2000).

The following section gives a brief comparative overview of the two theoretical approaches and emphasises some commonalities, once again underscoring the value of using both theoretical strands.

### 2.5.3 Relationship between (E)RBV and TCT

TCT and RBV have been shown to be very different in nature (see Table 1), particularly when applied to SCM and M&A. While RBV sees the firm as the basis for competitive advantages through resource combination and exploitation, TCT defines it as a construct operating in a cost-oriented environment, where the emphasis is on the role of efficient governance, and firms are declared to be institutions for the organisation of economic action (Ellram et al., 2008).



Table 1: Two views of SCM: competence and efficiency (adapted from Ketokivi and Mahoney, 2020)

<b>Theoretical foundation</b>	Resource-based view	Transaction cost theory
<b>Key question</b>	Who is the most competent actor to perform the given supply chain task?	How are transactions in the supply chain organised in a cost-efficient way?
<b>Prominent authors</b>	Barney (1991)	Williamson (1975, 1985, 1996)
<b>Central dependent variable</b>	Firms' competitive advantage	Economic efficiency of the transaction
<b>Unit of analysis</b>	Firm's resources	Inter- and intra-organisational transactions

As can be seen in Table 1, the two theories differ in their supply chain-related key questions, their theoretical foundation, and the variables to be examined. The two theoretical approaches are therefore explained in most academic papers as independent, competing positions to explain the boundaries of firms (Argyres & Zenger, 2012). From the point of view of TCT, vertical integration represents a beneficial form of governance if the costs of transactions within the market are higher than if they were conducted within the firm, while the boundaries of a firm within RBV theory are determined by the extent to which a firm can perform an activity based on its own resources better than the market could (Argyres & Zenger, 2012; Barney, 1991; Conner, 1991). Furthermore, firms aligning their strategy with an RBV perspective tend to understand their competitive advantage as coming from differentiation in the market, whereas TCT firms tend to derive such advantage from a cost-driven strategy (Cousins, 2005).

Carter and Hodgson (2006) state that most empirical studies on firm boundaries based on TCT can be described as consistent if they also take a resource- or competence-based perspective into account. This is due to the complementary aspects of both theories. While in

TCT hierarchy is understood to be a governance mode to overcome market failures, from the RVB perspective it is also seen as a governance mode that creates capabilities. The reason why an activity is performed within the firm's boundaries is not only due to market failure and transaction costs, but is also based on the success of the firm derived from competitive advantages as a result of the combination of resources.

The complementarity of the theories is also represented in relation to asset specificity. Strategic resources or competences can be interpreted as asset-specific (Cox, 1996). As discussed in Chapter 2.3.2, Cox (1996) defines asset specificity as the “skills and expertise that are core competences of the firm” (p.61). In addition, within TCT-related research, highly asset-specific investments are regarded as crucial firm-specific resources for the creation and maintenance of strategic advantage (Williamson, 1981; Zhao, Luo & Suh, 2004). Firm-specific investments with high asset specificity have little to no value outside the transaction (Klein, Crawford, & Alchian, 1978; Williamson, 1981) and they are, like strategic resources, difficult to market or imitate (Combs & Ketchen 1999). According to Combs and Ketchen, this complementary aspect explains why the high performance of firms can be explained either from a TCT perspective as a product of efficiency-oriented organisational management, or from an RBV perspective based on strategic resource exploration.

There is another complementary aspect regarding resources. While RBV attempts to answer the question of which resources complement each other in generating competitive advantages, TCT deals with the question of which governance structure should be used to manage these resources after their identification (Combs & Ketchen, 1999). Argyres and Zenger (2012) also explain the intertwining of the two theories in the following way, that the distribution of resources depends on decisions firms have to make to develop or acquire internal competencies. Argyres and Zenger argue that these decisions are probably based on the choice of different governance modes and/or transaction cost considerations.

Against this background, TCT and RBV have already been used jointly to evaluate strategic-level purchasing, buyer-supplier relationships and boundary decision topics (e.g., Das & Teng, 2000, Cousins, 2005; Monios & Bergqvist, 2016; Neves, Hamacher, & Scavarda, 2014; Wagner, 2006). This thesis will therefore also use both theoretical perspectives to study the determinants of vertical backward integration and thus take into account their complementarity in mitigating their shortcomings. The relations between RBV and TCT discussed here can also be projected onto ERBV, as this theory is based on RBV. ERBV is an extension of RBV, which, as already pointed out, can also contribute to mitigating some of the criticism of RBV.

## 2.6 Key Literature Overview

Table 2 provides an overview of the key points of the most relevant literature, including its authors, key features and key findings. In addition, the table briefly highlights the relevant research gaps addressed by this study.

Table 2: Key literature (Source: Author)

Author	Research characteristics	Key findings - contribution to this study	Addressed research gap
Cox, 1996	This paper addresses strategic supply management as part of an effective corporate strategy. According to Cox, companies must recognise that corporate boundaries must constantly adapt to consumer preferences. In this context, the types of relationship competencies and their analysis represent an important factor in determining effective corporate boundaries. The discussion considers the competencies, relationships, and asset specificity upon which to create a supply chain that lowers transaction costs and improves profitability.	Cox developed a distinct definition of asset specificity, defining it as the "skills and expertise that are core competencies for maintaining position and making profits." He focuses on asset specificity and vertical coordination and developed a theoretical continuum of asset-specific external contract forms. The paper explicitly mentions mergers and acquisitions as a possible form of vertical integration depending on the degree of asset specificity; the likelihood of a firm merging with or acquiring another firm depends on the degree of asset specificity.	The continuum of asset-specific external contractual forms posited by Cox provides a basis for the hypothesis formulation. Nevertheless, no empirical investigation between the correlation of asset specificity in the buyer-supplier relationship and M&A is provided.
Das and Teng, 2000	Based on the theoretical foundations of RBV, Das and Teng examine the role of corporate resources in strategic alliances. They attempt to establish a general resource-based theory of strategic alliances by synthesising the various findings from the literature on alliances from a resource-based perspective. They focus on four main dimensions of strategic alliances: their rationale, formation, structural preferences, and performance.	Various propositions are developed that form the basis for further empirical research. In addition, suggestions are made regarding possible research methods and directions. Of particular relevance to this thesis is that, according to Das and Teng, certain resource characteristics contribute to value creation for firms and are beneficial for alliance formation. These are: imperfect mobility, imitability and substitutability. Adding to this, alliances are also formed to realise superior resource combinations.	The findings provide a basis for hypothesis formulation, but only partial consideration is given to the VRIN criteria (the valuable and rare criteria are left out). Moreover, no examination of supplier integration through vertical integration, M&A in particular, is included in the discussion.
de Souza Filho and Miranda, 2019	This article explores the relationship between asset-specificity and the design of hybrid governance structures. The study refers to specific governance models adopted by horticultural smallholders in the Serra Fluminense region of Brazil.	According to the results of the study, asset specificity, both human and physical, lead to an increase in the intensity of coordination of transactions between companies, resulting in hybrid forms of coordination, and leading to more complex bundles of coordination mechanisms.	It only represents a subset of the characteristics of asset specificity. There is no consideration of vertical integration, including backward integration with suppliers.

Author	Research characteristics	Key findings - contribution to this study	Addressed research gap
Espino-Rodríguez and Padrón-Robaina, 2006	The article provides an overview of some of the main works dealing with outsourcing from the resource-based view of the company (RBV). On one hand, the premises of outsourcing are presented, and on the other, different approaches to outsourcing are introduced and a concept is proposed that is more consistent with the theoretical framework used.	Espino-Rodríguez and Padrón-Robaina put forward two central propositions “the more valuable and specific (heterogeneous) the resources and capabilities of an activity or business process, the less it will be outsourced” and “the more non-substitutable and inimitable are the resources and capabilities inherent to an activity or business process, the less it will be outsourced” (Espino-Rodríguez & Padrón-Robaina, 2006, p. 62).	The paper provides a sound basis for further investigation of vertical integration. However, no empirical study is provided, nor are approaches to boundary decisions regarding activities during M&A considered.
Gancarczyk, 2016	The study deals with the growth of companies based on the theoretical foundations of both RBV and TCT in order to establish propositions that address the decision rules and structural elements of companies in the context of the growth process. In doing so, studies on entrepreneurship, corporate growth and on strategic management and organizational science are included, which deal with the size and growth of firms.	The study reveals the following results relevant to this thesis. Entrepreneurial decisions about the "how" of growth are explained by TCT. RBV has moderating effects as the growth mechanism is based on matching transaction and capability characteristics with governance mode. Asset specificity and uncertainty associated with business transactions determine the choice between hierarchical and hybrid growth modes. In the case of the hierarchical growth mode, the match or mismatch of expansion with a company's core competency leads to organic or acquisitive growth modes.	The results of this work omit explicit consideration of the existing resources of both buyer and supplier as possible influencing factors in decisions on governance modes and growth, instead placing TCT criteria in the foreground of entrepreneurial decisions in relation to boundary decisions. Moreover, explicit consideration of M&A with suppliers is not made.
Gulbrandsen, Sandvik and Haugland, 2009	The article deals with antecedents of vertical integration. A model of vertical integration based on TCT and RBV was derived and tested based on data from the market for mechanical maintenance services in the hydropower industry.	It was found that asset specificity and proximity to existing competencies are positively related to vertical integration, suggesting that insourcing and outsourcing decisions can benefit from the simultaneous application of transaction cost economics and the resource-based view.	Investigation is made of the vertical integration of companies' activities but not of firms or suppliers as a whole. No reference is made to mergers and /or acquisitions.
Hobbs, 1996	On the basis of TCT, Hobbs analyses what effects transaction costs have on vertical coordination mechanisms. The study refers in particular to the coordination at the different stages within supply chain management; that is, from the execution of transactions on the spot market to vertical integration depending on the corresponding transaction costs.	Hobbs developed three hypotheses relevant to this study: A low degree of uncertainty associated with a transaction tends to lead to spot market transactions. A low level of specificity of the assets involved in a transaction tends to lead to spot market transactions. A low frequency of transactions favours vertical integration as opportunism increases due to information asymmetries.	The work only concerns purely theoretical derivations of propositions with no empirical investigations. No specific consideration of the backward integration of suppliers in the context of vertical coordination is made. However, it provides approaches for empirical investigations.

<b>Author</b>	<b>Research characteristics</b>	<b>Key findings - contribution to this study</b>	<b>Addressed research gap</b>
Lewis, Brandon-Jones, Slack and Howard, 2010	The paper examines the development of competitive advantages of companies, referring to the RBV and ERBV theories as the basis of the study. The objective is to assess the extent to which firms can create resource-based advantages and the ways in which resources can be combined. The study provides comprehensive empirics on the development of competitive advantages from both the RBV and the ERBV perspectives.	The study findings shed light on how companies can achieve competitive advantage by combining traditional and extended (external) resources. It shows that external resources can create an initial competitive advantage, which companies can then build on by investing in internally-limited resources. Suppliers play a role when they are involved in the development of products on which specific capabilities can then be built within company boundaries.	The study provides a basis for hypothesis development. The competitive advantage resulting from combining corporate resources with those of the supplier base is considered, but not applied in the context of vertical integration or mergers and acquisitions with suppliers.
Park, Lee and Coo, 2017	The article is concerned with the development and evolution of the governance of IT resources in enterprises. In this context, the possibilities of integration, construction and reconfiguration which can lead to the creation of competitive advantages for companies are discussed. Based on ERBV, the paper conceptualises external and internal IT governance. The authors propose three directions between governance extremes and formulate hypotheses on how they impact the performance of companies.	The results of the study first show that a market-based orientation by companies offers advantages in terms of market growth. Second, a hierarchy-based alignment leads to an optimisation of the companies' operational efficiency. Third, a network-based focus offers the greatest advantage in the delivery of innovation services.	The work provides approaches to the thesis in that the combination of internal and external resources can lead to specific competitive advantages. The focus is on specific resources only and not as such on the company as a bundle of resources. The scope of the focus is also not on the vertical integration of suppliers, but on performance
Wang and Zajac, 2007	This paper examines the different forms of governance when companies attempt to strategically combine their resources. This involves a discussion of the governance or cooperative forms of alliance and acquisition. Wang and Zajac examine the extent to which the configurations of two companies' resources and capabilities affect the costs and respective advantages associated with each governance structure.	The results of the study show that specific factors related to two companies have an influence on them forming an alliance or making an acquisition, namely resource similarity and complementarity; partner-specific knowledge between companies; and the combined relational capabilities of the companies involved. The degree of similarity between two firms has a weaker relationship with the likelihood of an alliance formation than with the likelihood of an acquisition occurring between them.	Similarity is presented in this paper as business similarity based on the Standard Industrial Classification (SIC) codes used by two companies. Therefore, the similarity of companies' resources or competencies is not specifically examined, nor is there any focus on backward integration.

The studies summarised represent important components with regard to the formulation of the thesis hypotheses, which are presented in Chapter 3 and discussed based on the literature review.

## 2.7 Summary

This chapter has dealt with different theories of relevance to this study and the terminology used in supply chain management and mergers and acquisitions was synthesised. The relevant theories, namely transaction cost theory, and the resource-based and extended resource-based views, were discussed and their respective relevance for the perspectives of supply chain and boundary decisions, especially with regard to M&A, was evaluated.

The definition used for the supply chain is represented by the extended supply chain, which includes suppliers of the immediate supplier and customers of the immediate customer, with a particular focus on the flow of products and services.

This thesis concerns backward integration; that is, M&A with firms located upstream in the supply chain (suppliers) who produce different products and/or services within the same value and/or supply chain (Brown & Renwick, 1996; Hill & Jones, 1989). Against the background of ERBV, M&A can also be understood as a twofold extension of the supply chain, since on the one hand suppliers can be regarded as such an extension (Mason, 1996), while on the other, taking ERBV into account, M&A could generate competitive advantages not only with the acquired supplier, but also through the extended virtual supply chain; that is, with the suppliers' supplier base.

The motives or determinants for M&A are manifold, with the transaction cost-driven as well as the resource-based determinants being of particular importance for this work. Although the motives and determinants of M&A based on cost efficiencies from vertical integration (Chemla, 2003; Gaughan, 2010) and transaction cost explanations (Dyer, Kale, & Singh 2004; Harzing, 2002; Kale, Singh, & Raman, 2009) have been explored in the research, the focus has been more on exploring explanations for why certain governance forms have been preferred over others for entering foreign markets rather than examining different determinants of M&A with suppliers (Dyer et al., 2004; Harzing, 2002; Hennart & Park, 1993; Kale, Singh, & Raman,

2009). According to the literature review, research in M&A does not provide sufficient approaches to understanding the determinants of M&A and its effects from a supply chain perspective. However, TCT does seem to offer relevant approaches with transaction costs playing a central role in supply chain management, as the improvement of supply chains aims at increasing their efficiency and achieving competitive advantages, both of which can be based on improved cost efficiency (Hobbs, 1996).

This is in line with the view of the definition of supply chain management developed in this thesis, namely that the task of SCM is to maintain and improve performance, which in turn requires cross-functional integration within the company and with its suppliers in order to be successful (Kannan & Tan, 2010). In this way, SCM can be understood as the source of the creation of competitive advantage through successful buyer-supplier relationships (Choon Tan, Lyman, & Wisner, 2002; Wynstra, Suurmond, & Nullmeier, 2019). SCM involves organisational boundary decisions that are fundamental to effective supply management functions (Axelsson, Rozemeijer, & Wynstra, 2005).

Within the supply chain, decisions have to be made about which governance mode to choose and under which circumstances, which in turn is based on transaction costs (Hitt, 2011). Vertical integration can ultimately be seen as an alternative to SCM from the supply chain perspective (Ellram, 1991).

TCT has the potential to explain vertical coordination within the supply chain, from spot market transactions to vertical integration or M&A (Cox, 1996; Hobbs, 1996). Consequently, the three constructs of asset specificity, environmental uncertainty and frequency of transaction play an important role in this thesis.

From the resource-driven M&A perspective, a predominant motive for the thesis is that firms wish to expand in order to improve their critical competencies (Child & Rodrigues, 2005; Luo & Tung, 2007); in other words, M&A is a tool to acquire resources that are not available on the factor market (Barney, 1986; Ferreira & Tallman, 2007). According the research



conducted for this study and in relation to previous research on M&A in the context of RBV, there are few approaches to explain the determinants of vertical integration in M&A and their impact. Nevertheless, RBV and ERBV theory offers a way of identifying possible determinants and then investigating their impact. With regard to the potential determinants, it is primarily a question of the nature of resources and competences.

In essence, from the RBV expertise, combining resources is about generating competitive advantage by combining and exploiting resources (Barney, 1991, 1995; Das & Teng, 2000; Eisenhardt & Martin, 2000; Peteraf, 1993; Schroeder et al., 2002). Boundary decisions are relevant in that the drivers for M&A include the resources of both the firm and the supplier, which can therefore be a motivation for M&A (Penrose, 1959), because the firm can transfer its existing resources and capabilities into its own hierarchical governance structure through acquisition or merger with another firm, in this thesis with suppliers (Barney, 1999).

The relevance of the supply chain perspective in the context of RBV theory in the thesis is rooted in the relationship between the resource-providing firm and the resource-supplying suppliers (Hitt, 2011), whose resources are managed through hybrid modes of governance in the form of inter-firm relationships and collaborations (Das & Teng, 2000; Dyer & Singh, 1998; Grant & Baden-Fuller, 2004) or through vertical integration through M&A (Penrose, 1959) along the supply chain.

The similarity of resources between firm and supplier also plays an important role in the further investigations of this study, since firms grow by integrating activities that are related to existing ones (e.g., Barney, 1991; Gancarzyk, 2016; Nason & Wiklund, 2018; Richardson, 1972; Winter, 1988). Against this background, this study refers to the closeness of the existing competence of the supplier's resources to the company's resources (Gulbrandsen et al., 2009).

In addition to RBV, the extension of this theory, ERBV, is also relevant for this work as, in contrast to RBV theory, it explicitly deals with the creation of competitive advantage through resources and capabilities that lie outside the company's boundaries (Ali & Abou, 2021;

Cao & Zhang, 2011, Lewis, 2000; Squire, Cousins, Lawson, & Brown, 2009; Park et al., 2017; Yang et al., 2019). Therefore, for this study the supplier base of the supplier is very relevant when it comes to acquiring strategic resources; that is, those with VRIN criteria that are outside the company's own boundaries, for example through mergers or acquisitions.

According to the literature review, both theories appear to have the potential to answer the overall question of the thesis; that is, identification of the determinants of vertical integration and their impact on backward integration through M&A. Nevertheless, it became evident that both theories are subject to criticism. For example, TCT has been criticised for not paying enough attention to the value creation process (e.g., Madhok, 2002), whereas RBV theory contradicts this with its theoretical approach of combining resources to create competitive advantage.

Although the two theories differ significantly, they also have commonalities and interrelationships. There is a complementarity between asset specificity and competencies (Cox, 1996), and high asset-specific investments are also referred to as crucial firm-specific resources (Williamson, 1981; Zhao, Luo, & Suh, 2004). The two theories are also intertwined insofar as decisions about which competences to acquire or develop are also likely to be based on the choice of governance modes, which in turn are based on considerations of transaction costs (Argyres & Zenger, 2012).

Within the two theoretical strands, different research gaps were identified in the literature review, which will be addressed in this study in the context of the empirical analysis. Evidently, the theories of TCT, RBV and ERBV and their respective constructs have been used as a theoretical basis in connection with boundary decisions, but the connection to backward integration through M&A has not been explicitly investigated.

TCT is a theory that is often used to examine the effectiveness of governance modes from a transaction cost perspective, but empirical research to date has focused on the integration

of specific transactions rather than on the vertical integration of firms or suppliers, including through M&A. This research gap is addressed in this study.

Although Cox's 1996 paper outlines a theoretical discussion of M&A with suppliers, this theoretical framework on asset specificity was not followed by an empirical study, which will be made in this thesis in order to fill this specific research gap. Moreover, only one construct (asset specificity) was employed by Cox in this case, so that the theoretical approach remained unidimensional.

Since TCT plays an important role when it comes to boundary decisions, as it essentially concerns the efficient management of transactions and exchange relationships (Ketokivi & Mahoney, 2020), this study explores what constructs beyond asset specificity can be derived to study the backward integration of suppliers through M&A. At the time of writing, no determinants have been derived in the literature that specifically impact M&A with a firm's suppliers. This study attempts to fill this research gap.

Considering specific literature from the field of M&A, it can be seen that TCT has also been used to explain the execution or performance of M&A (Ferreira et al., 2014). However, it should be noted that these studies did not focus on the motives or determinants of M&A, but rather on modes of entry into foreign markets (Dyer et al., 2004; Harzing, 2002; Hennart & Park, 1993; Kale, Singh, & Raman, 2009; Kathuria, 2018). Therefore, research in the field of M&A also suffers from a gap, which is addressed in this study.

From the RBV perspective, the literature review has shown that no empirical study has been conducted to date that investigates the influence of resources with VRIN criteria on governance forms within the supply chain in relation to backward integration. In this context, constructs that can serve as determinants of vertical integration to test their influence on such integration through M&A have not yet emerged. Therefore, this study will on one hand identify the determinants of vertical integration that emerge from the resource-based view, and on the other test hypotheses derived from them to understand their influence on M&A execution.

Since supply chain management is concerned with orchestrating resources to create competitive advantage (Sirmon, Hitt, & Ireland, 2007), it is crucial to understand which determinants impact the execution of backward integration through M&A from an RBV perspective. This study attempts to fill this apparent research gap.

Although ERBV assumes that the creation of competitive advantage can also be achieved through resources and capabilities created outside the firm's boundaries (Ali & Abou, 2021; Cao & Zhang, 2011; Lewis, 2000; Squire, Cousins, Lawson, & Brown, 2009; Park, Lee, & Koo, 2017; Yang et al., 2019) and thus shows promise for supply chain governance studies, there are no studies to date that reject constructs from this theory and at the same time examine the relationship with backward integration.

Both theoretical angles (RBV/ERBV and TCT) will be utilised in the ongoing discussion for the following three reasons: first, in both areas of investigation, there are research gaps with respect to the present research setting; second, both theories provide very relevant approaches to the object of investigation; and third, these theories have linkages that promise to be relevant for the later discussion of the empirical results and their research contributions. Building on the research aim and questions, as well as the research gaps derived from the literature review, the thesis hypotheses are developed in the following chapter based on the constructs of the theories (ERBV, RBV and TCT). The constructs are presented in a structured and transparent way, followed by elaboration of the hypotheses, which are finally reflected in the conceptual framework in order to subsequently evaluate the methodology for conducting the empirical investigation to test them.

### 3 Hypothesis Development

In this chapter, the suggested conceptual framework is developed. First, a general framework is created, which represents the overall context of the thesis; that is, the connections between the underlying theories, their constructs, and the connections between M&A and SCM in this context. The hypotheses are then derived. On one hand, they are based on the theoretical constructs of TCT, namely asset specificity, uncertainty and frequency. On the other, the nature of RBV resources and capabilities form the basis for the derivation of the hypotheses, extended by the nature of external resources from the ERBV perspective. The hypotheses are fundamentally subject to the research aim (RA) of the thesis, which is to gain an understanding of potential determinants of vertical integration and to investigate their impact on backward integration through M&A with suppliers from a supply chain perspective. Furthermore, the constructs reflect the answer to the research question: What determinants impact vertical integration through mergers and acquisitions with suppliers from a supply chain perspective?).

#### 3.1 Overview of Constructs

A construct can be defined as an abstract term that describes a phenomenon from a theoretical perspective (Nunnally, 1978; Schwab, 1980). From the point of view of this thesis, the constructs refer to phenomena that are real in the sense that they exist independently of the consciousness of the author and the facts to be investigated (Loevinger, 1957; Messick, 1981). This view goes hand in hand with the underlying positivistic philosophical stance of the thesis. Tables 3 and 4 illustrate the constructs adopted in the research based on the discussions in Chapter 2. These are asset specificity, competences, uncertainty and frequency, which are based on TCT as well as external resources and capabilities, which in turn are based on RBV and ERBV.

Table 3 shows a summary of the constructs that originate from TCT and briefly presents their relevance to SCM and M&A, while Table 3 presents a summary of those that originate from RVB and ERBV.

Table 3: Key constructs of the thesis derived from TCT (Source: Author)

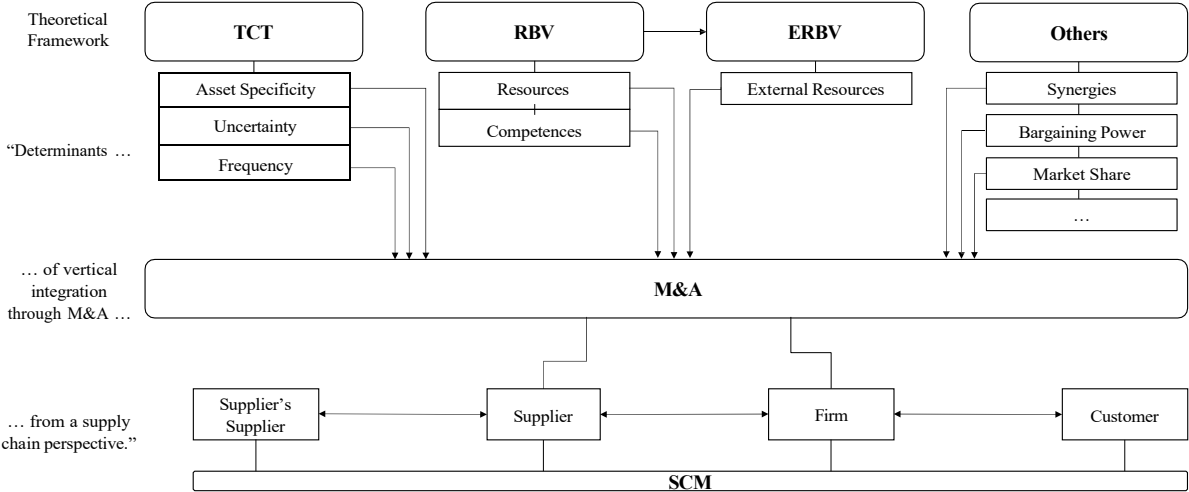
<b>Theory</b>	<b>Construct</b>	<b>Brief definition</b>	<b>Supply chain relevance</b>	<b>M&amp;A relevance</b>
TCT	Asset Specificity	“The degree to which an asset can be redeployed to alternative uses by alternative users without sacrifice of productive value” (Williamson, 1989, p. 142). High specific investments have little to no value outside the inter-party relationship (Williamson, 1981).	Asset specificity refers to the inter-party relationship of a transaction and can explain the degree of cooperation between supply chain parties within inter-firm relationships (Cox, 1996; Hobbs, 1996).	Asset specificity has an influence on vertical coordination, which reflects different governance modes ranging from spot market transactions to vertical integration (Hobbs, 1996) – such as M&A.
TCT	Core Competences	High asset specificity can be described as the “[...] skills and expertise that are the core competences of the firm in sustaining their position to make profit in a market” (Cox, 1996).	Relationship modes, influenced by the core competences of firms (Cox, 1996) assign different governance structures to the supply chain.	The closer the competences of the suppliers approach the core competences of the company, the more likely it is that external relationships can lead to mergers and acquisitions (Cox, 1996).
TCT	Uncertainty	Uncertainty is concerned with environmental circumstances framing transactions. It arises when the conditions surrounding the transaction cannot be specified in advance (Williamson, 1979, 1985).	Uncertainty tends to lead to transactions on the spot market, while a high degree of uncertainty tends to lead to forms of vertical coordination that involve more control, such as contracts, strategic alliances or vertical integration (Hobbs, 1996).	Uncertainty has an influence on vertical coordination, which reflects different governance modes, ranging from spot market transactions to vertical integration (Hobbs, 1996) – such as backward integration through M&A.
TCT	Frequency	Transaction frequency refers to how often a transaction takes place (Williamson, 2008).	Transaction frequency influences the potential governance mode along the supply chain regarding the vertical coordination within it (Williamson, 2008).	The more often a specific, uncertain and complex transaction is performed, the stronger the tendency towards vertical integration (Picot & Franck, 1993) – such as backward integration through M&A.

Table 4: Key constructs of the thesis derived from RBV and ERBV (Source: Author)

Theory	Construct	Brief definition	Supply chain relevance	M&A relevance
RBV	Resources	“All assets, capabilities, organisational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness” (Barney, 1991, p. 10).	The relationship between the resource-procuring firm and the resource-providing suppliers plays a particularly important role (Hitt, 2011). Resources can be obtained through hybrid governance modes in the form of inter-firm relations and cooperation (Das & Teng, 2000; Dyer & Singh, 1998; Grant & Baden-Fuller, 2004) by means of contracts (Barney 1999; Gainey & Klaas 2003; Grant 1991) along the supply chain.	“A firm’s internal growth through M&A, diversification, and investment is also driven by its resources”(Penrose, 1959) and the firm can acquire (or merge with) another to transfer its existing resources and capabilities into its own hierarchical governance structure (Barney, 1999).
RBV	Capabilities	Resources and capabilities or competences are used interchangeably and represent tangible assets, such as physical and financial assets, and intangible assets, such as reputation, knowledge and skills, used in the implementation of firms’ strategies (Barney, 1991; Das & Teng, 2000; Eisenhardt & Schoonhoven, 1996).		Firms have the tendency to expand their boundaries towards those fields where their present capabilities can be used to create new values and gain comparative advantage accordingly (Richardson, 1972; Winter, 1988). Firms might grow through vertical integration (through M&A) by complementing their resources and capabilities with something closely related (Winter, 1988) to their existing knowledge, experience and skills (Richardson, 1972).
ERBV	External Resources	ERBV explicitly deals with the creation of competitive advantages through resources and capabilities which are outside the firm’s boundaries (Ali & Abou, 2021; Cao & Zhang, 2011, Lewis, 2000; Squire, Cousins, Lawson & Brown, 2009; Park, Lee, & Koo, 2017; Yang et al., 2019).	The accessibility to external resources is achieved by the existence of certain forms of cooperation between companies within the supply chain (Ireland et al., 2002; Rungtusanatham et al., 2003).	An acquisition represents an opportunity to create further competitive advantages by combining internal resources (Barney, 2009). From ERBV’s point of view, the expansion of the supply chain, based on M&A, for example, will then again provide the opportunity to generate further competitive advantages through new strategic resources outside the firm’s boundaries (as the previous external resources would then be internalised through M&A) (Lavie, 2006).

The different constructs constitute the determinants which ultimately influence vertical coordination; that is, which ones, as evidenced by Tables 3 and 4, have a potential impact on the implementation of mergers or acquisitions. The supply chain perspective is examined from the firm's point of view, whereby both the direct supplier and the downstream suppliers play a significant role; in this context, the construct of external resources, based on ERBV, is of particular relevance. The TCT and RBV constructs refer to the determining effect on M&A with regard to the direct suppliers of the firm up the extended supply chain. The relationships between the constructs, the supply chain and M&A are illustrated in Figure 9.

Figure 9: General framework of the thesis (Source: Author)



Other factors that emerged from the literature review, such as synergies (Eun & Resnick, 2010), bargaining power (Carney, 2009; Huang, Huang, & Chen, 2013) and market share (Carney 2009) are included as examples in Figure 9 to illustrate that there are further factors that can be considered as determinants which could be taken up in future research. However, they are excluded from this thesis, as it focuses on (E)RBV and TCT as a theoretical basis. Therefore, based on the constructs summarised in Table 2 and Figure 6, the hypotheses to be investigated are presented in the following section.



## 3.2 Hypotheses

The supply chain is understood in this thesis as a virtual network of organisations which includes different processes and activities through upstream and downstream links and which ultimately generate added value for the consumer of products and services (Christopher, 1992, 2016). Building on this, the supply chain is seen as a network of organisations and not as a concerted alignment of independent companies involved in the distribution of materials.

In this work, M&A processes are understood as vertical procedures in the form of backward integration, with an emphasis on upstream parties; that is, suppliers. As suppliers can be seen as a virtual extension of the supply chain from the supply chain perspective (Mason, 1996), M&A can also be seen as a twofold extension: a factual extension through vertical integration through M&A and a further virtual extension through the supplier base of the acquired firm.

The thesis examines the determinants of the extension of a firm's boundaries by M&A within the supply chain. The "extended supply chain", which allows connections within the supply chain at several supply stages (Mentzer et al., 2001), is the conceptual focus of the work. The thesis concentrates on backward integration; that is, mergers or acquisitions with companies that are located up the supply chain, namely suppliers.

TCT provides different approaches for the study of backward integration through mergers and acquisitions, in which the explanation of vertical coordination, including the supply chain perspective, most notably provides useful explanatory approaches (Hobbs, 1996). Vertical coordination reflects different governance modes, ranging from spot market transactions to vertical integration. Within TCT, one of the most important determinants of vertical integration is the nature and level of transaction costs (Williamson, 1975), as the decision taken by firms as to whether to enter into a particular type of governance mode will depend primarily on the initial and ongoing costs of such a transaction (Hitt, 2011).

According to Williamson (1985, 1989), there are certain transaction characteristics which form the basis for deriving the choice of governance; that is, the choice between hierarchy, market and hybrid forms of the two. The focus here is on optimising transaction costs under certain conditions. The most important principles which determine the choice of governance, and the transaction characteristics which can also serve as a basis for the development of the hypotheses, are asset specificity, uncertainty and frequency.

A predominant motive of M&A can be seen in the exploitation of synergies (Alexandridis, Petmezas, & Travlos, 2010; Bradley, Desai, & Kim, 1988; Seth, 1990; Seth, Song, and Pettit, 2000), including the reduction of costs (Gaughan, 2010). Cost reduction can be achieved under certain conditions through the extension of firms' boundaries through vertical integration (Argyres & Zenger, 2012). A firm tends to undertake backward integration if transaction costs can be reduced, or in order to gain control over the supply of valuable assets and prevent potential competitors from gaining access to them (Williamson, 2008).

From the supply chain perspective, cost reduction is one of the SCM objectives (Stevens, 1989), as it can ultimately lead to competitive advantages (Porter, 1985). Note that this is only the case when cost reduction is the main driver of competitive advantage (Cousins, 2005), while in other circumstances agility or supply chain agility may also be more important (Wu, Tseng, Chiu, & Lim, 2017), such as the emphasis on fostering innovation, flexibility and speed (Lin & Tseng, 2016; Chen, 2019).

Cost efficiency can be achieved through vertical M&A by eliminating opportunism (which could have led to self-interest in the behaviour of both parties prior to a merger or acquisition) and vertical restraints (restriction of competition in agreements between companies relating to different levels of production and distribution processes), both of which could have increased the operating costs of the firms involved prior to a merger or acquisition (Chemla, 2003). Vertical restraints can therefore also be understood as costs that can be associated with executing economic trade and incurred in overcoming market imperfections, and so they can

also be understood as transaction costs; that is, “the costs of carrying out any exchange, whether between firms in a marketplace or a transfer of resources between stages in a vertically integrated firm” (Hobbs, 1996, p. 17).

Based on the transaction cost theory, the continuum of vertical coordination reflects a range of possible governance modes, which in turn can be understood as different degrees of supply chain management (Hobbs, 1996). In this context, transactions within the market are regulated by supply and demand, while firms are vertically integrated constructs maintaining control within the hierarchy (Heide, 1994).

Asset specificity, as one possible determinant of vertical integration through M&A, can explain the degree of coordination within a supply chain (Cox, 1996; Hobbs, 1996). If a buyer purchases products or services from a supplier that are either non-specific in nature or produced with non-specific assets, these tend to be purchased on the spot market (Hobbs, 1996). While transactions with low or medium asset specificity in a gradation of hybrid cooperation within the framework of vertical coordination can be outsourced, the higher the asset specificity, the further the governance mode tends to move towards a formal vertical integration (e.g., through M&A) at the end of the spectrum of vertical coordination (Hobbs, 1996).

A high degree of asset specificity can also be equated with critical firm-specific resources (Williamson, 1981; Zhao, Luo & Suh, 2004) or with core competencies of a firm (Cox, 1996; Prahalad & Hamel, 1990; Richardson, 1996) representing the specific skills and abilities of firms that should be retained within them (Cox, 1996; Richardson, 1996). In this context, from the supply chain perspective, buyer-supplier relationships provide explanations for M&A from this TCT-oriented perspective. As discussed in Chapter 2, the “continuum of asset-specific external contractual forms” of Cox (1996) provides a model relevant to the supply chain perspective, which will serve as the basis for the empirical investigation in this thesis.

Cox (1996) argues that firms need to continuously review their boundaries. His model provides a theoretical approach to answering the question of the efficient boundaries of firms,

especially with regard to medium asset-specific goods and services. The complementary competences on which this is based must therefore be considered in a differentiated way. The closer these competences are to the core competences of the firm, the more it should consider vertical integration; that is, M&A. According to the model, the opposite is the case if the complementary competencies of the supplier's assets are very different from the core competencies of the firm. In this case, vertical integration through M&A is not a beneficial form of governance (Cox, 1996). The closer the market competencies are to low asset specificity, the more likely it is that there will be several, if not many, potential suppliers on the market for these products or services (Cox, 1996). The closer the competences are to the core competences of high asset specificity, the more likely it is that the initially external relationships with suppliers will lead to vertical integration through M&A (Cox, 1996).

If asset specificity rises, transaction costs may also rise. This is due to the fact that the relationship between the parties changes and that there are opportunistic incentives for them to exploit this particular dependence of the transaction partner (e.g. supplier); for example, by attempting to capture their quasi-rent (e.g., by charging higher prices). This can again result in renegotiations of the contract conditions and therefore in higher transaction costs (Picot & Dietl, 1990). Transactions with high asset specificity (core competences) tend to be held in the company or internalised through vertical integration, while assets with low asset specificity tend to be acquired on the spot market (Hobbs, 1996; Cox, 1996). Based on the preceding explanations, the following hypothesis is formulated:

**H1:** The higher the degree of asset specificity within the relationship between buyer and supplier, the greater the likelihood of using backward integration through M&A.

Another central construct is uncertainty, which can also influence different governance forms within a supply chain (Hobbs, 1996; Sabet et al., 2017). Uncertainty is attributed to the

degree of volatility and unpredictability of market developments (external uncertainty about changes in availability, technologies, prices and other significant market disruptions within a supply chain) or it occurs in potential buyer-supplier relationships when companies are unable to verify whether their suppliers would meet certain requirements (internal uncertainty) (Amaral, Billington, & Tsay, 2006). Therefore, if this this uncertainty is present, the market is apparently not the right governance form because it is not possible to assess what to reward and how (Williamson, 1981).

Both forms of uncertainty lead to increased transaction costs (ex ante and ex post) (Afuah, 2001; Crook et al., 2013). One motive for M&A is cost reduction. Vertical integration through M&A has the potential to increase cost efficiency by reducing opportunism, which leads to cost-inefficient self-interest behaviour (Chemla, 2003). If vertical integration leads to a reduction in costs, especially in transaction costs, then a company will tend to undertake vertical integration (Williamson, 2008).

Uncertainty affects the cost of governance in different ways. As it increases, so does the number of contingent liabilities that can affect a contract. The increasing uncertainty therefore also increases the costs to be expected from the design and enforcement of contingent claim contracts (Williamson, 1985). Subject to the existence of asset specifics, uncertainty leads to transactions being shifted from the market to a hierarchy (Williamson, 1985; Hobbs, 1996).

Following the line of argumentation already discussed, uncertainty is a transaction cost driver. The reduction of these costs could therefore be achieved through vertical integration of a supplier through M&A. From a supply chain perspective, a low degree of uncertainty tends to lead to transactions on the spot market, while a high degree of uncertainty might result in vertical integration at the end of the continuum of vertical coordination (Hobbs, 1996). The following hypothesis is therefore posited:

**H2:** The greater the environmental uncertainty, the greater the likelihood of using vertical integration through M&A along the supply chain.

In addition to asset specificity and uncertainty, transaction frequency appears to be a determinant which could have an influence on the execution of M&A from the perspective of the supply chain. A higher number of transactions leads to higher monitoring costs; vertical integration could reduce these (Williamson, 2008). On the other hand, a high number of transactions between firms within the supply chain leads to well-established practice which the parties involved in may not want to ruin by opportunistic behaviour (Hobbs, 1996).

If transactions relate to specific assets, the decision as to whether these should be internal or external also depends on their frequency (Williamson, 1983). If the asset specificity is low, then it can be assumed that the transactions should be made externally, that is, via the market; this is beneficial as the market is competitive and firms can therefore purchase goods or services of low specificity at a reasonable cost (Williamson, 1983), which is the case regardless of the frequency of the transactions. In contrast, for transactions involving high asset specificity, in which the frequency of transactions is high, vertical integration may be more advantageous than market transactions, as it may allow the firm to avoid costly investments. In addition, control over these transactions allows the firm to adapt more to changing circumstances (Williamson, 1983).

This is consistent with the fact that one motive for M&A is cost efficiency (Chemla, 2003), which, in line with the previous argument, could be achieved by reducing transaction costs through backward integration; for example, through M&A. This leads to the following hypothesis:

**H3:** The higher the frequency of transactions between a firm and its supplier, the higher the likelihood of backward integration through M&A along the supply chain.

One of the main motives for M&A is the exploitation of synergies between the value chains of the merged entities (Alexandridis, Petmezas, & Travlos, 2010; Bradley, Desai, & Kim, 1988; Seth, 1990; Seth, Song, & Pettit, 2000). Through the combination of rare resources, so-called collusive synergies can be exploited, which can be represented by an increase in market power (Clougherty & Duso, 2011). Therefore, besides (transaction) cost reduction aspects, M&A can also be accompanied by resource-driven motives, in which related processes act as an instrument to acquire resources outside a firm's boundary, which can contribute to the competitive advantage for it (Amit & Schoemaker, 1993) and improve its critical competences (Luo & Tung, 2007).

Therefore, the discussion of core competences can also be conducted from the RBV perspective. RBV has been used as a theory to explain M&A, although in the past the focus has not been on backward integration. Nevertheless, RBV-related studies have shown that firms primarily want to execute M&A in order to improve their core competencies (Child & Rodrigues, 2005; Luo & Tung, 2007). Companies should invest in those activities and resources that create such competences (Quinn & Hilmer 1994), as these generate long-term competitive advantages (Prahalad & Hamel, 1990).

A firm is not limited to its own resources (Barney, 1999; Cheon et al., 1995; Gancarczyk, 2016) but can choose whether to develop them or purchase them through suppliers (Grant, 1991). From a supply chain view, resources that generate competitive advantages can also be internalised through M&A; that is, through vertical integration of suppliers. From the supply chain management perspective, the question arises as to which type of collaboration between a company and the suppliers is the most efficient to preserve external resources. This could be a merger with, or acquisition of, suppliers further up the supply chain through vertical backward integration. The motivation for M&A can be seen in the acquisition of strategic resources (Deng, 2009) to realise competitive advantages (Amit & Schoemaker, 1993). One way to obtain resources is to acquire another firm in order to transfer its existing resources and

capabilities into the buyer's own hierarchical governance structure (Barney, 1999). Moreover, a high degree of business affinity correlates positively with acquisitions (Dyer & Singh, 1998; Stuart, 2000).

From the RBV perspective, questions about the boundaries of a firm are related to its resources and competencies (e.g., Penrose, 1959; Wernerfelt, 1984). RBV assumes that companies will grow through the expansion of activities which are related to existing ones (e.g., Santos & Eisenhardt, 2005; Teece et al., 1994; Winter, 1988).

The similarity and complementarity of resources play an important role (Tanriverdi & Venkatraman, 2005; Wang & Zajac, 2007). The question of integration can therefore be answered by assessing the relatedness of existing skills and new skills needed to perform a new activity; that is, the extent to which existing skills can be utilised to undertake the new activity (Richardson, 1972; Winter, 1988). In this context, the closeness to present competences constitutes a useful approach; that is to say, the similarity between the pool of competences of the company and the new competences needed to perform the activities bought from the supplier (Gulbrandsen et al., 2009). Vertical integration therefore tends to take place when a high degree of similarity of resources, capabilities or competences exists (Gulbrandsen et al., 2009; Poppo & Zenger 2002; Winter, 1988). M&A is a form of vertical integration, which in this thesis is understood as the backward integration of a supplier along the supply chain. This leads to the following hypothesis:

**H4:** The higher the degree of closeness between the buyer's present competences and the competences required for a specific activity performed by a supplier, the higher the likelihood of backward integration through M&A.

Core competences, that is, the strategic competences that contribute to growth and give direction to a firm (Petergraf, 1993), play an important role in RBV theory when it comes to



insourcing (and thus also outsourcing) decisions (Gilley & Rasheed, 2000; Cheon, Grover, & Teng, 1995). Penrose (1959) claimed that the external growth of a company can be driven not only by its ability to utilise resources, but also that its internal growth can be driven by M&A and thus by the internalisation of external resources. From the supply chain perspective, decisions must therefore be made between different forms of collaboration within it. A determinant which acts as a motive for the implementation of M&A is the acquisition of strategic assets (Deng, 2009), namely assets or resources that serve to realise competitive advantages (Amit & Schoemaker, 1993). According to Barney (1991, p. 10), resources are, amongst others, “all assets... that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness. The less the extent to which such resources are available on the market and the fewer their alternatives, the more a firm tends to integrate such resources, while non-core competencies tend to be outsourced (Espino-Rodríguez & Padrón-Robaina, 2006).

In line with this argument, Barney (1991) holds the view that companies with rare and valuable resources generate competitive advantages. However, sustainable advantages can only be achieved if these resources are also inimitable and not substitutable (Barney, 1991). Therefore, resources that generate sustained competitive advantages are those which accord with VRIN criteria (Barney, 1991); that is, which are valuable, rare, inimitable, and non-substitutable. Firms should focus on those resources that provide core competencies (Prahalad & Hamel, 1990). There could then be an empirically verifiable link between the resources that provide or contribute to the core competencies of the firm and its boundary decisions within its extended supply chain.

According to Grant (1991), the need to create resources is based on the lack of existing resources and skills. Firms must assess which resources support them in their activities and which generate sustainable competitive advantages (Grant, 1991); that is, resources that meet the VRIN criteria (Barney, 1991), namely ones that are difficult to identify, not easy to

understand, imperfectly transferable, difficult to reproduce, and moreover which the company has under its control (Grant, 1991).

If there is a lack of such resources, firms have the choice of either developing ones internally or acquiring them externally (Grant, 1991). Eventually, these resources should be used for the benefit of customers (Hamel & Prahalad, 1994). The same is true for the supply chain perspective, because this can be defined as a virtual network of organisations which, through upstream and downstream links, are involved in various processes and activities which will ultimately generate added value for the consumers of products and services (Christopher, 2016). Therefore, it can be posited that the more valuable the resources are, and the higher the customer benefit (Lepak & Snell, 1998), the more likely it is that activities based on such resources will be carried out in-house (Saunders et al., 1997). However, if resources are only valuable, this is not sufficient to maintain competitive advantages in the long run (Petergraf, 1993), because only ex post restrictions, that is, inimitability and non-substitutability of resources, can ensure lasting competitive advantages (Petergraf, 1993).

Espino-Rodríguez and Padrón-Robaina (2006) put forward two propositions from the outsourcing perspective in relation to the discussion above: “the more valuable and specific (heterogeneous) the resources and capabilities of an activity or business process, the less it [*sic*] will be outsourced” and “the more non-substitutable and inimitable are the resources and capabilities inherent to an activity or business process, the less it [*sic*] will be outsourced” (Espino-Rodríguez & Padrón-Robaina, 2006, p. 62).

M&A does not reflect a short-term transaction, but is designed to have a certain durability, so companies should aim to create long-term strategic value when undertaking M&A (Lu & Feng, 2010). Valuable (V) and rare (R) resources lead to competitive advantages, but not to sustainable ones, and are therefore not of long-term strategic value (Barney, 1991). Sustainable competitive advantages arise when there is also inimitability (I) and non-substitutability (N) of resources (Barney, 1991). On the basis of these notions, the two

propositions can be reversed from the outsourcing perspective to an insourcing or vertical integration perspective and, in combination with each other, can lead to the following hypothesis:

**H5:** The closer the resources acquired from a supplier are to the VRIN criteria, the higher the likelihood of vertically integrating the supplier through M&A.

According to RBV, an acquisition represents an opportunity to create further competitive advantages by combining resources internally (Barney, 2009). However, while RBV assumes that competitive advantages can only be achieved by bundling strategic resources within company boundaries (Barney, 1999), ERBV takes a further step by assuming that strategic resources can also be used outside company boundaries to realise competitive advantages (Ali & Abou, 2021; Cao & Zhang, 2011, Lewis, 2000; Squire, Cousins, Lawson, & Brown, 2009; Park et al., 2017; Yang et al., 2019). According to ERBV, accessibility to external resources depends on the different forms of cooperation between companies within the supply chain (Ireland et al., 2002, Rungtusanatham et al., 2003); that is, different forms of cooperation between buyers and suppliers. According to Xu and Huo (2014), many companies try to build close relationships with their suppliers in order to gain competitive advantages by working with them.

Suppliers can be regarded as virtual extensions of the supply chain (Gandhi et al., 2017; Mason, 1996; Copacino, 1996); therefore, from the ERBV standpoint, M&A deal with suppliers which could generate competitive advantages from the resources obtained and additionally from the resources of the extended supply chain.

In the light of ERBV logic, M&A can serve as an instrument for enhancing the actual supply chain and thus as an extension of the virtual supply chain, representing an opportunity to obtain strategic resources and competitive advantages. From this perspective, M&A can be

an instrument for ensuring access to the next but one stage within the extended supply chain, thereby opening up further sources for the creation of competitive advantages. Therefore, if competitive advantages resulting from access to the resources of a supplier's suppliers are expected, this could show a positive correlation with the execution of M&A from the supply chain perspective. Extending the previous discussion regarding H5, the following hypothesis is derived:

**H6:** The more a supplier's supplier base possesses VRIN resources, the more likely it is that the buyer will merge with or acquire the supplier.

In summary, it can be stated that due to the variety of possible determinants of M&A, there is no single answer to the question as to why M&A take place, particularly within a supply chain. TCT provides a useful theoretical foundation for devising explanatory approaches to SCM. It also provides explanations for the different governance modes within a supply chain, ranging from transactions via the market to vertical integration through M&A. According to the literature review, these forms of collaboration within the supply chain can also be influenced by different forms of asset specificity and uncertainty. The approaches described by Cox (1996) and Hobbs (1996) are pertinent to this research, especially Cox's perspective on the understanding of asset specificity, which also takes the core competences of a company into account and concurs with the notion adopted by some researchers that a merely (transaction) cost-oriented view is not sufficient to explain vertical integration (Prahalad & Hamel, 1990).

In addition, while scholars have applied TCT in the context of M&A research (Ferreira et al., 2014), it has been less a matter of exploring which determinants can explain M&A than of explaining the motives for different ways of entering foreign markets (Dyer et al., 2004; Harzing, 2002; Hennart & Park, 1993; Kale, Singh, & Raman, 2009). This thesis therefore attempts to help close this gap in the research by analysing the constructs of asset specificity

and uncertainty in order to evaluate the influence of these determinants on backward integration through mergers and acquisitions.

With regard to RBV, the literature review highlighted the importance of a firm's competencies when it comes to vertical integration (through M&A). In this context, closeness or similarity to current capabilities and resources are important approaches, meaning that firms tend to perform new activities in which underlying resources and capabilities are similar to their own. The inclusion of ERBV represents a useful extension, since this theory, in contrast to classical RBV, also understands external resources as a source of competitive advantages and also have explicit connections to SCM. However, research in the area of vertical backward M&A does not appear to have been conducted. This thesis also intends to counteract this lack of research.

(E)RBV and TCT appear to have the potential to provide useful theoretical approaches. While RBV sees the firm as the basis for competitive advantages through the combination and exploitation of resources, TCT defines it as a construct that operates in a cost-oriented environment in which the role of efficient corporate management is at the forefront, which again can be a source of competitive advantage.

The theories of (E)RBV and TCT provide valid theoretical bases, which also accounts for their frequent use. It became apparent in attempts to counteract the shortcomings of each theory (see section 2.5) that the use of both theories in combination could lead to the minimisation of inadequacies. Against this background, the thesis examines the determinants of vertical integration from a supply chain perspective, referring to (E)RBV and the TCT in order to consider both the competence-oriented and the transaction cost-oriented views.

It is evident that scholars have not yet empirically investigated the determinants of vertical mergers and acquisitions derived from TCT, so this research is a novel endeavour. RBV has also been used as a theory to explain mergers and acquisitions, but the focus was neither on backward integration nor on identifying the determinants that influence the vertical integration

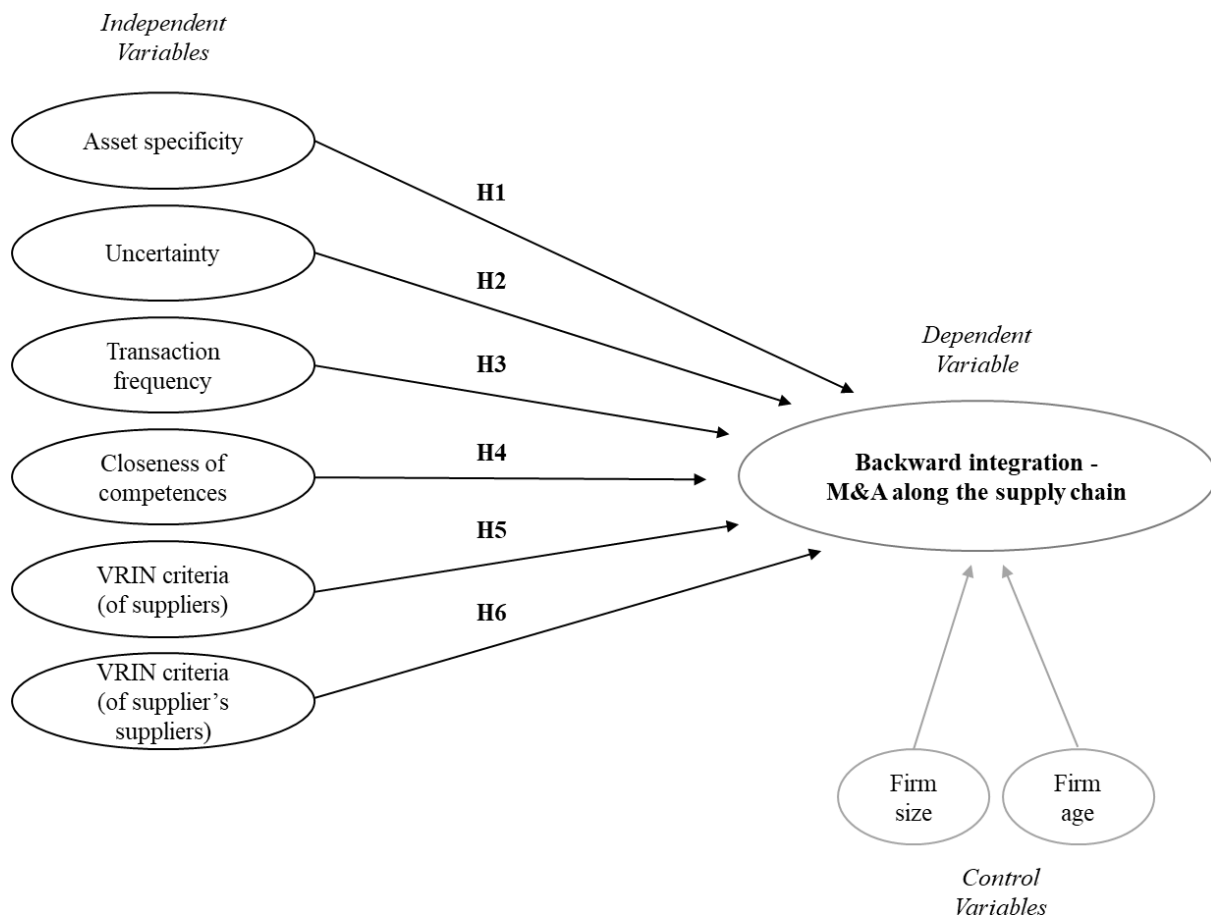
of firms. These relationships are examined for the first time in this study. In conclusion, it can be stated that there are apparently no studies to date in which the determinants of backward integration through mergers and acquisitions have been empirically investigated from a supply chain perspective. However, the aforementioned RBV and ERBV approaches, with their resource-based and capability-oriented angles, and TCT, with its prevailing constructs of uncertainty and asset specificity, provide a sound theoretical basis for this research endeavour. Based on the theoretical key concepts and the derived hypotheses, the following step is to discuss the conceptual framework of the thesis.

### 3.3 Conceptual Framework

The conceptual framework set out below is an illustration of the structure of this thesis, showing how the relevant phenomenon will be explained (Camp, 2001) and thereby representing an outline of the context of the hypotheses developed (Grant & Osanloo, 2014). A conceptual framework provides an integrated approach to the research problem and gives an explanation of the aspects under which it is examined (Liehr & Smith, 1999).

In this thesis, the framework is presented in graphical form in order to present the key variables and their relation to each other within one clear framework (Luse, Mennecke, & Townsend, 2012; Miles & Huberman, 1994). Based on the research hypotheses developed in this chapter, the conceptual framework is illustrated in Figure 10.

Figure 10: Conceptual framework of the determinants of backward intergration through M&A along the supply chain (Source: Author)



In addition to the variables of asset specificity, uncertainty, transaction frequency, VRIN criteria and competence closeness, which are directly linked to the corresponding hypotheses, the control variables of firm size and firm age are also measured. The age of the firm is the number of years that have elapsed since it founded (Hui et al., 2013), while firm size is measured as the total number of employees (Poppo & Zenger, 1998; Lazzarini, Miller, & Zenger, 2008).

The control variables are ones which are not of primary interest to the research, but represent a third, external factor whose influence is eliminated; that is, these variables are

controlled (Salkind, 2010). The researcher estimates factors of interest (such as age and size of firms) that are independent of the other variables under investigation (Salkind, 2010).

The way in which all these variables can ultimately be measured, and the methodological and philosophical basis on which this study is conducted, will be discussed and justified in the following chapter.

### 3.4 Summary

In this chapter, the constructs were presented in a structured way and in addition to a precise definition, the respective relevance for the supply chain perspective and the relevance of the constructs in relation to mergers and acquisitions were highlighted. These connections originate from the central points in the previous chapter, the literature review.

Seven constructs were identified (asset specificity, core competences, uncertainty, frequency, resources, capabilities, external resources), with resources and capabilities understood as one construct, since they are used interchangeably in the literature. Six hypotheses were developed on the basis of the six constructs.

These hypotheses then provide the basis for the development of the conceptual framework, which will be used again later in the thesis, namely in the context of the data analysis, in order to present the results of the tested hypotheses in a structured and clear way.



## 4 Research Philosophy, Methodology & Design

The lack of empirical research on the determinants of backward integration through M&A from the supply chain perspective was discussed in the previous chapters. The hypotheses were formulated and developed based on the theories of (E)RBV and TCT. This chapter will focus on the methodology for conducting the empirical investigation to test the hypotheses.

In this context, two important and closely related issues are evaluated: the epistemological choice and the methodological choice (Sumner & Tribe, 2004). While the former deals with the philosophical assumptions of research (Nodoushani, 2000), the latter refers to the practical side (Trochim, 2006).

Against this background, this chapter will begin with an evaluation of the research philosophies, ontology and epistemology. This will serve as a basis for the description and explanation of the prevailing research paradigms, such as positivism, postpositivism, critical theory and constructivism. The quantitative, qualitative and mixed methods will then be presented in order to contextualise them within the research paradigm of positivism.

The research purpose (exploratory, descriptive, analytical and predictive), the research approach (deductive, inductive and abductive) and the time horizon (longitudinal versus cross-sectional) of the research project will be presented. This will be followed by a section which contextualises all the relevant factors previously evaluated in order to justify both the choice of methodology and the research paradigm. The final section of the chapter will consider the sampling strategy, selection of the sampling method frame, questionnaire development, data collection process and factor analysis.

## 4.1 Research Philosophy

Based on the aims and hypotheses of this work, this section will give an overview of the two research philosophies of ontology and epistemology, whose orientation will determine the research paradigm. The choice of research philosophy has a direct impact on both the research design and data collection methods (Collis & Hussey, 2013). It is therefore important to first evaluate the philosophical stance and choose the appropriate research paradigm for the thesis (Saunders et al., 2019).

### 4.1.1 Ontology

Before starting the "research journey", researchers must be aware of their ontological position. The common definition of ontology is the study of being and the nature of reality (Easterby-Smith, Thorpe, & Jackson, 2015). Ontology answers the question: "What things are there in the world?" (Sayer, 1992, p. 155). It is therefore concerned with the "nature of reality" (Guba & Lincoln, 1994, p. 108) and "the study of being" (Crotty, 1998, p. 10). It refers to a single or multiple reality and to the rejection or advocacy of relativism (Mertens, 2010). Consequently, researchers must examine whether their ontological position can be described as "realistic" or "relativistic" (King & Horrocks, 2010, p. 9). King and Horrocks describe a 'realist ontology' as "the view that the real world is out there and exists independently from us" (p. 9) and cannot be interpreted in terms of our views. In contrast, relativistic ontology rejects this view and assumes that "our understandings and experiences are relative to our specific culture and social frames and reference, being open for interpretations" (King & Horrocks, 2010, p. 9). It can be said that the quantitative research conducted in this thesis tends to relate to a realistic ontology, while the qualitative research tends to relate to relativism (King & Horrocks, 2010). The thesis is also characterised by a "realist ontology", as it tests the hypotheses based on constructs derived from the theories of TCT, RBV and ERBV. Constructs refer to phenomena

that are real, in that they exist regardless of the author's consciousness and of the facts studied (Loevinger, 1957; Messick, 1981).

Ontology can be described as "the study of organisation and the nature of the world independent of the form of our knowledge of it" (Bateman, 1995, p.628). A supply chain is an organisation, in that it involves the management of "the sourcing, flow, and control of materials ... across multiple tiers of suppliers" (Mentzer et al., 2001, p.6). The organisation and management of the boundaries within the supply chain are the subject of the investigation in this study. This is substantiated by the research aim, which is to gain an understanding of the determinants of vertical integration and investigate their effects on backward integration through M&A with suppliers from the supply chain perspective. The study considers the supply chain as a real world that is 'out there' and exists independently of individualism (King & Horrocks, 2010), meaning it can be studied objectively and without bias.

#### 4.1.2 Epistemology

Epistemology describes the theory of knowledge in terms of its methods, validity and scope (Crotty, 1998) and deals with the most appropriate methods for studying the nature of reality (Easterby-Smith et al., 2015) while defining what can be known and how we can know about something (Grix, 2010). It can be described as a "philosophical enquiry into the nature and scope of human knowledge, concerned with distinguishing knowledge from belief prejudice [...] in a nutshell, theory of knowledge" (Benton & Craib, 2001, p. 181). Epistemology attempts to explain the foundations of knowledge and the relationship between the researcher and the known (Denzin & Lincoln, 2011). Therefore, Collis and Hussey (2013) describe the major challenge that researchers must deal with when answering research questions as their relationship to the subject being researched.

In this context, Collis and Hussey claim that it is important to assess what kind of data can and will be collected. These can be quantitative data, from which researchers are largely independent, or qualitative data relating to the interaction between the researchers and their research subject (Collis & Hussey, 2013). Marshall and Rossman (2006) describe the relationships between the overall research strategy, research questions, research design, research genre and methods as "epistemological integrity", for which this research will strive. These connections will be resumed and contextualised later in this chapter (see Figure 13).

The section below explains why a positivist view meets the research objective and why the alternatives of induction and abduction have been excluded, while the deductive research approach is discussed in detail in Chapter 4.4.2.

## 4.2 Research Paradigms

According to Guba (1990), research paradigms can be characterised by their ontology, epistemology and methodology. A research paradigm can be described as a “set of common beliefs and agreements shared between researchers about how problems should be understood and addressed” (Kuhn, 1962, p. 45). Accordingly, these paradigms can also be understood as “a basic set of beliefs that guide action” (Creswell, 2013, p. 6).

The following table illustrates the research paradigms, taking into account ontology, epistemology, methodology, the aim of the inquiry, and the nature of knowledge. The table thus also provides an understanding of the methodological justification, addressing the given research aim of the thesis, which will be discussed in the following sections.

Table 5: Basic beliefs (adapted from Lincoln & Guba, 2003, pp. 256-257)

	<b>Positivism</b>	<b>Postpositivism</b>	<b>Critical Theory</b>	<b>Constructivism</b>
Ontology	Naive realism: the “real” reality can be understood	Critical realism: “real” reality but only imperfectly comprehensible	Historical realism: virtual reality shaped by social, political, cultural, economic, ethnic and gender values	Relativism: local and specifically constructed and co-constructed reality
Epistemology	Dualist/objectivist; true findings	Modified dualist/objectivist; findings probably true	Transactional/subjectivist: value-mediated findings	Transactional/subjectivist: value-created findings
Methodology	Experimental/manipulative; verification of hypotheses; mainly quantitative methods	Modified experimental/manipulative; falsification of hypotheses; may include qualitative methods	Dialogic/dialectical	Hermeneutical/dialectical
Inquiry aim	Explanation: prediction and control	Explanation: prediction and control	Critique and transformation	Understanding and reconstruction
Nature of knowledge	Establishes verified hypotheses; established as facts/laws	Non-falsified hypotheses; probable facts/laws	Structural/historical insights	Individual or collective reconstructions coalescing around consensus
Research Approach	Deductive	Deductive / inductive	Inductive	Inductive

In the following sections, the paradigms are explained and distinguished from each other with reference to the research objective and the research question. In addition, it will be shown why a positivist view meets the research objective and why the alternatives of induction and abduction were rejected, which will be discussed in more detail in section 4.4.

#### 4.2.1 Positivism

Positivism can be understood as the traditional form of research. The epistemological stance is grounded in natural science and based on objectivism (King & Horrocks, 2010). King & Horrocks (2010, p. 12) state that “the positivist position is situated within the epistemological position of objectivism where objects in the world have meaning that exists independently from any subjective consciousness of them”. Therefore, positivists believe in a social world which exists externally to the researcher. They seek to create objective knowledge which is free from researcher bias (Collis & Hussey, 2013) and aim to test theory and hypothesis to gain a better understanding of a phenomenon, and for reality to be measured (Sexton, 2000). Positivism can also be defined as "an epistemological position that advocates the application of the methods of the natural sciences to the study of social reality and beyond" (Bryman & Bell, 2003, p. 14). The hypotheses developed will be tested in the thesis. Under the assumption that reality is quantifiable, they will be measured by adopting a quantitative method, the questionnaire.

The ontology of positivism rests upon naive realism, in which the ‘real’ reality can be understood (Lincoln & Guba, 2003). Positivists believe that human beings, as part of the natural world, can be studied just like other objects in the physical world can be examined. In order to explain certain phenomena, positivists strive to establish universal laws and axioms (King & Horrocks, 2010). The thesis author believes that reality can be understood and studied in relation to the hypotheses in question. From the results of the research, universal laws will be derived on the determinants of backward integration from the supply chain perspective, which correlate positively or negatively with M&A.

Positivism assumes that science quantitatively measures independent facts about a single understandable reality (Guba & Lincoln, 1994); therefore, it is closely related to quantitative research. The data and their analysis are value-free, since the researchers who

observe the data look at the world through a "one-way mirror" (Guba & Lincoln, 1994, p. 110). Positivists are mostly concerned with collecting and analysing quantitative data, conducting surveys and questionnaires, and aiming to make analysis available through correlation and regression (e.g. Escuer, Olmos, & Martinez, 2013; Espino-Rodríguez & Padrón-Robaina, 2006; Gandhi et al., 2017; Gulbrandsen et al., 2017; Lai et al., 2012; Lin & Wu, 2014; Park, Lee, & Koo, 2017; Parmigiani, 2007; Poppo & Zenger, 2002; Squire et al., 2009).

The research aim of this thesis is to gain an understanding of the potential determinants of vertical integration and to investigate their effects on backward integration through M&A with suppliers from the supply chain perspective. The thesis aims to answer the following research question in a non-judgemental way:

- RQ: What determinants impact vertical integration through mergers and acquisitions with suppliers from a supply chain perspective?

The descriptive and explanatory research (see further details in section 4.4.1) conducted for the study answers the “what” and “how” questions with a deductive approach (see further details in section 4.4.2). Therefore, the study moves from general law to specific cases, and starts with a screening of theory (Ali & Abou, 2021; Escuer, Olmos, & Martinez, 2013; Espino-Rodríguez & Padrón-Robaina, 2006; Gandhi et al., 2017; Gilley & Rasheed, 2000; Taylor, Fisher, & Dufresne, 2002) to identify the determinants of vertical integration based on a solid theoretical foundation (Danermark, 2001; Hyde, 2000). It draws on RBV, ERBV (e.g. Xu & Huo, 2014) and TCT (e.g. Gulbrandsen et al., 2017), which provide explanations for different forms of governance within the supply chain. Subsequently, these are used as a foundation to test whether the theories are applicable to concrete cases, namely in the context of backward integration through M&A with suppliers, in order to build new knowledge and contribute to the research field (see research summary in chapter 7). The aim of the research is achieved by

deriving logical relationships based on established theories, which already exist independently of the author of the thesis. The hypotheses are based on logical relationships derived from the literature. The tests in the study are based on a quantitative method, with the use of a survey in the form of an online questionnaire (see sections 4.3 and 4.6 for detailed explanations).

The aim of the thesis is to develop universal laws about which determinants of backward integration through M&A exist and what impact these have on such integration, so that based on this, the 'real' reality can be understood and true findings can be uncovered. These true findings are manifested by testing the six hypotheses presented in Chapter 3. The new knowledge that this thesis contributes is thus based on verified hypotheses, established as facts and laws, which in turn could be used for future research as objective facts for the deeper understanding of the reality of the verified determinants of backward integration.

To achieve the research goal, the study rejects knowledge as a social product, but sees it as an object to be discovered that exists outside and independently of the individual mind (King & Horrocks, 2010). Therefore, new knowledge can be derived from the existing knowledge that is out there and tested quantitatively (e.g. Ali & Abou, 2021; Escuer, Olmos, & Martinez, 2013; Espino-Rodríguez & Padrón-Robaina, 2006; Gandhi et al., 2017; Gilley & Rasheed, 2000; Govindan, Azevedo, Carvalho, & Cruz-Machado, 2014; Gulbrandsen et al., 2017; Lai et al., 2012; Lin & Wu, 2014; Park, Lee, & Koo, 2017; Parmigiani, 2007; Poppo & Zenger, 2002; Squire et al., 2009).

In summary, in this thesis, as argued above, objects have meaning and exist independently of the researcher's consciousness, since constructs derived from hypotheses can be tested in research to address the research aim, which in turn are regarded as existing independently of the researcher's consciousness (Loevinger, 1957; Messick, 1981). In addition, a quantitative approach is used, which is consistent with the paradigm of positivism previously described (e.g., Escuer, Olmos, & Martinez, 2013; Xu & Huo, 2014) and the fact that positivists aim to test theories and hypotheses in order to gain a better understanding of a phenomenon



(e.g. Gulbrandsen et al., 2009; Lin & Wu, 2014). The method of conducting a survey, especially a questionnaire, chosen for this thesis also correlates strongly with the positivistic orientation of the work (cf. Escuer et al., 2013; Park et al., 2017; Parmigiani, 2007). The paradigms of postpositivism, critical theory and constructivism are presented below to show the difference between them and the paradigm of positivism applied in the thesis and thus to make a distinction, which underpins the positivist point of view adopted.

#### 4.2.2 Postpositivism

As stated before, positivists believe that the researcher and the subject of research are independent of each other. However, postpositivists accept that the subject researched can be influenced by the knowledge, background and experiences of the researcher (Robson, 2002). Nevertheless, in this thesis, the research will be conducted through a questionnaire intended to be absent of any influence from the researcher.

Positivists, like the researcher of this thesis, take the view that research is value-free, while postpositivists believe that bias cannot be avoided, even though they consider it to be undesirable. Consequently, researchers are obliged to be aware of their values and beliefs and understand that they might have an influence on their research. This applies to their choice of measures, questions and definitions, as well as to their interpretation and analysis of their work (Cameron & Miller, 2007). In this context, postpositivism could be seen as a research paradigm located between positivism and interpretivism (Grix, 2010).

According to Guba and Lincoln (1994), the ontological position of postpositivism is based on a critical position regarding realism, which is sceptical about the researcher's ability to know reality with certainty. The postpositivist's aim is to hold constantly to the objective of being correct about reality, while acknowledging that this cannot be achieved entirely. The epistemological position of postpositivism rests upon modified dualism or objectivism.

Researchers aim to reduce their ‘contamination’ and believe that the truth can be studied, but cannot be known with certainty (as is believed by positivists). Postpositivists consider that human knowledge rests on human conjecture and is not based on an a priori justification from an objective individual (Lindlof, 2011). Like positivists, they believe that a “real” reality exists, but they also take the position that it can only be known imperfectly. This thesis assumes that reality can be measured without being influenced by the researcher, by conducting quantitative analysis which will be based on objective statistics, thus allowing the "real" reality to be measured.

The identification of the determinants of vertical integration are free of values and beliefs, as they are logically derived from the theories, and the relationships between the determinants of an objective study are unravelled through quantitative measurements, from which the research validity is supported free of interpretation by objective statistical measurements.

#### 4.2.3 Critical Theory

The critical theory that stems from the Frankfurt School and Habermas focused on the importance that individuals attach to their actions (Benton & Craib, 2001). Influencing factors, such as culture, lifestyle and tradition, define what is true and what exists. Different traditions thus describe different realities, which are called value-mediated findings. This view contradicts the stance of this study, which argues that a quantitative method can create number-based findings that are not value-mediated outcomes, but independent findings of objective, unbiased knowledge.

In contrast to the position taken by this study, critical theory thus assumes that virtual reality is shaped by social, political, cultural, economic and ethnic values. The methodology of critical theory is dialectic, in which instrumental case studies, in-depth interviews, focus groups

and critical ethnography studies can be understood as predominant methods (Benton & Craib, 2001). Furthermore, the related inductive approach does not serve to answer the research question and aim, as this thesis is intended to build on existing literature on supply chain management, RBT, ERBV and TCT, in order to identify determinants of vertical integration. The aim of the thesis is not to use data and facts from observation to form tentative hypotheses and define a theory in accordance with the research problem, but to proceed in exactly the other way because, according to the literature review, the discipline of supply chain management has developed into a multidisciplinary research field which has been evolving since the late 1990s (Croom et al., 2000; Ellram & Cooper, 2014; Hitt et al., 2016). In addition, academic papers on (E)RBV (Nason & Wiklund, 2018; Kraaijenbrink et al., 2010; Yang et al., 2019) and TCT theories (Rindfleisch & Heide, 1997; Rindfleisch, 2020) provide a solid theoretical foundation on which to build hypotheses to answer the research question objectively, which in turn is reflected in the positivist viewpoint of the study.

#### 4.2.4 Constructivism

Constructivism and interpretivism are associated research approaches (Schwandt, 1994) and take a subjectivist epistemological position (Lincoln & Guba, 2003). Alfred Schütz's (1962) definition provides a very useful way of explaining the nature of this paradigm:

All facts are from the outset facts selected from a universal context by the activities of our mind. They are, therefore, always interpreted facts, either facts looked at as detached from their context by an artificial abstraction or facts considered in their particular setting. In either case, they carry their interpretational inner and outer horizon (Schütz, 1962, p. 5).

Constructivism has relativism as its ontological basis, which means that there are specific constructed realities (Lincoln & Guba, 2003). Therefore, there is not only a single

reality or truth, but reality is created by individuals (Bryman & Bell, 2015). Consequently, reality needs to be interpreted (Flick, 2013) as “the world of lived reality and situation-specific meanings that constitute the general object of investigation that is thought to be constructed by social actors” (Schwandt, 1994, p. 118).

The underlying concepts of these approaches originate from the German intellectual tradition of hermeneutics and *Verstehen* in sociology, as well as from critiques of positivism in the social sciences (Schwandt 1994, p. 41). Research based on this paradigm aims to explore the complexity of phenomena and to study how participants’ views can be connected to a certain situation (Creswell, 2013). Interpretivism and constructivism typically relate to qualitative methods (Mertens, 2010), such as interpretive case study, holistic ethnography and grounded theory (Benton & Craib, 2001).

This thesis does not pursue this paradigm; constructivism serves here as a demarcation from positivism, as the proposed research will focus on non-interpretable, quantitative and statistically derived results which, from the researcher's point of view, are independent of the context of the participants’ views.

In the following section, the research methodology is differentiated in depth and based on this, the application of the quantitative methodology is justified, which again is embedded in the deductive research approach of the thesis and the positivist philosophical standpoint.

### 4.3 Research Methodology

For researchers, it is critical to find the most suitable methodology for their research endeavours as “(like theories,) methodologies cannot be true or false, only more or less useful” (Silverman, 2012, p. 37).

Methodology is the overall concept of the research process, outlining the way in which the research will be conducted, while identifying appropriate methods which constitute the

means and modes of data collection. It can be understood as the “plan of action” (Crotty, 1998, p. 3), which is inherently connected to the choice of suitable methods and the structure of the research (King & Horrocks, 2010).

As mentioned earlier, Marshall and Rossman (2006) emphasise the importance of ‘epistemological integrity’, which includes the consistent interrelations between the nature of the research, the research questions, the research structure and methods. Therefore, methodology can also be understood as a bridge between the research paradigm and the method (Hesse-Biber & Leavy, 2011).

Methodology is directly linked to the choice of specific methods and the design of the research (King & Horrocks, 2010). Methods refer to the techniques or procedures used to gather and analyse data related to research questions or hypotheses. Within this process, it is crucial to justify both the design and the methods with respect to the research endeavour. It is also essential for researchers to err on the side of a particular philosophical and theoretical position that determines the research process. In this work, this is based on the research paradigm of positivism. Methodology includes the system of methods and describes an approach to systematic analysis, including qualitative, quantitative and mixed methods (Creswell, 2013).

A researchers’ methodology is determined by the chosen research paradigm (Howell, 2013). A positivist, like the author of this thesis, is likely to use a quantitative research method (Easterby-Smith et al., 2015), while an interpretivist is more likely to use qualitative methods. The researcher’s positivistic stance leads to the production of quantitative data which is concerned with the testing of hypotheses (cf. Ali & Abou, 2021; Escuer, Olmos, & Martinez, 2013; Espino-Rodríguez & Padrón-Robaina, 2006; Gandhi et al., 2017; Gulbrandsen et al., 2009; Gulbrandsen et al., 2017; Lai et al., 2012; Lin & Wu, 2014; Park, Lee, & Koo, 2017; Parmigiani, 2007; Poppo & Zenger, 2002; Squire et al., 2009). The following sections explain the quantitative, qualitative and mixed research methods used to determine why the quantitative approach is most appropriate for this work.

#### 4.3.1 Quantitative Research Methods

Quantitative methods are concerned with investigating the number of units in a population that share a specific characteristic. They aim at creating precise and consistent measurements which allow statistical analysis (Collis & Hussey, 2013). Common quantitative methods are experiments, surveys, interviews and questionnaires (Brace, 2018).

Such methods refer to an objective approach while focussing on measuring phenomena and are concerned with collecting and analysing numerical data (Collis & Hussey, 2013). They refer to the investigation of the number of units in a population that share specific characteristics and aim to create precise and consistent measurements while developing and/or engaging with statistical and mathematical models, theories and hypotheses which are connected to the phenomena in question (Kreft & Leeuw, 1998). The process of measurement is vital to quantitative research, as it provides the connection between empirical observation and the mathematical expression of quantitative relationships (Given, 2008). This is precisely the intention of this work; based on the theories of (E)RBV and TCT in the form of the hypotheses presented, relationships will be investigated and then mathematically represented.

In the thesis, quantitative techniques are used to conduct conclusive research, as will be explained in the section 4.4, which can be subdivided in descriptive and explanatory research (Kreft & Leeuw, 1998). Nevertheless, in some cases they are also employed when exploratory research is conducted (Kreft & Leeuw, 1998). Most quantitative researchers take a deductive approach and believe in external social reality (cf. Escuer, Olmos, & Martinez, 2013; Bryman & Bell, 2015; Ali & Abou, 2021; Park et al., 2017). The positivistic stance of this thesis validates the use of quantitative methods (Lincoln & Guba, 2003) and is associated with the development of testable hypothesis-based theories (in this case RBV and TCT) to allow generalisation (cf. Cao & Zhang, 2011; Creswell, 2013; Collis & Hussey, 2013; Gandhi et al., 2009; Gulbrandsen et al., 2017; Gulbrandsen et al.; 2017 Xu & Huo, 2014). This is consistent

with the purpose and design of the thesis, as it adopts a deductive-dominant approach, which serves to address its research aim by building on a strong theoretical foundation (Danermark, 2001; Hyde, 2000). This theoretical grounding is represented by the TCT, RBV and ERBV theories and aims to test the theoretical knowledge (Johnson, 1996) developed prior to the empirical research (Kovács & Spens, 2005) in other contextual settings, which in the thesis is the impact of the determinants of vertical integration on backward integration through M&A. This is further elaborated in Chapter 4.4.1 and distinguished from the deductive approach in order to reinforce its use.

#### 4.3.2 Qualitative Research Methods

Qualitative methods represent interpretative ones aimed at describing, decoding and translating (Van Maanen, 1983). Such techniques refer to outcomes concerned with the meaning instead of the frequency of naturally-occurring phenomena in the social world and provide opportunities to recognise issues and understand why they are significant. Qualitative methods provide prospects to gain in-depth insights into a population. Those conducting exploratory research mainly employ qualitative research, whereas this is used less for formal or conclusive research (Mohajan, 2018; Van Maanen, 1983). Common methods used in qualitative research approaches include participant observation, in-depth interviews and focus groups.

Qualitative research takes a subjective approach, while “examining and reflecting on perceptions in order to gain an understanding of social and human activities” (Hussey & Hussey, 1997 p. 13). Contrary to the aim of this thesis, qualitative methods focus on examining the ‘why’ (and ‘how’) of a phenomenon (Alasuutari, 2010).

### 4.3.3 Mixed Methods

Mixed methods research is a methodology that involves collecting, analysing and assimilating quantitative and qualitative research (Creswell & Clark, 2007). This can be in the form of qualitative dominant mixed studies, quantitative dominant mixed studies and equally mixed studies (Onwuegbuzie, Johnson, & Collins, 2011). The qualitative dominant research approach is mainly grounded in qualitative research, while also employing quantitative methods as a means to gaining better understanding of and insight into the topic under study. It does not attempt to conduct statistical analysis and interpretation for the general population. On the other hand, quantitative dominant means that the research is predominantly quantitative, although with the use of supplementary qualitative approaches. Equally mixed studies use both quantitative and qualitative methods in equal measure.

Johnson, Onwuegbuzie and Turner (2007) state that researchers following a qualitative dominant mixed research approach may take a constructivist-post-structuralist-critical stance. On the contrary, in a quantitative dominant mixed study a postpositivistic research position may be adopted. In management research, most researchers using mixed methods employ quantitative dominant approaches (Bazeley, 2015; Mertens & Hesse-Biber, 2012).

Van Griensven, Moore and Hall (2014) identify one of the main advantages of mixed methods as the possibility of triangulation by using several methods and data sources to examine the same phenomenon. By approaching the research problem from different perspectives by utilising different research techniques, triangulation makes it possible to identify aspects of a research problem more precisely. In this thesis, purely quantitative analysis will be conducted in order in the first instance to be able to deduce lawlike knowledge that goes hand in hand with the researcher's positivistic stance.



The following section deals with the research area of supply chain management, focussing on the research paradigms, methods and theoretical perspectives which are predominantly represented in this field.

#### 4.3.4 Methodology Employed in Supply Chain Studies

According to the study of Burgess et al. (2006), supply chain management researchers apply theories in the fields of economics, strategic management, psychology and sociology. Widespread theories include TCT, together with competitive advantage ones such as RBV. With respect to research paradigms, Burgess et al. (2006) found that most researchers in supply chain management err on the side of positivism. Only a very small number of articles have been based on anti-positivist paradigms, such as constructivism. Accordingly, and following Hitt et al. (2016) and Soni and Kodali (2012), survey research, especially questionnaires, is the most commonly used method for data collection in supply chain studies. In the context of studying the resource-based view, surveys are suitable for obtaining information on the resources and capabilities of a firm, while the most common theory integrated with RBV is transaction cost theory (TCT). It has also been shown that most studies, such as the present one, have been cross-sectional (Hitt et al., 2016). The verification of the reliability and validity of questionnaires is a key issue (Soni & Kodali, 2012). These factors are examined in section 5.3 using statistical, objective, value-free methods.

In order to clarify the question of which methodology is the most appropriate, in addition to the question of which methodology adequately addresses the research objectives, studies concerned with the topic of relationship management in supply management, as well as those concerned with defining firm boundaries from a supply perspective utilising the theoretical strands of RBV and TCT, are reviewed below with regard to the adopted methodology.

Most of the researchers considered in the literature review used quantitative methods to analyse the data, collected employing survey-based methods (e.g., Ali & Abou, 2021; Cao & Zhang, 2011; Choon Tan, Lyman, & Wisner, 2002; Cousins, 2005; Cousins & Spekman, 2003; Espino-Rodríguez & Padrón-Robaina, 2006; Escuer, Olmos, & Martinez, 2013; Gandhi et al., 2017; Gulbrandsen et al., 2017; Li, Ragu-Nathan, & Rao, 2006; Lin & Wu, 2014). Therefore, according to this, the majority of studies within the research area adopted quantitative research methods. Burgess et al. (2006) and Hitt et al. (2016) reinforce these findings, as they found that most researchers in the supply chain area focus on methods around analytical conceptual research strategies as well as on statistical sampling.

The methodical quantitative approach of this thesis is therefore also reflected in the predominant methodological approaches of the research genre of supply chain management, thus contributing to the desired epistemological integrity (see Figure 13).

#### 4.4 Research Design

According to De Vaus (2002), research design is the selected overall strategy incorporating different elements of the research in a clear and consistent way, while ensuring that the research problem is addressed appropriately and effectively. It functions as a blueprint for the collection, measurement and analysis of the data (De Vaus, 2002). Vogt (1993) describes research design as the “science (and art) of planning procedures for conducting studies so as to get the most valid findings” (p. 196). Therefore, such design is a plan that needs to be explicitly created to answer the research question (Dulock, 1993). According to Philliber, Schwab and Sloss (1980), a research structure deals with at least four problems: which questions to study, which data are relevant, which data to collect, and how to analyse the results. The sections 4.4.1 and 4.4.2 will deal with ‘which questions to study’ and ‘how to analyse’ data from the ‘process of utilising knowledge’ view.

#### 4.4.1 Research Purpose

The purpose of research can be divided into exploratory, descriptive, analytical and predictive categories (Sekaran & Bougie, 2016).

Exploratory research is primarily aimed at developing initial ideas and understanding on a specific topic or problem and is typically used when there are no or only a few studies on the research problem in question (Aaker & Day, 1990). It is concerned with gaining insights and familiarity with the subject to provide guidance on possible future research (Collis & Hussey, 2013). Therefore, "the aim of this type of study is to look for patterns, ideas or hypotheses, rather than testing or confirming a hypothesis" (Collis & Hussey, 2009, p. 5). Explorative research usually, but not necessarily, utilises qualitative methods (Robson, 2002).

Descriptive research outlines the characteristics of a population or phenomenon in a given case and examines the research problem in more detail than explorative research, typically dealing with "what"-type questions (Dulock, 1993). Descriptive studies provide a precise picture of certain aspects of individuals, events or situations (Aaker & Day, 1990). The data collected are regularly of a quantitative nature and statistical methods are often used to analyse them (Dulock, 1993). While doctoral theses may include descriptive research, they are also likely to include one of the following types of research purpose described below, as descriptive research alone may not be sufficient (Dulock, 1993).

Analytical or explanatory research is an extension of descriptive research. Researchers go beyond the mere description of characteristics by investigating phenomena in more detail. They aim to analyse the "why" and "how" of something and understand phenomena by discovering and measuring relationships. Identifying the underlying variables is an important part of analytical research. It is an explanatory approach that examines the effect and cause of the relationship between two variables (Collis & Hussey, 2009). "A variable is an attribute of

an entity that can change and take different values which can be observed and/or measured" (Collis & Hussey, 2003, p. 11).

Predictive research anticipates the probability or possibility of a similar situation occurring elsewhere. It provides answers to 'where', 'why' and 'how' questions and intends to draw generalisations from the analysis "by predicting certain phenomena based on hypothesised, general relationships" and is also valuable in situations "where 'what if' questions are being asked" (Collis and Hussey, 2009, p. 6).

This study will focus on both descriptive and analytical research; from this point the approach will be contextualised with the research question. RQ: What determinants impact vertical integration through mergers and acquisitions with suppliers from a supply chain perspective?

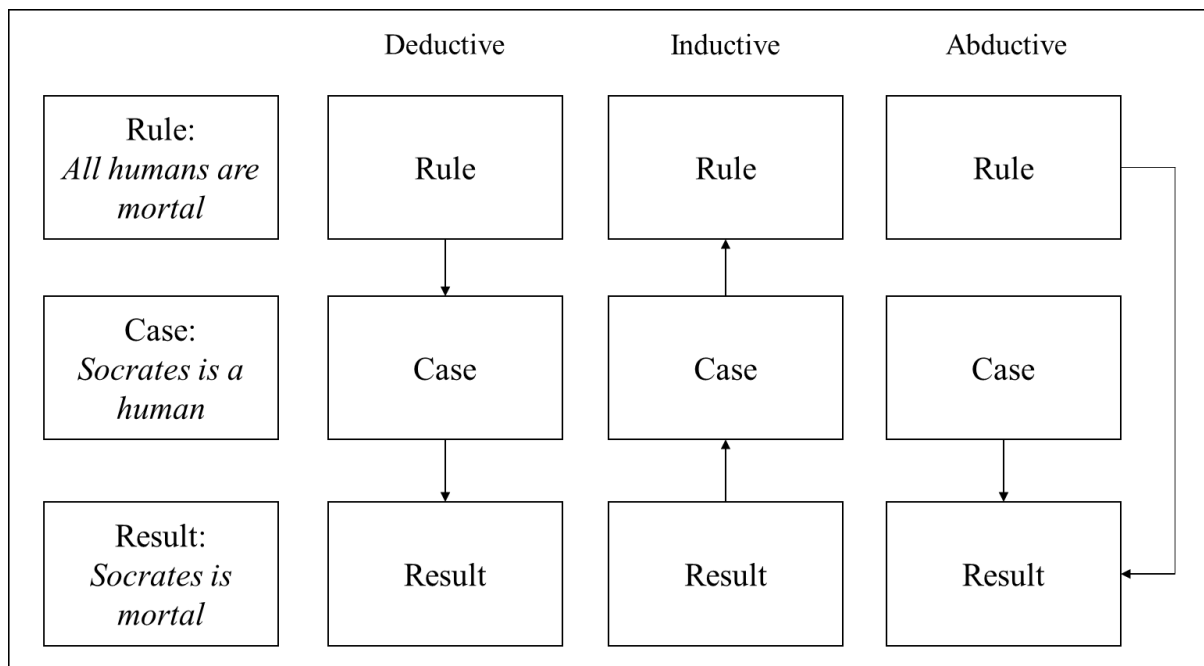
The underlying aim of understanding and identifying the influencing factors on a firm's supply chain, which might have advantageous influences on vertical integration, is concerned with answering both 'what' and 'how' questions. 'What are the determinants of M&A within a firm's supply chain?' is one question that needs to be answered. Descriptive research seems to be most suitable in this case.

However, in order to gain understanding of what influencing factors are beneficial, it is necessary to examine the relationship between these variables to explain 'how' they can be beneficial for vertical integration. Consequently, descriptive and analytical (explanatory) research will be involved in answering the research question. Therefore, the research will go beyond description and study the research problem in greater detail by applying explanatory research.

#### 4.4.2 Research Approach

Research approaches can be understood as the way of reasoning in academic research and represent the process of utilising knowledge to draw conclusions, make predictions, or construct explanations (Singleton, Straits, & McAllister, 1988). The three predominant methods of reasoning are deductive, inductive and abductive approaches (van Hoek, Aronsson, Kovács, & Spens, 2005). This classification provides a clear scheme for investigating the relationship between theory and research (Bryman & Bell, 2015).

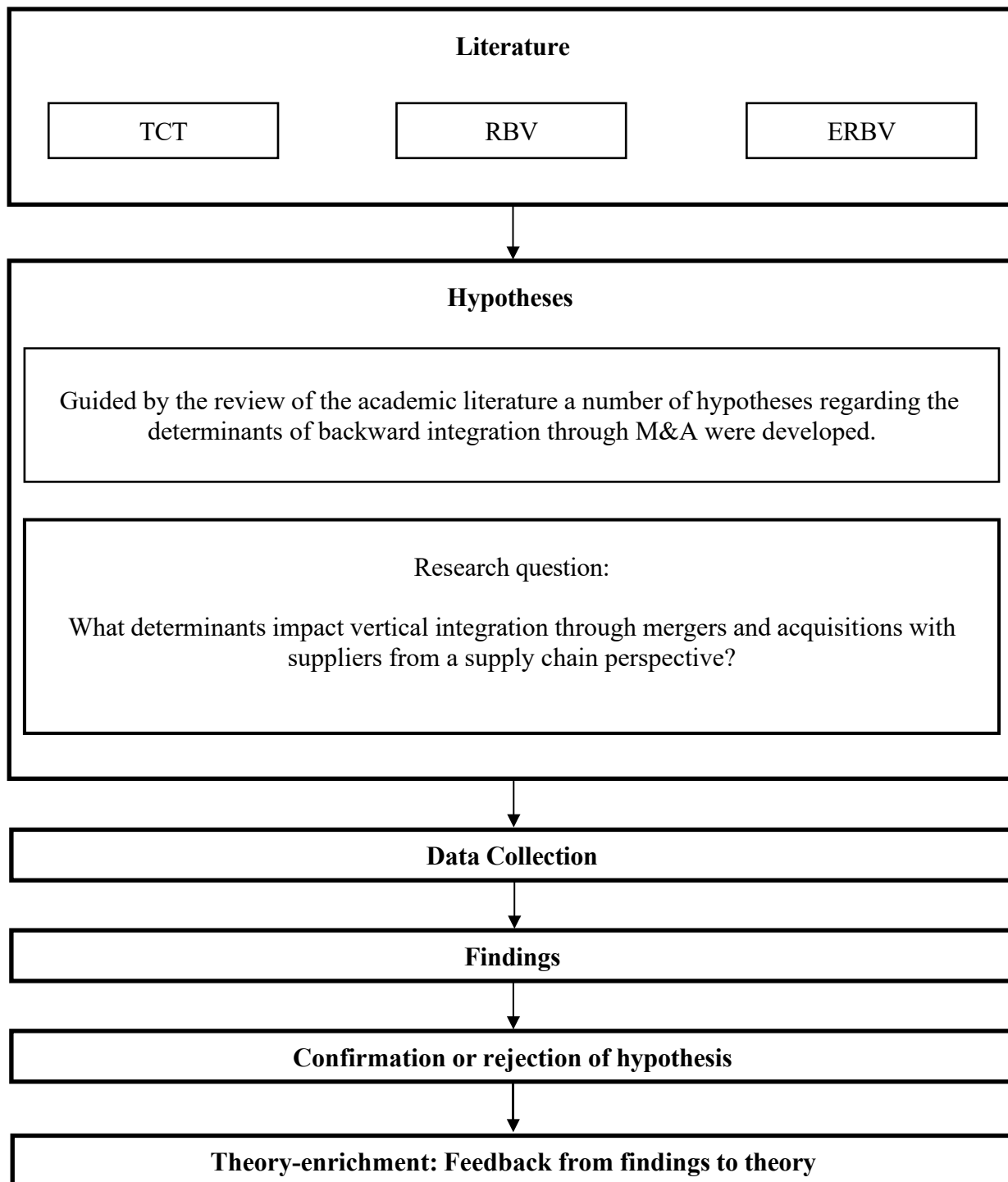
Figure 11: Processes of research approaches (Source: van Hoek, et al., 2005, p. 137)



The deductive approach can be associated with the testing of theories (cf. Escuer, Olmos, & Martinez, 2013; Gandhi et al., 2017; Gulbrandsen et al., 2017; Hyde, 2000; Lin & Wu, 2014; Squire et al., 2009) and starts by declaring general rules before proceeding to specific conclusions. The deductive research approach represents a method of moving from the general to the particular. This allows the researcher utilising theory to establish or validate hypotheses (Blaikie, 2009; Bryman & Bell, 2015; Gill & Johnson, 2010; Spens, & Kovács, 2006) and guide

the process towards the collection of quantitative data (cf. Escuer, Olmos, & Martinez, 2013; Gulbrandsen et al., 2017; Xu & Huo, 2014). While the deductive approach is associated with a positivistic stance, which includes the testing of hypotheses to prove assumptions (Lewis & Ritchie, 2003), the inductive research approach is related to an interpretivist research paradigm as it enables the researcher to provide subjective reasoning with the help of several real-life conditions (Benz & Newman, 2008).

Figure 12: Dominant deductive research approach (Source: adapted from Bryman & Bell, 2007)



As in other supply chain, TCT, RBV and ERBV research (cf. e.g. Escuer, Olmos, & Martinez, 2013; Espino-Rodríguez & Padrón-Robaina, 2006; Gandhi et al., 2017; Gilley & Rasheed, 2000; Govindan, Azevedo, Carvalho, & Cruz-Machado, 2014; Gulbrandsen et al.,

2017; Lai et al., 2012; Lin & Wu, 2014; Park, Lee, & Koo, 2017; Parmigiani, 2007; Poppo & Zenger, 2002; Squire et al., 2009), a deductive research approach is used to develop a conceptual framework from the literature review.

To achieve the research aim of this study, which is to gain understanding of the potential determinants of vertical integration and to investigate their impact on backward integration through M&A with suppliers from a supply chain perspective, a path is followed from general law to specific cases, beginning with screening theory (cf. Ali & Abou, 2021; Escuer, Olmos, & Martinez, 2013; Espino-Rodríguez & Padrón-Robaina, 2006; Gandhi et al., 2017; Gilley & Rasheed, 2000; Taylor, Fisher, & Dufresne, 2002). Based on this, logical relationships are derived from theory. Since deductive reasoning is also defined as a theory testing process that starts from an established theory or generalisation and attempts to test whether this is applicable to specific cases (Hyde, 2000; Spens, & Kovács, 2006), this study exactly follows this approach and derives the determinants of vertical integration from the established theories of RBV, ERBV (e.g. Xu & Huo, 2014) and TCT (cf. Gulbrandsen et al., 2017; Parmigiani, 2007), all of which have substantive patterns that can be used to explain governance forms as the basis for this work. These theories are then tested to establish whether they are applicable to specific cases in the context of backward integration through M&A with suppliers. The logical conclusions in this study are reflected in the form of hypotheses derived from the theories, which are then tested empirically to generate knowledge in the form of generalisations of the results (cf. Escuer, Olmos, & Martinez, 2013; Gulbrandsen et al., 2017; Lin & Wu, 2014; Xu & Huo, 2014). These generalisations are then discussed in Chapter 6 and form the new knowledge built on the prior knowledge identified in the literature review in Chapter 2. In summary, in order to achieve the research aim of the thesis, the deductive research process begins with a strong theoretical grounding (Danermark, 2001; Hyde, 2000), with the aim of testing the theoretical knowledge (Johnson, 1996) developed prior to the empirical research (Kovács & Spens, 2005) in other settings and in the context of other research questions.



On the other hand, as justified below, the inductive approach was not used in this study, for the purposes of differentiation, since inductive research can be seen as a mirror image of the deductive (Johnson, 1996). This work approaches the research problem on the basis of existing knowledge, that is, on the theories of TCT, RBNV and ERBV. Inductive research aims to move from a specific empirical case or collection of observations to a general law (Andreewsky & Bourcier, 2000; Taylor et al., 2002). The inductive approach does not presuppose an existing relevant theory as a starting point (Andreewsky & Bourcier, 2000; Gioia & Pitre, 1990), but is concerned with empirical observations of the world that then lead to hypotheses (Danermark, 2001). Researchers using this type of reasoning are concerned with using data and facts from observation to form tentative hypotheses and to define a theory in accordance with the research problem (Mertens, 2010). However, the purpose of this work is to identify determinants from the existing corresponding theory and to test the impact of these on vertical integration, which is contrary to the inductive approach, as this involves developing a theory rather than testing one (Danermark, 2001; Johnson, 1996).

To reinforce the deductive approach, a distinction is also made here from the abductive research approach. Blaikie (2007) proposed such a method that combines both approaches. According to Dubois and Gadde (2002), this represents a more eclectic form of research that acknowledges the interdependence of the various aspects of the process. Abductive research starts with an observation and aims at deciding which is the most likely inference that can be made from the set of observations (Åsvoll, 2014; Danermark, 2001). In contrast to an approach based on deductive reasoning, the premises do not guarantee the conclusion. Researchers applying abductive reasoning start with the most likely explanation and decide whether it is true. If it is not, they then move on to the next most likely (Åsvoll, 2014). Nevertheless, this is not a suitable approach for this thesis, because abductive research also starts with observations and thus cannot serve the research aim, namely to derive determinants of vertical interaction

from existing theories and to test them, thus developing new knowledge on the basis of the existing.

In summary, and as illustrated in Figure 12, due to the fact that the hypotheses (based on the literature review and in connection with the research question) were initially formulated to be validated or negated by empirical testing, the deductive research method is the suitable approach to follow in order to justice to the research project. The study uses theories such as TCT, RBV and ERBV to hypothesise, collect data and test the derived hypotheses accordingly (see Figure 13). As discussed above, these criteria direct the research towards deductive dominant reasoning. Furthermore, the deductive approach is linked to the research paradigm of positivism with respect to the philosophical perspective (Kirkeby, 1990). As the study follows a positivist approach, the philosophical stance of the researcher is also in line with a dominant deductive research method.

#### 4.4.3 Time Horizon

Researchers distinguish between two types of research based on time scale: cross-sectional and longitudinal studies (Gray, 2014). Therefore, surveys can also be conducted as either type of study. Longitudinal studies collect data from the same sample of people on more than one occasion over a period of time, while cross-sectional ones collect data only once and over a short period (Payne & Payne, 2004). The cross-sectional design collects data at a single time for more than one case in order to gather quantitative or quantifiable data for two or more variables to be studied (Bryman & Bell, 2015). This approach is the most widely used in social research because it allows the results to be collected comparatively quickly (De Vaus, 2001) and is often related to the use of surveys (Saunders et al., 2019).

Within the framework of longitudinal studies, data are collected for each element, or for each variable, over two or more different periods, in which way the persons or cases analysed

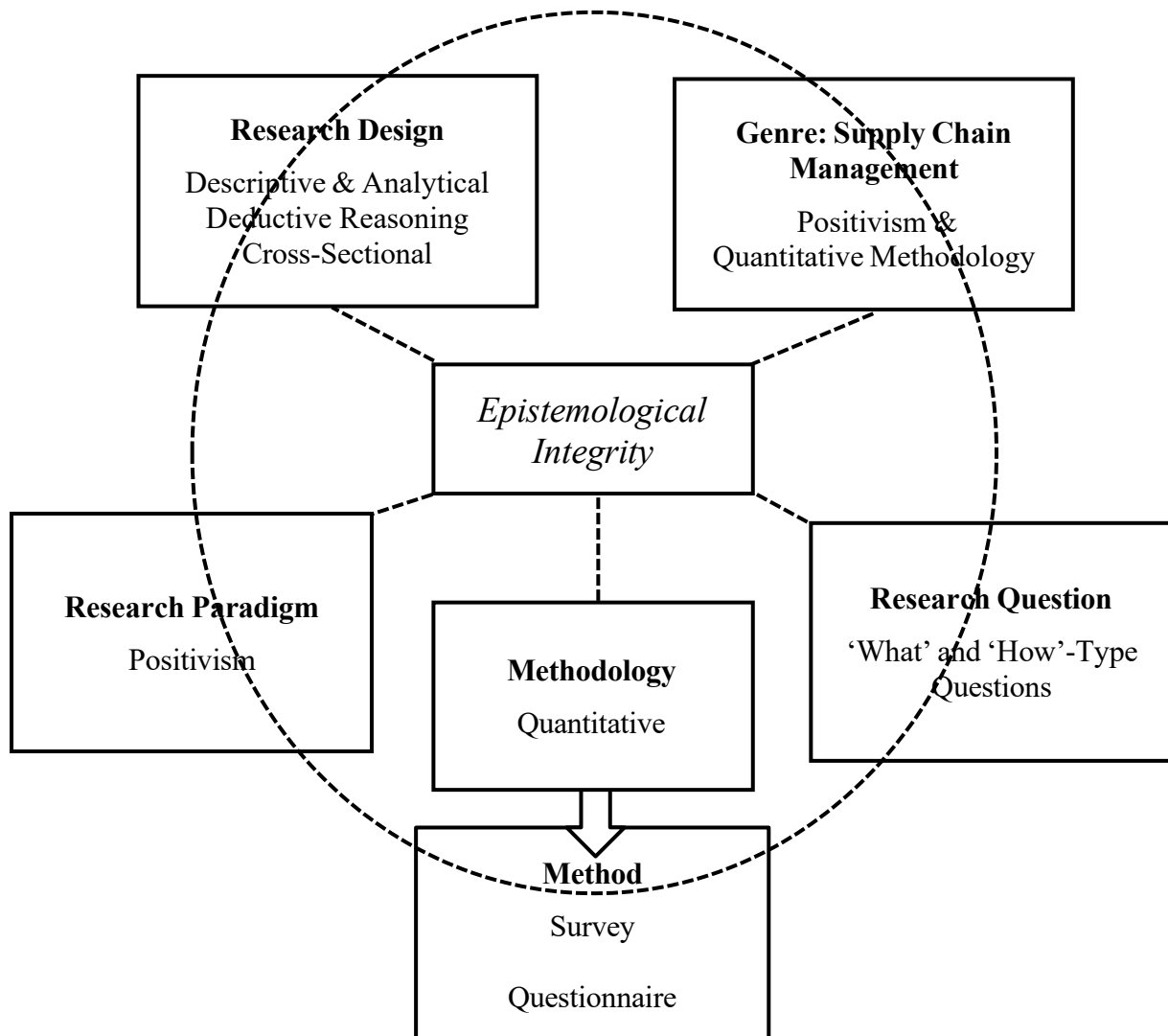
will be the same, or at least comparable, from period to period. In addition, the analysis then includes data comparisons between the different periods (Burton, 2000).

Due to the time frame of this study, which was conducted over a distinct time period and not over several, the nature of the study is cross-sectional. The fact that this method is strongly connected to the survey method, and that it is the most widespread method in the field of social research, makes the survey appropriate for the thesis.

#### 4.5 Rationale for the Chosen Paradigm, Methodology and Research Design

The preceding chapters have provided insights into the research paradigms, methods and theories utilised in the study. This understanding is very helpful in establishing a direction for the research, especially with regard to epistemological integrity, which describes the relationships between the overall research strategy, research questions, research design, research genre and methods (Marshall & Rossman, 2006). The epistemological integrity of this study is summarised in Figure 13.

Figure 13: Epistemological integrity of the research (Source: Author)



The methodology has been thoroughly considered as an integrated part of the whole study and is dependent on the type of research question, as well as the skills of the researcher (Ellram, 1996). According to Yin (1994), three specific factors should be considered when choosing a suitable research methodology: the form of the research question; the degree of control over concrete behavioural events; and the focus on contemporary as opposed to historical events (see Table 6).

Table 6: Relevant situations for different research methods (Yin, 2009, p. 8)

Method	Form of Research Question	Requires Control of Behavioural Events?	Focuses on Contemporary Events?
Experiment	How, why	Yes	Yes
Survey	Who, what, where, how many, how much	No	Yes
Archival Analysis	Who, what, where, how many, how much	No	Yes / No
History	How, why	No	No
Case Study	How, why	No	Yes

According to Meredith (1998), ‘understanding’ is associated with ‘why’-type questions instead of ‘what’ or ‘how’ ones. In order to develop or extend theories, questions need to be raised asking ‘why’ questions which aim at the development of understanding (Meredith, 1998). Having said that, the research question posed in this thesis is related to both ‘what’- and ‘how’-type questions.

The study is based on descriptive and analytical research. These approaches also include finding answers to questions dealing with the ‘what’ and ‘how’ (Collis & Hussey, 2009). The research question is associated with contemporary events related to the inter-organisational relationships of supply chains and their mutual boundaries and are not concerned with historical events. Moreover, there is no need to have control over behaviour or events in this research. Therefore, considering Yin’s (2009) approach of relevant situations for different research methods, the survey is a suitable research method. This is also consistent with the conducting of a survey, in that the questionnaire for this study is a self-completion type, as explained in more detail in the next chapter, which was completed independently by the respondents (Brace, 2018). The researcher therefore has little control over the completion (Brace, 2018). This methodology also goes hand in hand with the positivist approach of the study, whereby the

researcher wants to create unbiased objective knowledge, because the phenomena to be investigated exist independently of the researcher (Collis & Hussey, 2013).

The previous explanation of the chosen method is one of the reasons why the study will follow the positivist paradigm. The survey method and quantitative analysis are in line with the chosen paradigm, as positivism is closely related to quantitative research and is concerned with collecting quantitative data accordingly (Easterby-Smith et al., 2015). In addition, in line with the objectives of quantitative research (Given, 2008) and based on deductive thinking, this study focuses on the development of hypotheses (H1 to H7) based on theories (RBV, ERBV and TCT) related to the research problem (Gill & Johnson 2010).

The aim is to measure reality through quantitative analysis, which in turn sits within the proposed quantitative method, that is, the cross-sectional survey. This is again consistent with the research paradigm relevant to the thesis, in that positivists intend to test theory and hypotheses in order to gain a better understanding of a phenomenon and make reality measurable (Sexton, 2000).

The study is positioned in the epistemological view of objectivism. That means that the data collected from the survey will not be interpreted, and unbiased knowledge will be created (Collis & Hussey, 2013). This will be achieved through the use of the self-completion questionnaire (Brace, 2018).

From the ontological point of view, the researcher of the thesis is realistic, based on the assumption that the "real" reality can be understood in the context of the study of the hypotheses in question (King & Horrocks, 2010). Based on quantitative analyses, the research results will lead to universal laws about the determinants of backward integration from the supply chain perspective that correlate positively or negatively with M&A.

Finally, the fact that positivism is the predominant research paradigm in the research area of supply chain studies and that quantitative methods are classically utilised (Burgess et

al., 2006) further strengthens the positivistic position and the chosen questionnaire method, the design of which is described and discussed in the following section.

#### 4.6 Questionnaire Design

The preceding sections showed that a survey is an appropriate choice for contextualising the study with the methodology. In line with the goal of the study, good survey research is characterised by a process in testing and/or developing theories and forming hypotheses (May, 2011). Researchers commonly utilise surveys to show statistical relations between variables. In order to measure these relations, it is important to operationalise the hypotheses into measures by transforming them into comprehensible statements which can be addressed properly (May, 2011). The survey is also suitable for this study in that it addresses the research question by means of six construct items derived from the theories of TCT, RBV and ERB.

Surveys can be divided into two broad categories: the questionnaire and the interview (Brace, 2018). This study utilises a self-completed questionnaire to gather and analyse data related to the research question (and hypotheses), which also ensures that the question represented by the questionnaire items are answered in an unbiased way, as the questioner is not involved in completing the questionnaire. Furthermore, according to Gillham (2008, p. 6), the benefits of a questionnaire are its low cost in terms of time and money; it is easy to obtain information quickly from many people; the analysis of the answers to the closed questions is straightforward; respondents remain anonymous; questions can be standardised; and it provides rich data for testing hypotheses.

In the following sections, the design of the questionnaire developed for this work is explained and discussed in a structured way.

#### 4.6.1 Construction of the Questionnaire

In order to do justice to a structured discussion, the questionnaire was designed with reference to the procedures outlined by Churchill and Iacobucci (2002).

Figure 14: Procedure for developing a questionnaire (Source: Churchill and Iacobucci, 2002, p. 315)

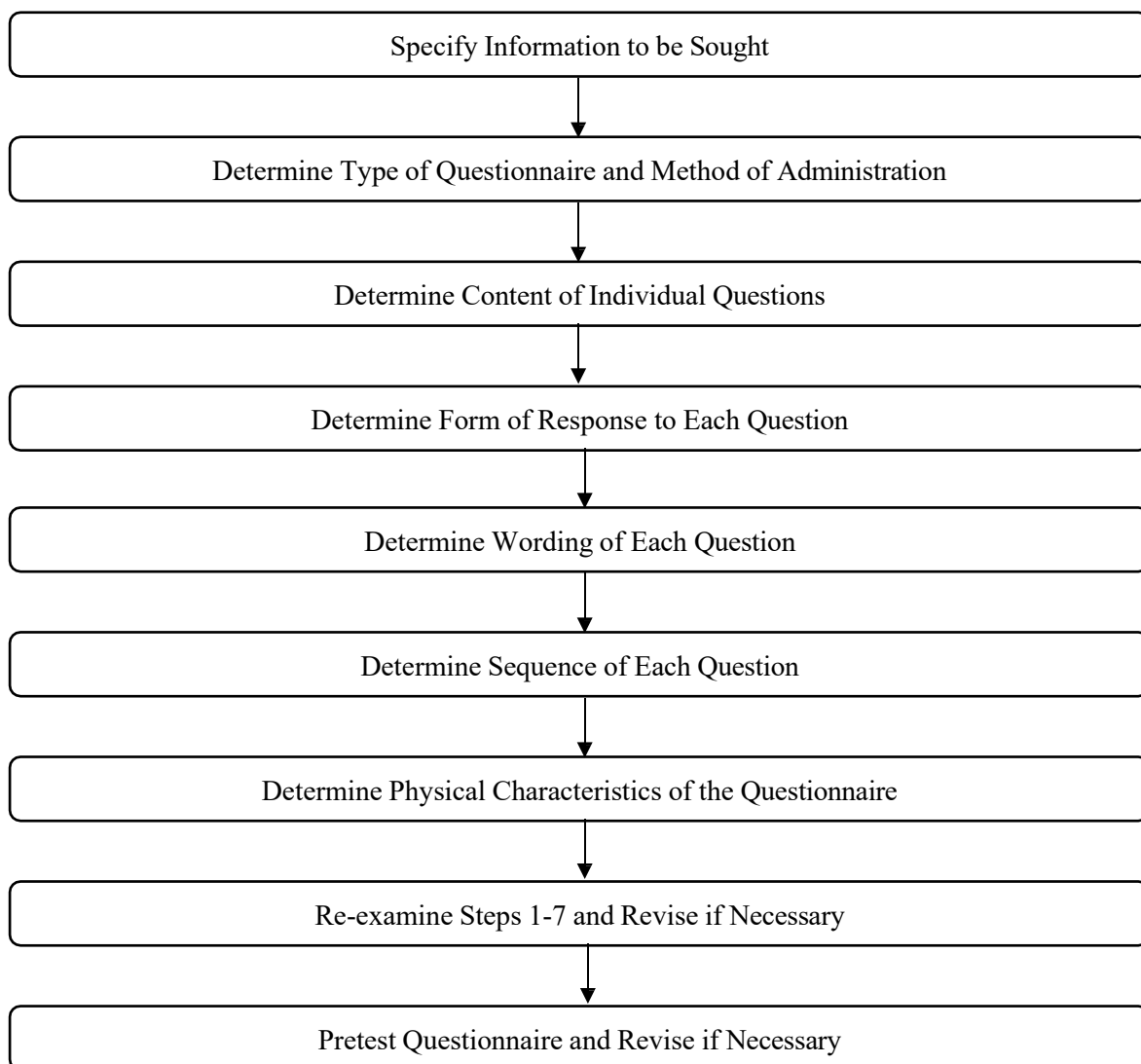


Figure 14 shows the nine-step concept, which can serve as a guide for researchers (Churchill & Iacobucci, 2002). These steps will be contextualised accordingly in the following sections in relation to this work.

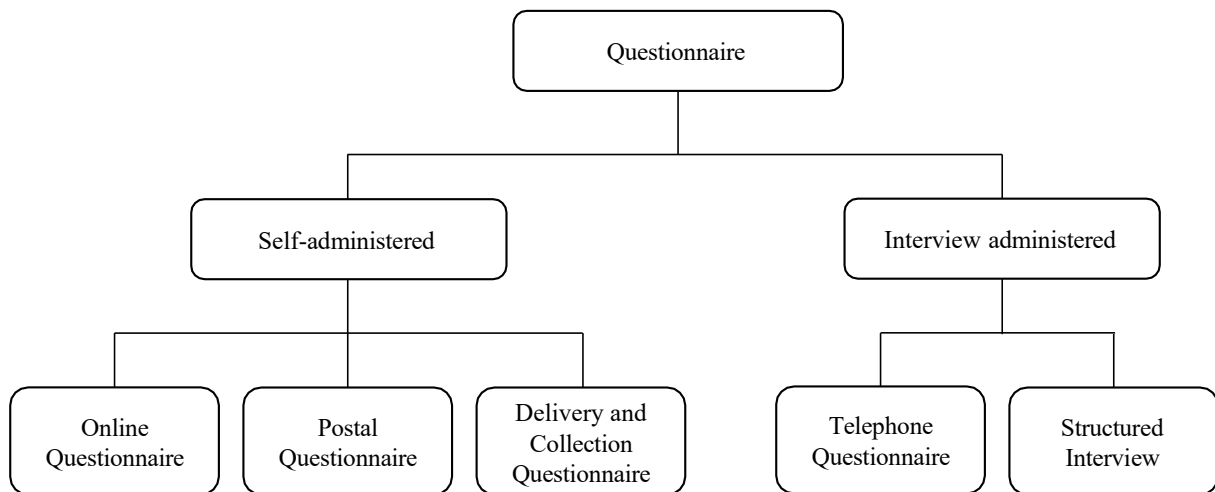


#### 4.6.2 Information Sought and Method of Administration

In the context of this thesis, the information sought is directly linked to the hypotheses, which ultimately comprise all the information that is needed. Since the thesis is both descriptive and explanatory in nature, sufficient prior knowledge is required to derive the specific hypotheses for the study (Churchill & Iacobucci, 2002). In this case, this knowledge was established by the theoretical foundation of TCT, RBV and ERBV to determine the hypothesis constructs, namely vertical integration through M&A (backward integration), asset specificity, competence, uncertainty, transaction frequency, VRIN criteria of internal resources, and VRIN criteria of external resources.

Regarding the method of administration, a questionnaire can be described as a communication channel between the researcher and the respondents of the relevant population (Brace, 2018). As Figure 15 illustrates, there are usually five types of questionnaire: online, postal, delivery and collection, all of which refer to self-administered questionnaires, together with telephone questionnaires and structured interviews, which can be categorised as interviewer-administered (Saunders et al., 2019).

Figure 15: Types of questionnaires (Source: Saunders et al., 2000, p. 280)



For this study, data were collected through a self-completion questionnaire, which was designed to be completed by the respondents themselves, with little control of this by the researcher (Brace, 2018).

A cover letter emphasised the purpose of the questionnaire, highlighting the need for cooperation. It was clearly stated that the anonymity of the respondents was guaranteed. To increase the response rate, it is important to provide an incentive. If the interest in the survey is high, then an appropriate incentive can be providing the participants with the results once the data have been collected and analysed. A lack of interest and incentive is likely to lead to response rates below 40 per cent (May, 2011). The study aimed at identifying purchasing professionals (see section 4.7.1 on ‘Defining the population’), who are most likely to show interest in the topic. The results were then provided to all the respondents as an incentive.

The participants were asked to complete the survey via the internet, so an online questionnaire was employed. This method is advantageous when it comes to accuracy and reduces omissions caused by data entry errors (Boyer, Olson, Calantone, & Jackson, 2002).

### 4.6.3 Constructs and Measures

The contents of the individual questions were developed according to the discussion of the TCT, RBV and ERBV theories in Chapter 2 and on the basis of the constructs derived from these in Chapter 3. The constructs were vertical integration, asset specificity (core competences), environmental uncertainty, transaction frequency, competences and resources.

The process of formulating the questions was supported by the notion of ‘descending the ladder of abstraction’ (de Vaus, 2002). This method helps to transform a research problem into measurable variables while descending from the broad concept down to the dimensions, indicators and variables. This means that the questionnaire was based on the literature review and the predominant theories that were used to derive the hypotheses and answer the research question (de Vaus, 2002). The measures for the research question variables, in relation to the determinants that impact vertical integration through mergers and acquisitions from a supply chain perspective with suppliers, were derived from the theories of TCT, RBV and ERBV. Tables 5, 6 and 7 illustrate the measures developed for the actual content of each question.

These measures originated from various sources. Most were adopted from other studies and then adapted to the questions of this thesis. Only the measures for ‘non-substitutable resources’ were not adopted from another study, but those for ‘inimitable resources’ were adapted to measure non-substitutable resources. This is due to the fact that there appear to be few previous studies which have empirically investigated non-substitutability (Markman, Espina, & Phan, 2004). Similarly, the author of this thesis was unable to find any empirical research on this cornerstone condition of RBV (Peteraf, 1993). Nevertheless, in order to reflect this variable as a measure, the corresponding adaptation of inimitability was used. The other measures used in this thesis and their origin are outlined below.

The dependent variable of vertical integration was measured on the basis of hypothetical choices that have fewer weaknesses than one would expect and were therefore considered as

valid indicators (Whyte, 1994). The overriding weakness of hypothetical choices is that a normative model of rational choice does not necessarily provide a satisfactory basis for a descriptive theory of decision-making (Whyte, 1994). The most common problem with such normative theories has been described as the problem of preference reversal, which indicates a discrepancy between an individual's preferences and choices (Slovic & Lichtenstein, 1983). Nevertheless, the hypothetical choices approach for this thesis is appropriate, since future integration intentions can be measured in this way. Moreover, despite their bounded rationality, economic actors are able to calculate in advance the efficiency consequences of different modes of governance; that is, they can develop preferences for different forms of governance based on the evaluation of transactions and compare them accordingly. Four items (see Table 7) indicating the intent to integrate a certain supplier in the future were developed.

The measures of the independent variable of asset specificity were adapted from previous research in the relevant empirical context. Points 5, 6 and 9 were adopted and adapted from Berthon et al. (2003), Heide and John (1992) and Gulbrandsen et al. (2009), while points 7 and 8 were adapted from Zaheer and Venkatraman (1995) and Gulbrandsen et al. (2009). These five points reflect the specificity of the assets and capture the extent of supplier-specific adjustments and knowledge gain.

The measures (items 10-14) for environmental uncertainty were taken from Gulbrandsen et al. (2009) and were adapted as they conducted a very specific study on maintenance activity, while this study focuses more generally on a firm's suppliers and their products and services.

Regarding transaction frequency, the studies of Murray et al. (1995) and Murray and Kotabe (1999) provided easily transferable measures for item 15, while item 16 is an adaptation from the study of Maltz (1994). In order to define a set of items for the VRIN criteria, the measures (items 15-18) dealing with valuable and rare resources were adapted from Newbert

(2007, 2008), while for the variable of inimitability (items 19-22), the study of Autio, Sapienza and Almeida (2000) was referred to.

As mentioned above, no adaptable measures for non-substitutability were found in the literature, therefore items 25-28 were derived from measures of inimitability. Points 27-29 are taken from the study by Lin and Wu (2014), who developed three measures that refer in their entirety to the VRIN criteria, which were adopted and adapted for this study accordingly. These three items were then also used in a slightly modified version to examine the VRIN criteria for the supplier base of the firm's supplier (items 24-36). Since it can be assumed that the supplier's supplier is further away from the interviewees than their direct suppliers, it is assumed that the superordinate questions, adapted from Lin and Wu (2014), can be answered better and more feasibly than the more detailed questions (items 17-26).

According to the literature review, empirical study of the closeness of competences has to date only been conducted by Gulbrandsen et al. (2009). The measures developed by them were also adopted for this work with minor adjustments.

Firm size and age were used as control variables, with firm size being the total number of employees (Lazzarini, Miller, & Zenger, 2008) and firm age measured as the number of years that have passed since the firm was established (Hui et al., 2013).

The dependent variable of backward integration was measured on the basis of hypothetical choices. According to Whyte (1994), measures of such choices are valid indicators and have fewer weaknesses than might be apparent at first glance. For example, the criticism that respondents have little incentive to answer hypothetical questions correctly has been investigated previously (e.g., Grether & Plott, 1979; Grether, 1980; Slavic & Lichtenstein, 1983). The evidence suggests that systematic errors are not eliminated by the introduction of substantial incentives and, as in the case of the phenomenon of preference reversal, may even be stronger in their presence (Grether & Plott, 1979). Incentives restrict attention and increase the degree of deliberation (Tversky & Kahneman, 1986). For example, if one assumes that the

frequency of transactions or the inimitability of a supplier is relevant to decision-making processes, it is not obvious how incentives would change this assumption.

Moreover, this hypothetical decision approach is very well suited to this research for two reasons. First, from the RBV-based perspective, the growth of firms can be attributed to the acquisition of external resources that will generate competitive advantages (Prahalad & Hamel, 1990; Penrose, 1959), so future intentions to integrate these resources through M&A can be examined. Second, Williamson (1985) assumes that, despite bounded rationality, economic actors are able to calculate the efficiency consequences of different forms of governance in advance, so they are also able to compare and develop preferences for different forms of governance based on the assessment of a particular transaction. As explained earlier, backward integration through M&A is a form of vertical integration (Hill & Jones, 1989), so in this case the measures based on Gulbrandsen et al. (2009) were used adaptively for this.

Tables 7, 8 and 9 list the constructs on which the hypotheses were based, together with the relevant measures.

**Measurement of the dependent variable:**

Table 7: Measures of the dependent construct (source: author)

<b>Construct</b>	<b>Measures</b>	<b>Source</b>
<b>Backward integration through M&amp;A</b>	<ol style="list-style-type: none"> <li>1. We are considering taking over the responsibility for the creation of the supplier's products or services internally through the implementation of a merger or acquisition.</li> <li>2. If the long-term need for these products or services can be foreseen, these products or services will be created within our own organisation through a merger or acquisition.</li> <li>3. It is very likely that our company will perform the activity internally in the future through a merger or acquisition.</li> </ol>	Gulbrandsen et al., 2009

**Measurement of the independent variables:**

Table 8: Measures of the independent constructs (source: author)

<b>Construct</b>	<b>Measures</b>	<b>Sources</b>
<b>Asset Specificity</b>	<ol style="list-style-type: none"> <li>4. Employees handling the relationship with the supplier need specific skills to manage it.</li> <li>5. During the cooperation we had to learn about several aspects of the supplier's operations.</li> <li>6. Our firm has spent a significant amount of time acquiring knowledge concerning the supplier's technical or service-related standards.</li> <li>7. Our company has used specific resources (personnel, physical, site-related or intangible) in tailoring procedures or routines in connection with this particular cooperation.</li> <li>8. Our firm has spent resources on training and development of the supplier's personnel during this collaboration.</li> </ol>	<p>Berthon, Pitt, Ewing and Bakkeland, 2003</p> <p>Gulbrandsen et al., 2009</p> <p>Heide and John, 1992</p>
<b>Environmental Uncertainty</b>	<ol style="list-style-type: none"> <li>9. The availability of alternative suppliers for these products or services is uncertain.</li> <li>10. Uncertainty regarding the quality of these products or services is a problem in this market.</li> <li>11. The market in which we buy these products or services is complex.</li> <li>12. The market supply for these products or services is unstable.</li> <li>13. Prices for these products or services are volatile.</li> </ol>	Noordewier, John, & Nevin, 1990

<b>Transaction Frequency</b>	<p>14. The frequency of transactions in sourcing the same products or services with respect to this supplier is high.</p> <p>15. Compared to other suppliers, the order frequency with this supplier is high.</p>	<p>Murray et al., 1995</p> <p>Murray and Kotabe, 1999</p> <p>Maltz, 1994</p>
<b>VRIN Resources of the Supplier</b>	<p>16. Given the resources the supplier possesses and has access to, they are capable of exploiting business opportunities and/or neutralising business threats.</p> <p>17. Compared to suppliers with similar resources, this supplier has a value-creating strategy not implemented by a large number of other suppliers.</p> <p>18. We can easily learn the core technology or the way the supplier's service is produced during normal operations.</p> <p>19. We can easily learn the supplier's core technology or the way the service is produced by observing their production/creation process.</p> <p>20. It would take a long time for us to learn the supplier's core technology or the way the service is produced.</p> <p>21. It is easy to copy or imitate the supplier's core technology or the way the service is produced.</p> <p>22. We can easily substitute our supplier's core technology or the way the service is produced during normal operations.</p> <p>23. We can easily substitute our supplier's core technology or the way the service is produced by observing their production/creation process.</p> <p>24. It would take a long time to substitute the supplier's core technology or the way the service is produced.</p> <p>25. It is easy to substitute the supplier's core technology or the way the service is produced.</p> <p>26. The supplier's specialist know-how is above the industry average.</p> <p>27. The supplier's reputation is above the industry average.</p> <p>28. The supplier's cooperative alliance experience is above the industry average.</p>	<p>Newbert, 2007, 2008</p> <p>Autio, Sapienza, &amp; Almeida, 2000</p> <p>Lin and Wu, 2014</p>



<b>Closeness of Competences</b>	<p>29. The competence of our organisation is close to that of the supplier in delivering these products or services.</p> <p>30. The knowledge we possess in our organisation is comparable to the knowledge the supplier's employees possess in delivering these products or services.</p> <p>31. In view of the supplier's competences, those of our organisation are well suited to producing these products or services.</p> <p>32. In view of the supplier's capabilities, our routines and procedures are well suited to producing the supplier's products or services.</p>	Gulbrandsen et al., 2009
<b>VRIN Resources of the Supplier's Supplier Base</b>	<p>33. The supplier base of the supplier has specialist know-how that is above the industry average.</p> <p>34. The reputation of the supplier base of the supplier is above the industry average.</p> <p>35. The supplier base of the supplier has cooperative alliance experience which is above the industry average.</p>	Lin and Wu, 2014

### Measurement of control variables:

Table 9: Measures of the control variables (source: author)

Firm Size	Firm size is the log of the total number of employees.	Poppo and Zenger (1998); Lazzarini, Miller, and Zenger (2008)
Firm Age	The number of years which have elapsed since the establishment of the business.	Hui et al. (2013)

After the measures have been developed, it is necessary to create a structure for the possible responses, which will be discussed in the following section in more detail.

#### 4.6.4 Form, Wording and Sequence of Questions

Responses can be presented and formulated in two ways: open-ended or closed (Fowler, 2013). In contrast to open-ended responses, closed ones provide a list of possible and acceptable answers from which the respondent can choose (Fowler, 2013). The closed response can contain

a multichotomy (a division into three or more parts), a dichotomy (a division into two parts) or a scale (Churchill & Iacobucci, 2002).

The advantages of open questions are the use of the respondents' own terms, the consideration of unusual answers and their usefulness for exploring new areas (Bryman & Bell, 2015). “This is less valid than open-ended questions because the choices might be restrictive but is more reliable because the form of the questions and answers is set, so research is more replicable” (Guthrie, 2010, p. 133). Following this statement, the advantages of closed questions, on the other hand, are reliability in questionnaire performance, reliability in the interpretation of answers and the possibility of obtaining answers that are more conducive to analysis (Fowler, 2013).

Based on these advantages, the questions in our survey are closed, with predetermined options for the respondent. Considering measurement scales, the questions attempt to measure on an interval level, utilising one-to-five Likert responses, in which the researcher questions the respondents about the extent to which they agree or disagree with a statement or a series of statements (Saunders et al., 2019). The main advantage of the Likert scale over others (such as the Thurstone or Guttman scales) is that it is relatively easy to develop the questionnaire in such a way that the system for categorising the answers is represented (Robson, 1993).

With regard to the wording of the respective questions, and according to Churchill and Iacobucci (2002), an attempt was made to formulate them in an easy and clear way, using simple words and avoiding ambiguous words, leading questions, implicit alternatives, generalisations, estimates and duplicate questions. One of the major factors causing problems in data quality is the wording of questions, as minor differences in wording or the framing of the questions can produce completely different answers (Gillham, 2008). An appropriate way to address this problem is piloting, which also adds to the reliability of the overall questionnaire. Piloting the questions is about ensuring the words are right by trying them out on different kinds of people (Gillham, 2008). As recommended by Gillham (2008), the list of questions was tested on a

group of five people outside the field of specialism; that is, they were not procurement professionals. Their special knowledge, language and jargon would be obstructive to writing a questionnaire in plain language (Gillham, 2008). Once the draft was revised based on the feedback from the non-specialists, the same procedure was repeated with five procurement professionals who were not respondents in the final questionnaire. In addition, the actual wording was checked with two supervisors from the University of Gloucestershire.

The sequence of questions should be designed in such a way that general ones should be asked first, followed by more specific ones (Ghauri & Grønhaug, 2020). This was observed in the questionnaire for this study.

#### 4.6.5 Translation of the Questionnaire from English to German

Due to the fact that the survey was conducted in Germany, it was advisable to translate the questionnaire from English into German in order to create a better understanding for the potential recipients. For studies in an international context, translation plays an important role and it is crucial to produce one in which the meaning of the questions before and after the translation is the same (Saunders et al., 2019).

One of the most commonly used methods is that of back translation (Behr & Shishido, 2016); that is, a document that was previously been translated into another language is translated back into the original language (Brislin, 1970). However, this method has its limitations, such as possible differences in language use between bilingual and monolingual translators, as well as the fact that back translations are sometimes merely literal translations from one language to another without accurately reflecting the meaning behind the statements (Douglas & Craig, 2007; Wolf, Joye, Smith, & Fu; 2016).

In order to counteract these possible weaknesses of back translation, parallel translation was chosen as the basic method in this study. This has been advocated as the preferred method

for achieving meaning equivalence in a survey; two translators are used to produce a translation, the results are compared, the differences discussed, and the most appropriate translation is used (Behr & Shishido, 2016). Attention has also been paid to taking into account disciplinary expertise and cultural knowledge in translations in an international context (Behr & Shishido, 2016; Douglas & Craig, 2007), which can also be described as extended parallel translation.

This type of parallel back translation was conducted for this study by two translators working independently of each other, who translated the questionnaire separately from German into English. Before they completed the parallel translation, the questionnaire was translated from English into German by a bilingual SCM manager from the author's corporate network. One of the translators who made the parallel translation is a publicly appointed and sworn translator of documents in English for a federal state in Germany and the other is a bilingual academic who completed his MBA at a prestigious business school in Rotterdam. The two versions were then discussed at a meeting with the Chief Procurement Officer (CPO) of a major international company in Germany who was familiar both with the terminology used in the country's procurement and supply chain organisations and with the cultural specifics. Differences in wording between the versions were discussed and changes made to take account of any suggestions made by those involved in the translation process and ultimately to ensure that the statements were accurately reflected and that the intended meaning was properly conveyed. The translated questionnaire was then tested in a pilot study.

#### 4.6.6 Physical Characteristics and Pretesting

As explained above, the study employed an online questionnaire sent by email and therefore no further elaboration or considerations of its physical characteristics are made here. Emphasis is placed on the pretest phase, which according to Churchill and Iacobucci (2003) is crucial for the final preparation of the questionnaire.

As recommended by Gilham (2008), pretesting (or piloting) the study can be subdivided into two stages. In the first stage, at least three people similar to the target group will be asked to test the questionnaire. In this case, the testers completed the survey in the same way that it would eventually be completed, online, and thought out loud while doing so. All the comments were then collected and used for the revision.

In this study, five people from the supply chain organisation of the company where the author of the thesis works were initially interviewed to check which questions were unclear or misleading; during the process they commented about the stumbling blocks faced while completing the questionnaire. It emerged that three of those surveyed hesitated when it came to questions 24 to 27, which deal with the substitutability of the core technology of the products or the way services are produced. The issue was clearly their similarity to the previous questions 20 to 23.

The following text was therefore included in the questionnaire for clarification: ‘The following questions 24 to 27 differ from the previous four questions (20 to 23) only in that they do not deal with the learnability/imitability but with the substitutability of the core technology of the products or the way in which services are produced’.

The same three people also noted that the difference between questions 31 to 33 and the previous questions 28 to 30 was not immediately clear. Both sets of questions deal with the VRIN construct, with 28 to 30 referring to the supplier and 31 to 33 to the supplier base of the supplier. In order to deal with this issue, the following statement was added to differentiate between the two sets and to make the respondents aware of the difference between the questions: ‘Questions 31 to 33 correspond to the previous three questions (28 to 30) but they refer to the supplier base of the supplier’.

With these adjustments, a pilot study was conducted in the second phase with a higher number of respondents, whose feedback was used to further develop the questionnaire

(Gillham, 2008). The study was therefore sent to 80 people working in supply chain organisations in the author's network, with 15 completed questionnaires returned.

No questions were skipped, but some of those participating in the pilot study gave qualified feedback on specific questions, which they had been asked for in the course of the pilot study. This resulted in the following changes:

With regard to question 10, in contrast to question 9, it was not immediately clear to some participants what resources were involved. In order to avoid any misunderstandings, the following change was made. Before the pilot, the text read 'Our company has used specific resources to adapt its own procedures and/or routines in the context of the cooperation with this supplier'. After the pilot, this was changed to 'Our company has used specific resources (human, physical, locational or immaterial) to adapt its own procedures and/or routines in the context of its collaboration with this supplier'.

This change was also made in question 18, which also deals with the supplier's resources. Therefore, the following change was made. Before the pilot: 'Given the resources that the supplier has or has access to, the supplier is able to exploit business opportunities and/or neutralise business risks'. After the pilot: 'Given the resources (physical, human or organisational) that the supplier has or has access to, the supplier is able to exploit business opportunities and/or neutralise business risks'. Table 10 summarises the changes to the questionnaire based on the findings of the pilot study.

Table 10: Questionnaire modifications after conducting the pilot study (source: author)

Question	Issue	Change
Q 10	Characteristic of resources not immediately obvious.	Explanation clarified by adding the following note in brackets after the word 'resources': human, physical, locational or immaterial.
Q 18		
Q 24 to 27	Similarity to questions 20-23 made differentiation with questions 24-27 difficult.	Insertion of unambiguous notes to clearly point out the differences.
Q 31 to 33	Similarity to questions 28-30 made differentiation with questions 31-33 difficult.	

Since the pilot study was conducted in German, these changes were made in the German questionnaire accordingly.

## 4.7 Sampling Design

The procedure used to identify a sample can be divided into different steps, starting with defining the population, followed by identifying the sampling frame, selecting a sampling procedure and determining the sample size (Ghauri & Gronhaug, 2020; Churchill & Iacobucci, 2002).

### 4.7.1 Defining the Population

The term ‘population’ refers to the totality of all cases that correspond to a certain specification; that is, it describes all possible observation units, which can consist of people, companies, products or countries, depending on the particular research project (De Vaus, 2013; Ghauri & Gronhaug, 2020). The population is therefore all the units from which the sample can be selected; the term ‘units’ is used because, as mentioned above, the population does not necessarily have to consist of people (Ghauri & Gronhaug, 2020).

The purposes of this research are to identify the determinants that might be beneficial for vertical integration through mergers and acquisitions from a supply chain perspective and to examine how these determinants correlate to backward integration through M&A. Therefore, the population includes all companies in different sectors located in Germany which have a supplier base with which they could potentially conduct a backward merger or acquisition. In this context, those individuals within the supply chain organisations of the companies who manage the company's suppliers or make supplier-related decisions play an important role. These include procurement managers, supply chain managers, chief procurement officers and supply chain-related consultants.



#### 4.7.2 Sample Frame

The sample can be understood as the part of the population that is selected for a study to act as a subset of it. The type of selection method is divided into probability or non-probability approaches, both of which are explained below (Ghauri & Gronhaug, 2020). The sampling frame describes the listing of all the units in the population from which the sample is selected (Ghauri & Gronhaug, 2020).

The sample frame is particularly important for a probability sample to ensure that each unit has a non-zero probability of being included in the sample (Ghauri & Gronhaug, 2020). This allows the development of a representative sample for a given study in order to draw statistical conclusions about the population based on the survey. In many cases, a corresponding sample frame cannot be displayed. Against this background, the researcher then has to rely on a non-probability sample. As a result, there is a somewhat lower level of confidence in the conclusions that can be drawn about the population (Ghauri & Gronhaug, 2020).

With regard to the population, sampling frames were searched for, although unfortunately none was available that could be used for this study to represent the population to be examined. Therefore, a specific frame was created by working closely together with a renowned supply chain consulting company in Germany founded in 2007. With 700 clients, 220 employees and a group-wide revenue of over 35 million euro, they are one of the fastest growing consulting companies in relation to purchasing and supply chain optimisation for the German-speaking business sector (Kloepfel-Consulting, 2020).

Respondents were selected by job title, including purchasing manager, supply chain manager, chief procurement officer, supply chain-related consultant and equivalents. In order to receive informed answers, the respondents in the sample were expected to have experience in supply chain management functions, which was ensured by both the job titles chosen and the fact that the Kloepfel Consulting Group's target group is always companies that are facing an

SCM problem. The type of industry was not restricted in order to be as fair as possible to the population, which included all companies based in Germany that have a supplier base with which they could theoretically conduct a merger or acquisition.

Eventually, 445 potential participants working in a German location were randomly selected from the consulting group's network for the study, with these managers and decision-makers (consisting of purchasing managers, supply chain managers, chief procurement officers and supply chain-related consultants) coming from different company sizes, industries and functions in order to form an adequate reflection of the population. The determined minimum size of the sample frame will be explained in greater detail in section 4.7.4.

#### 4.7.3 Sampling Procedure

In order to compose an appropriate sample, it is necessary to set up an effective representative sampling procedure to represent the population as adequately as possible.

There are several factors that need to be taken into account in order to do this as accurately as possible. First, the population must be accurately identified; second, its characteristics must be correctly identified in order to select the representative sample and ensure that it encompasses all the major characteristics of the population; and finally, it should be sufficiently large for the purpose of analysis (Van Dalen, 1962).

As already shown, the population comprised German companies for which M&A with their suppliers would be possible in principle. The network of the supply chain consultancy used covers a wide range of different companies in terms of sector and size, a range that was appropriate for the investigation and represented an adequate and representative sample of the population.

As explained in section 4.7.2, samples were randomly selected from the consultancy network and then finally invited to take part in the survey. Since the consulting firm consults

across all industries and company sizes, the network used represented an adequate cross section. Therefore, it is a non-probability sample in the form of convenience sampling, as the existing network of an established supply chain consultancy was conveniently used. Convenience sampling is affordable, and subjects are readily available (Etikan, Musa, & Alkassim, 2016). In most cases, it is not possible to include every single subject of the population in the study, which is why most researchers justify the choice of convenience sampling (Etikan, Musa, & Alkassim, 2016), which is also the case for this study.

#### 4.7.4 Determining the Sample Size

To provide valid estimations of the parameters of the population, the type of data analysis method used should be taken into account when deciding on the sample size (Luck & Rubin, 1987). In terms of size, because of its higher response rate an online questionnaire is favoured over other methods such as a postal questionnaire (Griffis et al., 2003). A historically established rule of thumb is that in regression analysis the ratio of the number of samples to predictors should be at least 10:1 (Harris, 1985; Maxwell, 2000; Wampold & Freund, 1987). Since there are six predictors in this study, the minimum sample size (N) would thus be 60. In this context, Green (1991) established a much more ambitious rule, which also serves as a guideline in this work. According to this, the minimum sample size should be  $N > 50 + 8m$  (where  $m$  is the number of predictors) for testing multiple correlation and  $N > 104 + m$  for testing individual predictors. For this thesis, the target minimum sample size is  $N = 110$  (since  $m=6$ ).

In addition, to determine the sample size, the expected response rate plays an important role (Luck & Rubin, 1987). In supply chain studies there have been a wide range of different response rates. While Peterson (1994) found that one in three managers refused to participate in a study, Dennis (2003) estimated that the average response rate in written surveys is around

30% and that this has fallen to 25% over the last two decades. Sekaran and Bougie (2016) suggest that an appropriate response rate is around 30%. Larson (2005) observed that the aggregated response rate fell on average by 1.05% per year from 1989 to 2003.

In other research areas, response rates are even lower. In the *Journal of AIS* these were 10.2% - 37%; in the *Information Systems Research Journal* between 7% and 93.3%; in the *Journal of Management of Information Systems Quarterly* 5.7% - 100%; and in the *European Journal of Information Systems* as low as 3%, but up to 100% (Sivo, Saunders, Chang & Jiang, 2006). Griffis et al. (2003) also pointed out that the range of response rates reported in the *Journal of Business Logistics* in the period from 1997 to 2001 was only between 4.0% and 32.7%. This means that it is only possible to estimate in advance to a very limited extent how high the response rate will actually be.

However, in order to obtain an adequate sample size of a minimum of 110 responses, a response rate of 25% was assumed, as suggested by Dennis (2003); therefore, a sample size was chosen in line with the sampling frame, i.e. a minimum of 445, which would then be a sufficient sample size for the chosen data analysis procedure.

#### 4.8 Summary

This chapter has dealt with research philosophy in order to discuss and explain the philosophical position of the author. The ontological position of the thesis is characterised by a realist ontology, which is consistent with the testing of hypotheses and the quantitative analysis of the study.

The epistemological position of this thesis is the interplay of the overall research strategy, research question, research design, research genre and methods. In the study, the researcher is independent of the data to be analysed, which goes hand in hand with his

relationship with the subject being researched, as based on the researcher's standpoint, objects have a meaning and exist independently of his consciousness.

The thesis is informed by the research paradigm of positivism, which entails both the realist standpoint of the researcher and the quantitative approach of the study. The fact that the study uses the questionnaire method to test the hypotheses indicates a strong correlation with the positivist paradigm. The study uses quantitative analysis to investigate relationships based on RBV, ERBV and TCT, which are reflected in the hypotheses, and to mathematically derive, as well as to present, the resulting findings.

Descriptive and analytical (explanatory) research is employed, which is directly related to the research question dealing with the "what" and "how". Therefore, the research is not only descriptive, but also explores the research problem in more detail by applying explanatory research that specifically examines the "how" of the relationships between the variables derived from the theories and backward integration through M&A.

The cross-sectional study follows a predominantly deductive research approach, in which the hypotheses are derived from the three theories, with the aim of enriching the underlying theories with contributions.

Based on this, the rationality of the chosen paradigm, methodology and research design is discussed, relating research design, genre, research paradigm, methodology and the research question to each other, while showing that epistemological integrity is achieved.

The questionnaire design in the thesis is characterised by a self-completion online questionnaire accompanied by a covering letter in which the anonymity of the respondents is guaranteed and an incentive for participation, namely the supply of the research results, is provided.

The process of formulating questions was developed along the lines of "descending the ladder of abstraction", while a total of 32 measures (in the form of closed questions) were established based on six constructs (asset specificity, environmental uncertainty, transaction

frequency, closeness of competences, VRIN criteria, VRIN criteria of supplier's supplier base) that represent the core of the indirect variables. The direct variable (backward integration through M&A) consists of three measures, and in addition two control variables were developed, namely firm age and firm size, which are represented by two measures.

A five-point Likert response scale was chosen as the measurement scale, which was the basis for developing the questionnaire in such a way that it was possible to devise a system for categorising the responses.

Due to the fact that the survey was conducted in Germany, and in order to ensure adequate linguistic quality of the questionnaire, the technique of parallel translation was used, with the participation of two translators. The results were compared, any differences were discussed with the Chief Procurement Officer of a major international company in German, and the most appropriate translation used. In addition, both a pretesting and a pilot study were conducted to ensure clarity regarding the questionnaire. The population studied comprised individuals within supply chain organisations who manage the company's suppliers or make supplier-related decisions (purchasing managers, supply chain managers, chief procurement officers and supply chain-related consultants of German-based companies). The convenience sampling technique was used and a non-probability sample of 445 potential participants was identified.

The non-probability sample was suitable for two reasons. First, the network of the renowned supply chain consultancy used represents a broad spectrum of different companies in terms of industry and company sizes in Germany, which is in line with the population; second, the respondents were expected to have experience and knowledge in supply chain management, which is reflected both by the selected professions within the sample and by the sector in which the Kloepfel Consulting Group operates, given that it is a procurement and supply chain consultancy.

In order to achieve an adequate response rate of at least 110 completed questionnaires (Green, 1991), reminder emails were sent to the participants, so that eventually between the period from 30 June 2020 to 15 September 2020, 122 completed questionnaires were collected.

## 5 Data Analysis

In this chapter, the statistical analysis and methods used in the thesis are presented. The first step involves presentation of the response rates and the second the preparation of the data; that is, the conducting of the preparation tests. Missing data, outliers, normality, linearity, reliability and validity will be discussed in this context. The descriptive statistics will then be presented and explained. Finally, the procedure for testing the hypotheses will be outlined. At the end of the chapter, the analyses and their results will be summarised.

### 5.1 Questionnaire Response Rate

The research was conducted in supply chain departments of companies from different industries through an online survey over the period 30 June 2020 to 15 September 2020. The unit of analysis was represented by managers who were working within a supply chain organisation during this period.

A total of 445 managers and decision makers from supply chain management departments (also including procurement and logistics) were surveyed. The data collected from the voluntary participants were collected through 40 items to be completed within the questionnaire. These items constituted six constructs, which in turn represented the research model of the study. The survey was distributed exclusively via an online questionnaire.

By the end of the distribution period, a total of 122 questionnaires had been successfully returned, which corresponds to a response rate of 27.4%. After the first review of these, all appeared to be usable, therefore all 122 were entered into SPSS for further analysis. As will be explained in the following section, six questionnaires were excluded because they did not meet the criteria for missing values, as in these cases more than 5% of the items were missing from



the respective questionnaire. Therefore, in the end 116 questionnaires were considered for further analysis, representing a total response rate of 26.1 %.

This rate can be considered adequate, as Sekaran and Bougie (2016) suggest that an appropriate response rate is around 30%, while Dennis (2003) suggests that 25% is adequate. The advice of Sekaran and Bougie (2016) was followed to improve this rate. Reminder emails were sent to the volunteers to ensure that the distribution of the questionnaire and therefore the response rate was successful. As mentioned earlier in the thesis, an incentive was also offered to increase the rate because if interest is high, then making the results available once the data have been collected and analysed can be seen as a corresponding incentive (May, 2011). The study aimed to identify supply chain professionals (see section 4.7.1) who were most likely to show interest in the topic, so the results were made available to them as an incentive.

## 5.2 Data Preparation

Before further statistical tests are conducted, it is essential to screen and edit the available data in order to prepare the primary information in such a way that it can be used for further statistical tests, in order to prevent inseparable prejudices and to avoid the screening and data preparation having any influence on the results (Kline, 2011; Hair et al., 2014). The investigations of outliers, missing data and normality are presented below, and the necessary editing of the data is shown.

### 5.2.1 Missing Data

According to Hair et al. (2014), it is essential for researchers to address any lack of data, as this affects the usability and accuracy of the data to be analysed and, if not adequately addressed, it could have an undesirable effect on the generalisability of the results as well as

the statistical power; that is, the ability to recognise important effects that occur in a data set with the aid of analytical methods (Kline, 2011; Tsikriktsis, 2005).

A lack of data is therefore often a problem in quantitative research (Peugh & Enders, 2004), which according to Hair et al. (2014) is defined as any unfilled value of one or more variables, either resulting from the respondent not having answered one or more items in a survey, for example, based on insufficient information (Tsikriktsis, 2005), or resulting from a data entry error (Hair et al., 2014).

Missing data can be characterised in different ways. When the missing value of a particular variable is not linked to the responses of other variables, it is called missing completely at random (MCAR), while missing at random (MAR) occurs when the missing value is completely independent, but at the same time linked to the value of some of the other variables (De Leeuw et al., 2003; Treiman, 2014). Missing not at random (MNAR) means that the missing value is related to the true value of the variable itself; that is, the value of the missing variable is linked to why it is missing (De Leeuw et al., 2003; Treiman, 2014).

The handling of missing data can be solved by a four-step approach (Hair et al., 2014). First, the type of missing data is determined; the extent of the missing data is then assessed; and in the third step, the randomness of the missing data is analysed in order to determine the imputation method to be used in the final step. There are two main approaches to the treatment of missing data (Tabachnick & Fidell, 2013). The simplest is to delete incomplete variables or cases, which is recommended when the deletion process does not have a significant negative impact and when there are only a few cases or variables that are affected. The second option is to estimate and replace the missing values, using different variants such as mean value, regression and multiple imputation. The first variant leads to a reduction in sample size, so in general the second technique, if applicable, is preferred as it leads to less distortion of the results (Treiman, 2014).

The missing data were identified by coding each unanswered item with the value "9" and declaring it as a missing answer, thus specifying the missing answers for each variable (Treiman, 2014). First, an analysis of the missing values was made to determine the pattern and percentage of the missing data (Tabachnick & Fidell, 2013). In the course of this analysis, 24 cases of missing data were analysed within the 122 completed surveys, of which six were excluded for further analysis as the level of missing data was higher than 5%. The analysis also showed that for all the other cases with missing data, less than 5% of the data were missing (also in relation to the respective variables), therefore they could be treated with one of the methods mentioned above, since under these conditions all of them provide very similar results (Tabachnick & Fidell, 2013).

The mean method was applied, so that in the remaining 18 cases the missing data could be compensated for by replacing each unanswered item by the total mean value of the item from the completed cases (Hair et al., 2014; Treiman, 2014). Therefore, a sample of 116 usable cases was available for further investigation.

### 5.2.2 Outliers

An outlier is a case with an extreme value related to one variable, or an unusual combination of values related to a combination of two or more variables (Tabachnick & Fidell, 2013); that is, a unique combination of values across several variables, with the observation standing out from the others (Tabachnick & Fidell, 2013; Hair, 2014). There are two types of outlier: univariate and multivariate. Multivariate outliers are data with extreme values that refer to several variables and thus reflect the investigation of two or more different variables, while univariate outliers are data that refer to a single variable (Garson, 2012). Many different factors can cause outliers to occur, such as errors in data collection, errors in data entry or errors in sampling (Osborne & Overbay, 2004). In order to reduce the number of outliers, special efforts

were made by the researcher in this study to ensure that the data were entered correctly; the pilot study in particular was very helpful in this case, as explained earlier in the study.

Univariate outliers can be easily identified by examining the frequency distributions of z-scores and employing graphical methods such as histograms and boxplots (Kline, 2011; Tabachnick & Fidell, 2013). In the thesis questionnaire, a five-point Likert scale was used (except for the control variables); therefore, no univariate outliers were identified, as all the variables ranged from "strongly disagree" to "strongly agree", which can become outliers as they are the extreme points of the scale. Nevertheless, this is not a significant problem, as respondents' opinions may vary on a given issue.

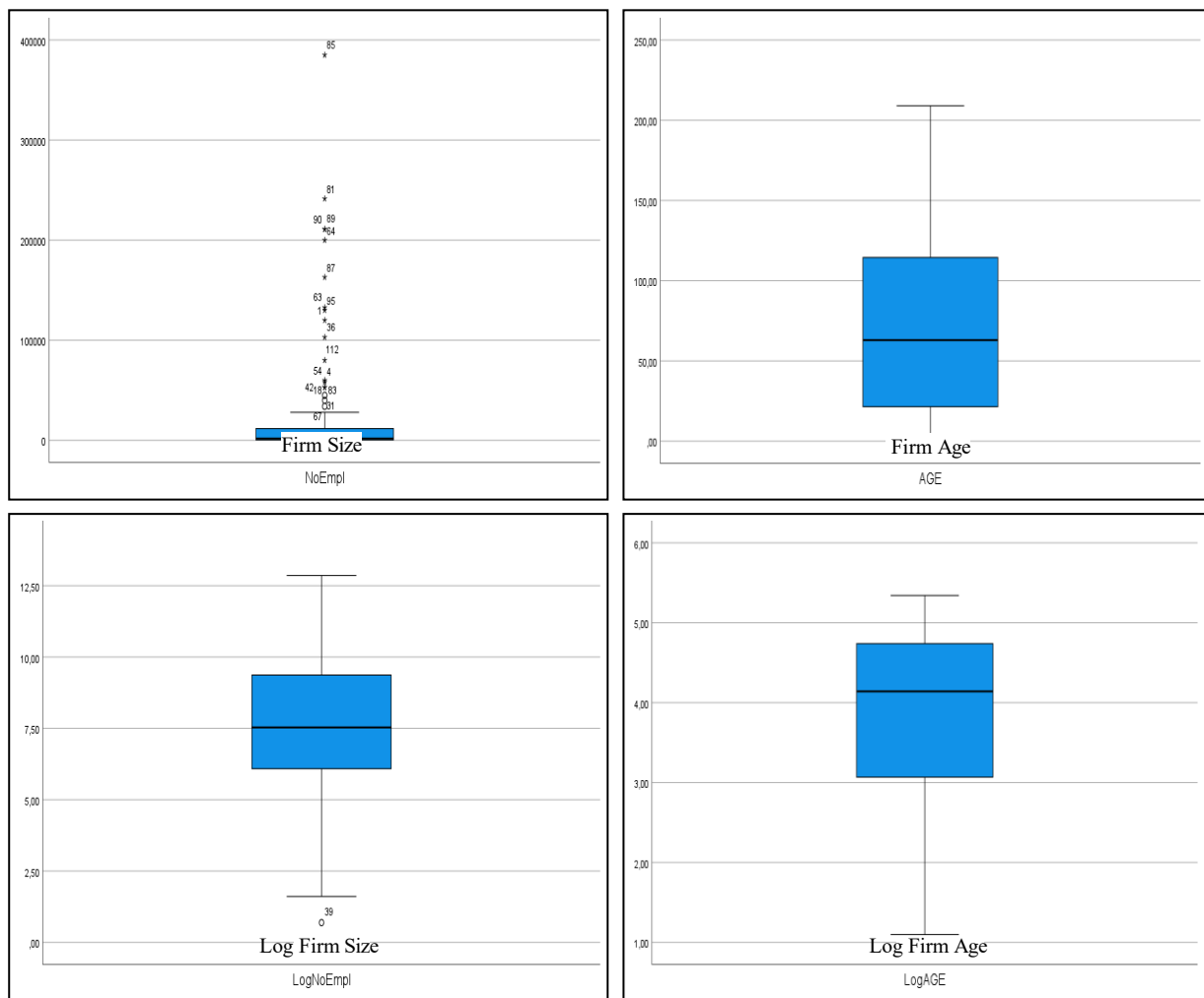
Multivariate outliers can be identified using different analyses, such as standardised residuals, the Mahalanobis distance, the leverage statistic, or Cook's distance (de Vaus, 2002). The Mahalanobis distance in particular is recommended by many authors as a suitable diagnostic method (Hair et al., 2014; Kline, 2011; Tabachnick & Fidell, 2014), measuring the distance from the mean centre of each observation in multidimensional space (Hair et al., 2014). In this research, multivariate outliers considered as sets of variables were examined. A significance test with Mahalanobis distance was performed using a level of  $p < 0.001$  (Hair et al., 2014; Tabachnick & Fidell, 2013; Kline, 2011).

As expected, some multivariate outliers were identified because it is very unlikely that the data are completely clean (Filzmoser, 2005; Tabachnick & Fidell, 2013). Only a few random outliers were identified, but these were within the acceptable range, as they can be declared to be non-critical, as all their values were above a p-value of 0.005 or 0.001 (Tabachnick & Fidell, 2013). Therefore, the outliers were not removed from the dataset because on one hand the number of cases was within the acceptable range and at the same time they did not show any critical values, and on the other, they did not occur in groups, so these individual study cases were found to be an actual part of the sample and a reflection of reality (Tabachnick & Fidell,

2013). In addition, other related assumptions such as normality and linearity were assumed and subsequently applied.

In terms of firm age and firm size, normal probability plots and box and whisker plots were used to identify and deal with possible outliers. As shown in Figure 16, 14 cases were identified in the analysis as extreme outliers (values marked with an asterisk). To address this issue, firm size and firm age were converted to logs. As can also be seen in Figure 16, the result was that there were no longer any extreme outliers after the transformation of the values. Some scholars (e.g. Osborne & Overbay, 2004) suggest that the best way to deal with outliers is to delete them. Hair et al. (2014) contradict this, explaining that they consider that such deletion limits generalisability. Accordingly, outliers should not be deleted in order to maintain generalisability to the entire population. Furthermore, according to Kline (2011) and Tabachnick and Fidell (2013), if there are only a few outliers in a large sample, there is no problem that needs to be solved. Based on the above, all the cases were retained in this study.

Figure 16: Outliers of firm size and firm age



Source: Author's data.

### 5.2.3 Normality

In the context of a multivariate analysis, it is important to examine the normality of the data to be analysed (Hair et al., 2014). This describes the form of distribution of the data in terms of the individual metric value relative to the benchmark of normal distribution (Hair et al., 2014; Tabachnick & Fidell, 2013).

Verifying that the data correspond to a normal distribution is very important to ensure the validity of the data for subsequent analyses (Tabachnick & Fidell, 2013); otherwise,

consecutive tests could even be declared invalid, especially if the deviations from the normal distribution are significant (Hair et al., 2014).

In order to measure and illustrate the distribution of variables in terms of normality, a graphical or statistical approach can be chosen. In graphical analysis, the distribution is shown by histograms (Pett, 2016), while statistical analysis defines normality by the skewness and kurtosis of the data (Tabachnick & Fidell, 2013). In this study, the normal distribution is examined by a statistical method. In this context, skewness describes the symmetry of the data distribution and kurtosis represents the statistical value of the distribution's peakedness (Tabachnick & Fidell, 2013). According to Hair et al. (2014), normal distribution is within an acceptable range as long as the skewness value is within the range -1 to +1 and the kurtosis value within the range -3 to +3 (Hair et al., 2014). According to Kline (2011), the delta is normally distributed when the skewness value is less than 3 and the kurtosis value is less than 8.

Table 11 shows the values for skewness and kurtosis as the result of the analysis, in addition to the descriptive statistics that are available for each construct (asset specificity, environmental uncertainty, transaction frequency, closeness of competences, VRIN criteria = VRIN resources of supplier, VRIN criteria SB = VRIN resources of supplier's supplier base, and vertical integration). It is shown that all the values of skewness are in the range -1 to +1, while at the same time all values of kurtosis of the same constructs have a value between -3 to +3. Based on the frameworks proposed by Hair et al. (2014) and Kline (2011), these results are statistically acceptable or considered as normally distributed; therefore, the following analyses, based on the results of this normal distribution, can be considered valid for further investigation.

Table 11: Skewness and kurtosis values of normality

Item	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Asset Specificity	116	3.6889	0.56249	-0.644	0.225	1.005	0.446
Environmental Uncertainty	116	3.274	0.67207	-0.232	0.225	-0.129	0.446
Transaction Frequency	116	3.5756	0.80574	-0.619	0.225	0.628	0.446
Closeness of Competences	116	3.0695	0.73318	-0.168	0.225	-0.746	0.446
VRIN Criteria	116	3.5271	0.49754	-0.476	0.225	0.153	0.446
VRIN Criteria SB	116	3.2331	0.59564	-0.07	0.225	0.412	0.446
Vertical Integration	116	3.3971	0.76505	-0.292	0.225	-0.255	0.446
Valid N (listwise)	116						

Source: Author's data.

#### 5.2.4 Linearity

Linearity represents the linear relationship or related patterns between research constructs and is an important assumption in multivariate techniques (Tabachnick & Fidell, 2013; Hair et al., 2014). The absence of linearity is problematic, in that it leads to singularity and multicollinearity (Hair et al., 2014). Singularity results from redundant variables; that is, other variables combine to form an independent variable, meaning perfectly correlated relationships exist (Hair et al., 2014). Multicollinearity, on the other hand, occurs when there are very strong correlations between two or more independent variables, so that it is impossible to determine the detached influence of each individual variable on the result variable (Tabachnick & Fidell, 2013). Both singularity and multicollinearity result in an attenuation of the outcomes with respect to the relationships studied (Hair et al., 2014).

To ensure that the data to be analysed were consistent with the linearity assumptions, the study calculated the bivariate correlation matrix at the significance levels of 0.01 and 0.05



(two-tailed) to calculate the linearity of the relationships of the independent variables; that is, Pearson's correlation values. To ensure linearity between independent variables, Pearson correlation values should be below .90 (Tabachnick & Fidell, 2013). As can be seen from the results of the correlation matrix shown in Table 12, there are no problems with multicollinearity or singularity, as the highest correlation value is 0.58, which according to Tabachnick and Fidell (2013) indicates linearity between the variables.

Table 12: Correlation matrix of constructs

<b>Construct</b>	<b>Asset Specificity</b>	<b>Environmental Uncertainty</b>	<b>Transaction Frequency</b>	<b>Closeness of Competences</b>	<b>VRIN Criteria</b>	<b>VRIN Criteria SB</b>	<b>Vertical Integration</b>
<b>Asset Specificity</b>	1						
<b>Environmental Uncertainty</b>	0.250**	1					
<b>Transaction Frequency</b>	0.223*	0.062	1				
<b>Closeness of Competences</b>	0.177	0.334**	0.021	1			
<b>VRIN Criteria</b>	0.319**	0.581**	0.126	0.155	1		
<b>VRIN Criteria SB</b>	0.251**	0.270**	0.002	0.291**	0.425**	1	
<b>Vertical Integration</b>	0.441**	0.364**	0.094	0.380**	0.347**	0.345**	1

\*\*Correlation significant at the 0.01 level (two-tailed). \*Correlation significant at the 0.05 level (two-tailed).

Source: Author's data.

Further statistical evaluation of multicollinearity can be made by means of the variance inflation factor (VIF) and tolerance value, in addition to the correlation matrix shown above. Based on the results of this analysis, there is no problem if the VIF is less than 5 and the tolerance value of the same variables is greater than 0.10 (Hair et al., 2014). As shown in Table 13, the values formulated by Hair et al. (2014) support the results of the study: the highest VIF value is 1.8 and the lowest tolerance value is 0.55, therefore both are within the acceptable range.

Table 13: Correlation matrix of constructs

Independent Variable	Tolerance (1/VIF)	VIF
Asset Specificity	0.833	1.200
Environmental Uncertainty	0.598	1.671
Transaction Frequency	0.939	1.065
Closeness of Competences	0.823	1.215
VRIN Criteria	0.552	1.812
VRIN Criteria SB	0.752	1.330

Source: Author's data.

Based on the analyses performed, it can therefore be stated that the data relevant to this study are free of multicollinearity and singularity problems and therefore no further tests need to be conducted.

### 5.3 Reliability and Validity of the Research Constructs

This section is concerned with ensuring the reliability and validity of the research instrument, issues which are important in the development of any instrument (Hair et al., 2014). The results can indicate its trustworthiness and reflect the strength of the research findings (Kline, 2011). In this context, convergent and discriminant validity were tested, together with a discussion of content validity. Convergent validity can be mapped using three indicators: the factor loadings of all the constructs, the average variance extracted (AVE), and the reliability of the constructs (Hair et al., 2014). Discriminant validity is reflected by testing the correlations of the constructs by comparing them to the square root of the AVE values (Fornell & Larcker, 1981), which is discussed in more detail later in this section.

Reliability is reflected by the consistency of the results, and is measured by the reliability coefficients, also called Cronbach's alpha, indicating the average values of correlation between items within the scale (Hair et al., 2014; Kline, 2011). According to several scholars, values starting at 0.7 are considered as acceptable values, while the Cronbach's alpha coefficient

ranges from 0 to 1 (Hair et al., 2014; Tabachnick & Fidell, 2014). While high values of alpha are desirable, lower values near 0.6 are also acceptable, especially when the construct consists of only a few items (Hair et al., 2014).

In this study, internal consistency was examined using Cronbach's alpha, with the result (see Table 14) that the alpha coefficients of the six constructs, according to the previous discussion, are within the accepted range. As the table shows, the highest alpha coefficient is 0.77 for the supplier's VRIN criteria and the lowest value is 0.58 for transaction frequency, which is the construct with the fewest items and is close to 0.6, thus also within an acceptable range. The results show that, taking into account the previous discussion, the instrument used to collect data is reliable.

There are various explanations to account for low Cronbach's alpha scores (Darwish, Singh, & Wood, 2016). One of the explanations, as described above, was also given by Hair et al. (2014), who state that these scales have fewer measurement items (which is particularly the case with the construct of transaction frequency), which can result in low reliability estimates (DeShon, 1998; Gerhart, Wright, & McMahan, 2000). Furthermore, the fact that the quantitative data gathered stem from single raters may have an impact on the reliability (Gerhart, Wright, McMahan, & Snell, 2000; Huselid & Becker, 2000). If one follows the arguments of Gerhart et al. (2000) & Wright et al. (2001), the reliability of single raters can be noticeably low.

The alpha coefficient is at times also considered insufficient to determine reliability, which is due to the fact that it does not take into account all the measurement errors that occur on the basis of other sources, such as the raters themselves (Gerhart et al., 2000; Huselid & Becker, 1996).

Another factor that can lead to fairly low reliability estimates is the sample size, since lower sizes can eventually lead to a greater variability of the values being measured (Huselid & Becker, 1996). In addition, in this work, the selected supply chain organisations may have

different areas of responsibility (e.g. purchasing, internal logistics, external logistics, production planning), consequently leading to less consistency in supply chain practices and potentially reducing reliability estimates (Gerhart et al., 2000).

In addition to this reliability, which is only a general indicator of the validity of the scale (Kline, 2011), further analyses were conducted to assess the validity of the scale for the study.

### 5.3.1 Validity of the Research Constructs

Validity can be described as the degree to which a measure accurately represents what it is intended to represent (Hair et al., 2014), or in other words, it describes the accuracy of a measure in representing a particular concept (Zikmund et al., 2013). Determining validity requires consideration based on different approaches, because while a measure may be very valid for one objective, it may not be the case for another (Herman, Osmundson & Dietel, 2010). Subsequently, content and construct validity are examined and discussed in the following sections.

### 5.3.2 Content Validity

Content validity, also referred to as face validity, describes the qualitative assessment of validity with regard to the relationship between the items and their constructs, which can be ensured through the assessment of experts and specialists; pre-tests (Hair et al., 2014); and by referring to relevant literature (Bell et al., 2018). The aim of ensuring content (face) validity is to ensure that the scale items are able to measure the construct, and can be understood as a minimum requirement for ensuring validity (Sekaran & Bougie, 2016). Content (face) validity ultimately represents the degree to which the items of a scale adequately reflect the dimensions they should express (Zikmund et al., 2013; Sekaran & Bougie, 2016).

The examination of content validity in this study was conducted both through an assessment with academics, subject experts and a pilot study, as well as by referring to constructs that have already been used for research purposes in the relevant literature.

Professionals from a supply chain organisation were interviewed, with the aim of checking the items for ambiguity and misleadingness. In addition, academics who are experts in both supply chain and quantitative research methods were consulted. The respective groups were asked to check the items with regard to their connection to the respective construct and to indicate any ambiguities, which were then taken into account accordingly.

Furthermore, as described in chapter 4.6.6, a pilot study was conducted, the outcome of which was used to improve the final version. Finally, the constructs were developed in relation to items used in the literature and adapted from previous research to the relevant empirical context of this study.

In summary, the results of this procedure showed that the scale items were apparently adequately connected and able to measure the construct. Therefore, the minimum requirement of content (face) validity was established. Nevertheless, these results were primarily based on expert judgement, so the researcher used additional techniques to further examine the validity of the constructs, which will be discussed in the following section.

### 5.3.3 Construct Validity - Convergent and Discriminant

Construct validity reflects the validity of the measures of a single construct and is a suitable type of analysis to examine their underlying quality (Hair et al., 2014; Zikmund et al., 2013). While content validity is a qualitative assessment, the subsequent analysis reflects a quantitative technique, often using factor analysis tests and correlation analysis (Zikmund et al., 2013; Kline, 2011; Hair et al., 2014). In this study, two forms of construct validity were tested, namely convergent validity and discriminant validity, which are discussed below.

## Convergent Validity

Convergent validity is evaluated below using three indicators, namely factor loadings, average variance extracted (AVE) and construct reliability. The factor loading is an important indicator of validity; the value of the loadings should be greater than or equal to 0.5 (Hair et al., 2014). As can be seen in Table 12, out of 35 items, seven are below the threshold of 0.5, so were deleted accordingly and not considered in the further data analysis. The loading of the remaining items was then improved appropriately after the poorly loaded ones had been removed; that is, item 5 of asset specificity, items 1 and 3 of environmental uncertainty, items 1, 7 and 10 of the VRIN criteria, and item 4 of closeness of competences.

The removal of these constructs did not have a great effect on the corresponding factors and so all the values of the remaining factor loadings were in the acceptable range, from 0.503 to 0.744, which shows a strong link between the constructs and their factors.

In multivariate statistics, AVE is a measure of the quality of how a single latent variable (construct) explains its indicators and provides the researcher with data on the amount of variance accounted for by the construct relative to the variance due to measurement error (Fornell & Larcker, 1981). A value of 0.5 or greater is an indicator of the presence of convergent validity. In this study, the values are slightly lower in many cases, because  $AVE < .50$  means that on average the item loading is less than .07 (Hair et al., 2010); when an item loading is .71, its communality is then .50 as communality is the loading square. This also explains that while the loadings are in the acceptable range, the AVE is less than perfect ( $< 0.50$ ).

For this reason, the composite reliability was also calculated and taken into account when assessing validity, as an AVE below 0.5 can be accepted if at the same time the composite reliability is greater than 0.6 (Fornell & Larcker, 1981), meaning then that the convergent validity of the construct is still considered sufficient. Therefore, only transaction frequency is

below this value of 0.6 concerning the composite reliability but, as described earlier, it can be explained in this study and thus be classified as unproblematic.

The third indicator is the validity of the construct, which was examined, discussed and confirmed in section 5.2.5.2, together with the values of Cronbach's alpha. Taking all the results from the factor loadings, AVE and reliability together (see Table 14, the congruent validity can be mostly considered confirmed (only the transaction frequency and environmental uncertainty have lower values)).

Table 14: Convergent validity

Construct	Item	Factor Loading	Cronbach's Alpha	AVE	Composite Reliability
<b>Asset Specificity</b>	ASPT4	0.724	0.61	0.47	0.780
	ASPT3	0.625			
	<i>ASPT5 cut off</i>	<i>0.481</i>			
	ASPT2	0.709			
	ASPT1	0.683			
<b>Environmental Uncertainty</b>	ENVU2	0.644	0.65	0.34	0.602
	ENVU5	0.553			
	ENVU4	0.539			
	<i>ENVU1 cut off</i>	<i>0.482</i>			
	<i>ENVU3 cut off</i>	<i>0.458</i>			
<b>Transaction Frequency</b>	TRAFR1	0.639	0.58	0.41	0.580
	TRARF2	0.639			
<b>VRIN Criteria</b>	VRIN11	0.701	0.77	0.48	0.859
	VRIN13	0.631			
	VRIN2	0.595			
	VRIN12	0.503			
	<i>VRIN1 cut off</i>	<i>0.470</i>			
	VRIN4	0.667			
	VRIN5	0.657			
	VRIN3	0.530			
	<i>VRIN6 cut off</i>	<i>0.440</i>			
	<i>VRIN9 cut off</i>	<i>0.334</i>			
	VRIN7	0.633			
VRIN10	0.617				
VRIN8	0.614				
<b>VRIN SB</b>	VRINSB1	0.744	0.72	0.48	0.733
	VRINSB2	0.738			
	VRINSB3	0.586			
<b>Closeness of Competences</b>	CPS1	0.723	0.72	0.49	0.743
	CPS3	0.700			
	CPS2	0.678			
	<i>CPS4 cut off</i>	<i>0.407</i>			
<b>Vertical Integration</b>	VI2	0.731	0.68	0.42	0.689
	VI3	0.601			
	VI1	0.594			

Source: Author's data.



## **Discriminant Validity**

Discriminant validity occurs when measurements of different constructs using the same method do not correlate with each other or correlate only slightly. It is based on the assumption that measurements of unrelated constructs should not correlate with each other, even if the same method was used. Therefore, the method should ensure that the constructs do not correlate with each other to the extent that they measure the same thing; that is, it should confirm the distinctiveness of the constructs (Zikmund et al., 2013). In this context, Fornell and Larcker (1981) proposed a testing method using the AVE scores and the correlation coefficients of the constructs. The underlying assumption is that if the square root of the AVE for a given construct is greater than the absolute value of the standardised correlation of that construct with any other construct, then discriminant validity exists.

As can be seen in Table 13, where the bold diagonal values represent the square root of the AVE for that construct, the square roots of the AVE values are higher than any correlation value that lies below the diagonals. This is therefore an indicator that there is a reasonably acceptable level of discriminant validity.

Table 15: Discriminant validity

Construct	Asset Specificity	Environmental Uncertainty	Transaction Frequency	Closeness of Competences	VRIN Criteria	VRIN Criteria SB	Vertical Integration
Asset Specificity	<b>0.686</b>						
Environmental Uncertainty	0.250**	<b>0.583</b>					
Transaction Frequency	0.223*	0.062	<b>0.640</b>				
Closeness of Competences	0.177	0.334**	0.021	<b>0.693</b>			
VRIN Criteria	0.319**	0.581**	0.126	0.155	<b>0.693</b>		
VRIN Criteria SB	0.251**	0.270**	0.002	0.291**	0.425**	<b>0.700</b>	
Vertical Integration	0.441**	0.364**	0.094	0.380**	0.347**	0.345**	<b>0.648</b>

\*\*Correlation significant at the 0.01 level (two-tailed). \*Correlation significant at the 0.05 level (two-tailed). Diagonal elements in bold are the square root of average variance extracted  
 Source: Author's data.

#### 5.4 Descriptive Analysis of the Research Constructs

This section examines how the experts from the field of supply chain management answered the survey questions or how these are reflected in the seven research model constructs (shown in the section 4.6.3). A total of 122 questionnaires were returned from the 445 surveyed managers and decision-makers from supply chain management departments (which include procurement and logistics), representing a response rate of 26.1%, with 116 usable ones identified following the missing data analysis in section 5.2.1. The sample was selected at random from a network SCM managers and decision-makers, representing a reasonable cross-section of the population, as defined in section 4.7.1.

The constructs were asset specificity, environmental uncertainty and transaction frequency, which were derived from the transaction cost theory, and closeness of competences, the VRIN criteria and the VRIN criteria of the supplier base, as derived from the (extended) resource-based theory, together with the dependent variable, the vertical integration construct.

In the context of this analysis, descriptive analysis methods were applied. The questionnaire items, which essentially represent the measured variables, were examined with regard to mean value, standard deviation (SD) and frequency, which are presented as percentages of the response frequencies along the scale. All the items refer to responses that lie on the five-level Likert scale, 1 representing "strongly disagree" and 5 "strongly agree". This scale gave the interviewees the opportunity to express their own views on the extent to which they concurred with the statements made on the respective construct. This structure is reflected for all the constructs and measures, therefore the representative example is valid for all subsequent constructs and measures.

The following statement (in italics) prefaced the questionnaire as an introduction to the survey. It refers not only to asset specificity, but to all the constructs, as is evident from the statement wording.

*IMPORTANT: Please identify a supplier with whom you consider a merger or acquisition (M&A) to be appropriate and always refer to that supplier when responding. All subsequent statements in this questionnaire refer to the supplier you have identified*

In the following sections, the descriptive statistics for the seven constructs are discussed and explained.

#### 5.4.1 Asset Specificity

Asset specificity was measured by means of five items which, as discussed in chapter 4, were formulated as closed questions. A five-level Likert scale was used to classify the respondents' answers to each item. The advantage of such closed questions is based on their reliability in questionnaire performance and in the interpretation of the answers, allowing the

researcher to obtain answers that are more conducive to analysis (Fowler, 2013). In addition, the Likert scale is instrumental in developing a system that helps to categorise the responses (Robson, 1993).

Table 16 shows the mean value, standard deviation and percentage distribution of the response scales. The mean value of all items was between 4.07 (ASPT1) and 3.23 (ASPT5), while the overall mean value, as can be seen from Table 9 ('Skewness and kurtosis values of normality'), is 3.67, while the standard deviation of the construct amounts to 0.563.

Table 16: Responses and descriptive statistics for asset specificity of transactions

Statement	Mean	Response Scale					
		Standard Deviation	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
ASPT1	4.07	0.731	0 (0%)	5 (4.3%)	12 (10.3%)	69 (59.5%)	30 (25.9%)
ASPT2	3.97	0.893	0 (0%)	10 (8.7%)	17 (14.8%)	55 (47.0%)	34 (29.6%)
ASPT3	3.59	0.923	2 (1.7%)	14 (12.1%)	28 (24.1%)	57 (49.1%)	15 (12.9%)
ASPT4	3.57	0.918	0 (0.0%)	17 (14.8%)	32 (27.8%)	49 (42.2%)	17 (14.8%)
ASPT5	3.23	1.025	4 (3.4%)	30 (25.9%)	25 (21.6%)	49 (42.2%)	8 (6.9%)

Source: Author's data.

In relation to the first statement, ASPT1, ("Employees who manage the relationship with the supplier need specific skills to manage that relationship"), the respondents generally agreed that in relation to the supplier under consideration (a supplier with whom the respondents are considering a merger or acquisition), the employees taking care of the relationship with them need specific skills to manage it, with a mean of 4.07 out of 5 and a standard deviation of 0.731, which indicate how far the values deviate from the mean. Therefore, they broadly agree that the employees need specific skills, with 59.5% agreeing and 25.9% strongly agreeing. However, 4.3% of the respondents disagreed, although no-one strongly disagreed, while the remaining

10.3% indicated that they neither agreed nor disagreed, thus relating to a neutral score on the scale.

The respondents also agreed in principle with the second statement, ASPT2, "During the cooperation we had to get to know several aspects of the supplier's operation", indicating that the cooperation requires knowledge of several aspects of the supplier's operation. The mean value in this case is 3.97 out of 5 with a standard deviation of 0.893. The comparatively higher mean value reflects the distribution of frequencies as follows: 47% of the respondents agreed that they had to understand several aspects of the supplier's operation, while 29.6% strongly agreed. 8.7% did not agree, but none strongly disagreed, while the remaining 14.8% stated that they neither agreed nor disagreed. The majority therefore agreed with statement ASPT2.

With regard to ASPT3, the respondents largely agreed that their company spent a great deal of time acquiring knowledge of the supplier's technical or service-related standards, which is reflected in a mean match of 3.59 out of 5. The SD of .923 reflects the value of the following distribution of response frequencies expressed as a percentage. As a result, 49.1% of the respondents agreed that their company spent a significant amount of time on adopting the stated standards and 12.9% strongly agreed. On the other hand, 1.7% of the respondents strongly disagreed with the statement and 12.1% disagreed with it, while the remaining 24.1% neither agreed nor disagreed. This shows that the majority of respondents agreed that their firm spent considerable time gaining knowledge of the supplier's technical or service-related standards.

As with the previous statements, the managers from the field of supply chain management generally agreed with statement ASPT4 ("Our company has used human, physical, site-related or intangible, specific resources in adapting procedures or routines in connection with this particular cooperation"). With an average score of 3.57 out of 5 and an SD of 0.918, 14.8% strongly agreed that specific resources were used in the context of working together with the supplier under consideration. 42.6% agreed with this statement, while none stated that they strongly disagreed. 27.8 % were undecided, while 14.8% did not agree that specific resources

were used to adapt procedures or routines. This indicates that the majority of respondents agreed that their company had used specific resources (human, physical, site-related or intangible) to adapt procedures or routines in connection with this particular collaboration.

Finally, with regard to the final statement (ASPT5) related to the asset specificity construct, namely that the respondent's firm had spent resources on training and development of the supplier's personnel during the cooperation with them, the respondents were somewhat undecided. With a mean of 3.23 out of 5 and a high SD of 0.1025, many were undecided, at a percentage of 29.9%. Almost half of the respondents either agreed (42.2%) or strongly agreed (6.9%), while 3.4% strongly disagreed and 25.9% disagreed that resources were spent on training and staff development of the supplier under consideration. Therefore, the majority of the respondents either agreed or were undecided.

#### 5.4.2 Environmental Uncertainty

This construct was measured using four items (with closed statements) and the same five-level Likert scale. Table 17 shows the mean value, standard deviation and percentage distribution of the response scales. The mean value of all items was between 3.60 (ENVU3) and 2.95 (ENVU4). The overall mean value, as shown in Table 9 ("Skewness and kurtosis values of normality") was 3.27 out of 5 and the standard deviation of the construct was 0.6721.

Table 17: Responses and descriptive statistics for environmental uncertainty

Statement	Mean	Standard Deviation	Response Scale %				
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
ENVU1	3.31	1.067	6 (5.2%)	23 (19.8%)	28 (24.1%)	47 (40.5%)	12 (10.3%)
ENVU2	3.18	1.116	9 (7.8%)	25 (21.6%)	29 (25.1%)	42 (36.2%)	11 (9.5%)
ENVU3	3.60	1.029	0 (0.0%)	22 (19.0%)	27 (23.3%)	42 (36.2%)	25 (21.6%)
ENVU4	2.95	0.981	2 (1.7%)	46 (40.0%)	29 (25.1%)	32 (27.8%)	6 (5.2%)
ENVU5	3.33	1.002	2 (1.7%)	29 (25.0%)	24 (20.7%)	51 (44.0%)	10 (8.6%)

Source: Author's data.

With regard to the first statement, ENVU1, ("The availability of alternative suppliers for these products or services is uncertain"), the respondents generally agreed that the availability of the products and services of the supplier under consideration was uncertain, with a mean value corresponding to 3.31 out of 5 and a standard deviation of 1.067. In fact, 40.5% of them agreed and 10.3% strongly agreed, while 19.8% disagreed and 5.2% strongly disagreed, and 24.1% expressed a neutral opinion. As a result, the majority of respondents generally agreed that uncertainty prevailed regarding the availability of products and services from the supplier.

Statement ENVU 2, namely that uncertainty about the quality of these products or services in this market is a problem with regard to the supplier under consideration, received more support than rejection, with 36.2% agreement and strong agreement of 9.5%. The mean was 3.18 out of 5 and the standard deviation 1.116. This also reflects the partial disagreement with the statement, with 7.8% strongly disagreeing and 21.6% disagreeing, while 25.0% were undecided. Finally, there was a tendency towards agreement that there was a lack of certainty about product and service quality within the market of the supplier in question.

ENVU3 had a mean value of 3.6 out of 5 and a standard deviation of 1.029. An absolute majority agreed with the statement, namely that the market in which the products or services of

the supplier under consideration were purchased was complex. This is shown by the fact that 36.2% agreed with the statement and 21.6% strongly agreed. On the other hand, none of the respondents disagreed strongly, with 19% disagreeing. 23.3% were undecided. The complexity of the market of the suppliers under consideration was thus confirmed by the majority of respondents.

The fourth statement, ENVU4, ("The market supply for these products or services is unstable") had a mean value of 2.95 out of 5 and a standard deviation of 0.981. There is therefore an overall undecidedness among the respondents, who had the tendency to reject the notion that the market supply of the supplier under consideration was not stable. 27.8% agreed and 5.2% strongly agreed; 40% disagreed; 1.7% strongly disagreed; and the remaining 25.2% were indecisive. This indicates that the majority of respondents did not agree that there was instability in market supply.

Concerning the fifth statement, ENVU5, ("The prices of these products or services are volatile."), the respondents generally agreed that the price of the products or services of the supplier being considered was volatile, with a mean of 3.33 out of 5 and a standard deviation of 1.002. 44.0% agreed, 8.6% strongly agreed and 20.7% were unsure whether price volatility was present in the market. On the other hand, 25.0% of the respondents disagreed with statement ENVU5 and 1.7% were strongly opposed it. This shows that the majority of respondents agreed that there was price volatility in the market for the products or services of the supplier in question.

#### 5.4.3 Transaction Frequency

This construct was measured using two items and resulted in an overall mean of 3.58 out of 5 and a standard deviation of 0.8075, as shown in Table 9 ("Skewness and kurtosis values of normality").



Table 18: Responses and descriptive statistics for transaction frequency

Statement	Mean	Standard Deviation	Response Scale				
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
TRAFR1	3.54	1.003	3 (2.6%)	16 (13.9%)	30 (26.1%)	48 (41.7%)	18 (15.7%)
TRAFR2	3.61	0.921	3 (2.6%)	11 (9.5%)	29 (25.0%)	58 (50.0%)	15 (12.9%)

Source: Author’s data.

Both TRAFR1 and TRAFR2 show an absolute majority in support of the two statements.

With regard to the frequency of transactions, the first statement, TRAFR1, with a mean of 3.54 out of 5 and a standard deviation of 1.003 ('The frequency of transactions in the procurement of the same products or services in relation to this supplier is high'), showed that although just over a quarter, 26.1%, of the respondents were undecided, 41.7% agreed that in relation to the services or products of the supplier under consideration, the frequency of procurement transactions was high, with 15.7% strongly agreeing. On the other hand, 13.9% disagreed and the remaining 2.6% strongly disagreed with the high frequency of transactions.

The second statement (TRAFR2), which states that the frequency of orders placed with the supplier in question was high compared to other suppliers, was generally agreed upon by the respondents, with a mean value of 3.61 out of 5 and a standard deviation of 0.921. This is reflected in the following response frequencies: 25.0% were unclear as to whether order frequency was comparatively high, while 50.0% agreed and 12.9% strongly agreed. 9.5% did not agree, while 2.6% strongly disagreed.

#### 5.4.4 Closeness of Competences

The closeness of competences (CPS) was measured using four items, with the mean of the four measures ranging from 3.27 (CPS3) to 2.94 (CPS2). The overall mean was 3.07 out of 5 and the standard deviation of the construct was 0.7332, as shown in Table 9.

Table 19: Responses and descriptive statistics for closeness of competences

Statement	Mean	Standard Deviation	Response Scale				
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>CPS1</b>	3.03	1.051	5 (4.3%)	41 (35.3%)	22 (19.0%)	42 (36.2%)	6 (5.2%)
<b>CPS2</b>	2.94	1.032	7 (6.0%)	40 (34.5%)	26 (22.4%)	39 (33.6%)	4 (3.4%)
<b>CPS3</b>	3.27	0.940	5 (4.3%)	18 (15.7%)	39 (33.9%)	47 (40.9%)	6 (5.2%)
<b>CPS4</b>	3.04	0.964	4 (3.4%)	37 (31.9%)	27 (23.3%)	46 (39.7%)	2 (1.7%)

Source: Author's data.

The first statement, CPS1, which shows the closeness of the organisation's competence to that of the supplier, that is, the competence of the supplier in providing products or services, has a mean value of 3.03 out of 5, with a standard deviation of 1.051. The respondents were therefore generally undecided in that there was little difference either in favour or against the statement. This is reflected in the following percentage values of the response frequencies: 36.2% agreed and 5.2% strongly agreed, while 4.3% strongly disagreed and 35.3% disagreed, with the remaining 19.0% of respondents undecided.

With regard to the second statement, CPS2, there was a general tendency to be somewhat indecisive, namely that the knowledge the respondents had in their organisation was comparable to that of the supplier's employees when supplying products or services. This is expressed by a mean value of 2.94 out of 5 and a standard deviation of 1.032. 33.6% agreed and 3.4% strongly agreed that the knowledge in the organisation was comparable to that of the

supplier, while 34.5% disagreed and 6.0% strongly agreed, with the remaining 22.4% undecided. This shows that overall there was no clear tendency to either disagree or agree.

The descriptive analysis of the third statement (CSP3), that the competences of the organisation of the supply chain executives interviewed (with regard to the competences of the supplier) were well suited to producing their products or services themselves, with a mean value of 3.27 out of 5 and a standard deviation of 0.940. This indicates that there was a general tendency towards agreement, but not a distinct one. This is reflected in responses as follows: 40.9% agreed and 5.2% strongly agreed that the competencies were well suited to this specific product or service creation; 15.7% disagreed, 4.3% strongly disagreed, while the remaining 33.9% were undecided. This shows that the majority, but not an absolute majority, of the respondents agreed with statement CPS3.

Finally, in relation to the fourth statement, CPS4, ("Given the supplier's capabilities, our routines and procedures are well suited to produce the supplier's products or services."), the respondents generally tended to show indecision, as indicated by the mean score of 3.04 out of 5, with a standard deviation of 0.964. 31.9% of the respondents disagreed, 3.4% strongly disagreed and 23.3% were undecided, while 39.7% agreed and 1.7% strongly agreed that their own organisation's routines and procedures were well suited to creating the supplier's products or services.

#### 5.4.5 VRIN Criteria

The VRIN criteria (VRIN) was measured using four items, with their mean ranging from 3.83 (VRIN 7) to 3.17 (VRIN 13). As shown in Table 9 the overall mean was 3.53 out of 5 and the standard deviation of the construct was 0.49754.

Table 20: Responses and descriptive statistics for VRIN criteria

Statement	Mean	Response Scale					
		Standard Deviation	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
VRIN1	3.62	0.920	2 (1.7%)	14 (12.1%)	25 (21.6%)	60 (51.7%)	15 (12.9%)
VRIN2	3.27	0.972	2 (1.7%)	30 (25.9%)	26 (22.4%)	51 (44.0%)	17 (6.0%)
VRIN3	3.59	0.987	2 (1.7%)	18 (15.5%)	23 (19.8%)	55 (47.4%)	16 (15.5%)
VRIN4	3.25	0.978	4 (3.5%)	27 (23.5%)	25 (21.7%)	54 (47.0%)	5 (4.3%)
VRIN5	3.60	0.976	1 (0.9%)	19 (16.5%)	24 (20.9%)	52 (45.2%)	19 (16.5%)
VRIN6	3.58	0.910	3 (2.6%)	12 (10.4%)	26 (22.6%)	63 (53.9%)	12 (10.4%)
VRIN7	3.83	0.755	2 (1.8%)	6 (5.3%)	9 (7.9%)	88 (75.4%)	11 (9.6%)
VRIN8	3.38	0.820	1 (0.9%)	18 (15.5%)	37 (31.9%)	56 (48.3%)	4 (3.4%)
VRIN9	3.72	0.929	0 (0.0%)	17 (14.7%)	19 (16.5%)	59 (50.9%)	21 (18.1%)
VRIN10	3.64	0.918	2 (1.7%)	12 (10.5%)	24 (21.1%)	61 (52.6%)	16 (14.0%)
VRIN11	3.76	0.776	0 (0.0%)	6 (5.2%)	34 (29.3%)	58 (50.0%)	18 (15.5%)
VRIN12	3.44	0.858	1 (0.9%)	15 (12.9%)	42 (36.2%)	48 (41.4%)	10 (8.6%)
VRIN13	3.17	0.968	6 (5.2%)	22 (19.1%)	40 (34.8%)	41 (35.7%)	6 (5.2%)

Source: Author's data.

In relation to the first statement, VRIN1, the respondents absolutely agreed that in relation to the supplier under consideration, given the resources that it had and had access to, it was able to take advantage of business opportunities and/or neutralise business threats. This is reflected in a mean score of 3.62 out of 5 and a standard deviation of 0.920 (which gives an indication of how far the scores deviate from the mean). 51.7% agreed and 12.9% strongly agreed. In addition, 12.1% of the respondents disagreed and 1.7% strongly disagreed, while the remaining 12.6% indicated that they neither agreed nor disagreed; that is, they were neutral towards the statement.

The respondents generally agreed with the second statement, VRIN2, that the supplier under consideration had a strategy that other suppliers with comparable resources did not

employ at the same time. The mean in this case was 3.27 out of 5, with a standard deviation of 0.972. The comparatively higher mean was a result of the following distribution of frequencies: 44.0% of the respondents agreed with the statement, while 6.0% strongly agreed. On the other hand, 25.9% of the respondents disagreed and 1.7% of them strongly disagreed, while the remaining 22.4% indicated that they neither agreed nor disagreed. Therefore, the majority ultimately agreed with statement ASPT2.

In relation to VRIN3, the respondents largely agreed that they were unable to easily learn the core technology or the way the supplier's service was produced in normal operations, which is reflected in the figures as a mean score of 3.59 out of 5. The standard deviation of 0.987 reflects the value of the following distribution of response frequencies. 47.4% of the respondents agreed that it was difficult to learn how to create the products or services during normal operations, and 15.5% agreed strongly. Furthermore, 1.7% of the respondents strongly disagreed and 15.5% disagreed with the statement, while the remaining 19.8% neither agreed nor disagreed. This shows that the absolute majority of the respondents agreed with statement VRIN3.

As with the previous statements, the supply chain managers generally agreed with statement VRIN4 ("We cannot learn the supplier's core technology or the way the service is delivered simply by observing its production/creation process"). With an average score of 3.25 out of 5 and a standard deviation of 0.978, 4.3% strongly agreed that it was not easy to learn the service or product creation by observing the related process of the supplier under consideration. 47.0% agreed with the statement, while 3.5% strongly agreed. While 21.7% were undecided, 23.5% disagreed. This indicates that the absolute majority of the respondents agreed that they were unable learn the way the service or product was produced simply by observing the production/creation process of the supplier.

With regard to the fifth statement, VRIN5, namely that it would take a long time for them to learn the supplier's core technology or the way the service was produced, the

respondents generally agreed. With a mean of 3.60 out of 5 and a high SD of 0.976, many respondents were undecided, at 20.9%. More than half of the respondents either agreed (45.2%) or strongly agreed (16.5%), while 0.9% strongly disagreed and 16.5% disagreed. Therefore, the absolute majority of respondents either agreed or strongly agreed.

Regarding statement VRIN6 ("It is not easy to copy or imitate the supplier's core technology or the way the service is produced"), the respondents generally agreed that it was not easy to copy or imitate the supplier's core technology or the way the service is produced. The mean is higher than three (3.58 out of 5) and the standard deviation is 0.910. 53.9% of the respondents agreed, while 10.4% strongly agreed. At the same time, 10.4% disagreed and 2.6% strongly disagreed, while the remaining 22.6% indicated that they neither agreed nor disagreed. Statement VRIN6 thus shows an absolute majority in favour of consent.

The respondents agreed with a high absolute majority with statement VRIN7, namely that they could not easily replace the core technology of their supplier under consideration or the way the service was produced in normal operations. The mean in this case is well above 3, at 3.83 out of 5, with a standard deviation of 0.755. The distribution of frequencies was as follows: over three quarters of respondents, namely 75.4% agreed and 9.6% strongly agreed with the statement; 5.3% disagreed and 1.8% strongly disagreed; while the remaining 7.9% indicated that they neither agreed nor disagreed. A very clear majority therefore agreed with statement VRIN7.

With regard to VRIN8, the respondents largely agreed that they could not simply substitute their supplier's core technology or the way their service was produced by observing their production/creation process, which is reflected in the mean of 3.38 out of 5. The SD of 0.820 reflects the value of the following distribution of response frequencies: 48.3% of the respondents agreed that the process of creation was not easily replaceable when observed, and 3.4% strongly agreed. Furthermore, 0.9% of the respondents strongly disagreed and 15.5%

disagreed with this statement, while the remaining 31.9% neither agreed nor disagreed. This shows that majority agreed with statement VRIN 8.

As with the previous statements, the respondents also generally agreed with statement VRIN9, that it would take a long time to substitute the core technology of the supplier under consideration or the way the service was produced. With an average score of 3.72 out of 5 and an SD of 0.929, 18.1% strongly agreed that substitution would take a long time, 50.9% agreed, while none strongly disagreed. 16.4% were undecided, and 14.7% disagreed that substitution would take a long time. Therefore, an absolute majority believed that it would take a long time to replace the core technology of the supplier under consideration or the way the service was produced.

Regarding VRIN10, that it was not easy to substitute the supplier's core technology or the way the service was produced, the respondents generally supported the statement. With a mean of 3.64 out of 5 and a high SD of 0.918, more than one-fifth were undecided, accounting for 21.1%. More than half of the respondents either agreed (52.6%) or strongly agreed (14.0%), while only 1.8% strongly disagreed and 10.5% disagreed. Therefore, the majority of respondents agreed with statement VRIN10.

In relation to statement VRIN11 ("The technical know-how of the supplier is above the industry average"), absolute majority agreed, with a mean of 3.76 out of 5 and a standard deviation of 0.776. More than half of the respondents supported the statement, as reflected by the fact that 50.0% agreed and 15.5% strongly agreed. In addition, 5.2% disagreed and none strongly disagreed, while the remaining 29.3% indicated that they neither agreed nor disagreed and were thus included in the analysis as neutral.

The majority of respondents also agreed with VRIN12, that the supplier's reputation is above the industry average. The mean in this case is 3.44 out of 5, with a standard deviation of 0.858. The distribution of frequencies was 41.4% who agreed with the statement, while 8.6%

strongly agreed. 12.9% disagreed and 0.9% strongly disagreed. The remaining 36.2% neither agreed nor disagreed. Therefore, the majority agreed with statement VRIN12.

Regarding the final statement (VRIN13), that the supplier's collaboration experience is above the industry average, the respondents tended to agree, with over one third undecided. With a mean of 3.17 out of 5 and a high SD of 0.968, 34.8% were undecided. Less than half either agreed (35.7%) or strongly agreed (5.2%) with the statement, while 5.2% strongly disagreed and 19.1% disagreed. Therefore, the majority of respondents either agreed or were undecided.

5.4.6 VRIN Criteria SB

The independent variable, namely the VRIN criteria (valuable, rare, inimitable, non-substitutable) of the supplier base (VRINSB), was measured using four items, with the mean of the four measures ranging from 3.17 (VRINSB3) to 3.22 (VRINSB1). The overall mean was 3.23 out of 5, and the standard deviation of the construct was 0.596 (see Table 9).

Table 21: Responses and descriptive statistics for VRIN criteria of the supplier’s supplier base

Statement	Mean	Standard Deviation	Response Scale				
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
VRINSB1	3.22	0.873	1 (0.9%)	24 (20.7%)	47 (40.5%)	37 (31.9%)	7 (6.0%)
VRINSB2	3.31	0.708	1 (0.9%)	10 (8.8%)	60 (51.3%)	42 (36.3%)	3 (2.7%)
VRINSB3	3.17	0.639	0 (0.0%)	14 (12.2%)	69 (59.1%)	32 (27.8%)	1 (0.9%)

Source: Author’s data.

In relation to VRINSB1, which measures the VRIN criteria of the supplier base, the respondents concurred that the supplier base of the supplier under consideration had a level of expertise that was above the industry average, with a mean of 3.22 out of 5 and a standard



deviation of 0.873. This shows that the majority agreed with the statement or neither agreed nor disagreed. 31.9% agreed and 6.0% strongly agreed, while 0.9% strongly disagreed, 40.5% were undecided and the remaining 20.7% disagreed. This shows that the majority of the respondents had a tendency to agree with statement VRINSB1.

The second statement, VRINSB2, which states that the reputation of the supplier's supplier base is above the industry average, showed a mean of 3.31 out of 5 and a standard deviation of 0.708. This is represented in the percentage distribution, with 36.3% agreeing, while 51.3% were undecided; that is, they neither agreed nor disagreed. 8.8% disagreed, 0.9% strongly agreed and the remaining 2.7% strongly disagreed. Therefore, there was a tendency for respondents to agree with the statement.

The third statement, VRINSB3, also had a mean greater than three, at 3.17 out of 5, with a standard deviation of 0.639. Therefore, the respondents tend to agree that the supplier's supplier base had experience of cooperative alliances that was above the industry average. This translates to 27.8% agreeing and 0.9% strongly agreeing with the statement, while 12.2% disagreed, no respondents strongly disagreed, and 59.1% were unclear, giving a neutral response.

#### 5.4.7 Vertical Integration

Finally, the dependent variable, vertical integration (VI), was measured using three items, with the mean of these three measures ranging from 3.18 (VI3) to 3.53 (VRI1). The overall mean was 3.40 out of 5, and the standard deviation of the construct was 0.765 (see Table 9).

Table 22: Responses and descriptive statistics for vertical integration

Statement	Mean	Standard Deviation	Response Scale				
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>VI1</b>	3.53	0.999	1 (0.9%)	21 (18.1%)	28 (24.1%)	47 (40.5%)	19 (16.4%)
<b>VI2</b>	3.47	0.973	3 (2.6%)	20 (17.2%)	23 (19.8%)	59 (50.9%)	11 (9.5%)
<b>VI3</b>	3.18	0.979	5 (4.3%)	26 (22.6%)	32 (27.8%)	47 (40.5%)	5 (4.3%)

Source: Author’s data.

Regarding VI1, the respondents generally agreed that they were considering taking the responsibility of creating the products or services of the supplier under consideration internally through the implementation of a merger or acquisition, with a mean of 3.53 out of 5 and a standard deviation of 0.999. 40.5% agreed and 16.4% strongly agreed, while 18.1% disagreed, 0.9% strongly disagreed and the remaining 24.1% were unclear. This shows that the absolute majority of the respondents agreed that they were considering vertical integration through M&A with the supplier.

In relation to the second statement, VI2, the respondents generally agreed that if the long-term need for the products or services from the supplier under consideration was foreseeable, they would be created within their own organisation through a merger or acquisition. The mean score was 3.47 out of 5 and the standard deviation 0.973; 50.9% agreed, 9.5% strongly agreed, 17.2% disagreed, 2.6% strongly disagreed and 19.8% were not clear about the statement. This indicates that the absolute majority of respondents agreed that if demand persisted, they would create the products or services internally through M&A as a form of vertical integration.

For the third statement, VI3, which measures vertical integration through M&A, the respondents agreed that it was very likely that their company would undertake the activity internally in the future through a merger or acquisition, with a mean score of 3.18 out of 5 and

a standard deviation of 0.979. This shows that they mostly agreed that there was a very high probability of conducting an M&A, as 40.5% agreed with the statement and 4.3% strongly agreed, while 4.3% strongly disagreed, 27.8% were undecided and the remaining 22.6% disagreed.

## 5.5 Model Testing and Research Hypotheses

The following section describes which methods and procedures were employed in the study, and how they were applied to determine the effect of the independent variables, asset specificity, environmental uncertainty, transaction frequency, closeness to competences, VRIN criteria and VRIN criteria of the supplier base, on vertical integration (the dependent variable). Various statistical techniques were used to perform relevant tests.

In the following sections, the research results are empirically examined, and their findings are presented and discussed. In this context, hierarchical multiple regression analysis was used, which is considered the most appropriate method for testing the relationships between the dependent and independent variables, also taking into account the control variables of firm age and firm size. These analyses were conducted using SPSS.

### 5.5.1 Model Summary

As explained earlier in the thesis, this work deals with the question of which determinants might be beneficial for vertical integration through M&A from a supply chain perspective and how they correlate to backward integration through M&A, while also assessing whether the transaction cost- or (E)RBV-related determinants are positively or negatively related to the implementation of such integration. In order to transfer this into practice and to answer these questions, a statistical model was used to predict the effect of the independent variables on vertical integration.

Hierarchical multiple regression analysis is suitable for investigating this effect, namely the relationship between several independent variables on one dependent variable (Tabachnick & Fidell, 2013; Field, 2013) and is considered indispensable for forecasting models (Hair et al., 2014). Furthermore, hierarchical multiple regression analysis is a very well suited, and a recognized statistical method, to statistically control for certain variables (in this study, firm age and size) and also to investigate whether adding variables significantly improves a model's prediction ability (Jeong & Jung, 2016). The independent variables (referred to as predictors in the context of the analysis) and the dependent variable, also referred to as the outcome, were entered into the SPSS regression model. An alternative would have been structural equation modeling (SEM). However, this was not employed as it is best suited to latent variables to determine their relationship in an integrated approach and to establish the analysable relationships between latent variables and the outcome (MacKinnon & Fairchild, 2009).

SEM is therefore particularly appropriate when mediating variables are used (Baron & Kenny, 1986). The causal relationships in a hypothetical mediation process, the simultaneity of indirect and direct effects, and the dual role of the mediator as the cause of the outcome and effect of the intervention, can be better represented with structural equations than with regression analysis (MacKinnon & Fairchild, 2009).

SEM can be used when a mediation process is extended to multiple independent variables, mediators, or outcomes, which is in contrast to standard regression, which requires the use of ad hoc methods for inferences about indirect and general effects (Clogg, Petkova, & Shihadeh, 1992). Moreover, unlike standard regression approaches, SEM allows for ease of extension to longitudinal data within a single framework (Gunzler, Chen, Wu, & Zhang, 2013).

This study is not of a longitudinal, but a cross-sectional nature and there are no mediating variables, as only direct relationships are measured, and therefore hierarchical multiple regression analysis is an appropriate method even in the context of control variables (Jeong & Jung, 2016).

Hierarchical multiple regression is also called sequential regression, and is based on the fact that the independent variables are introduced into the equation in a specific order. Such analysis is a strategy for applying multiple regression in which the predictors (independent variables) are not introduced simultaneously, but in stages, either individually or in blocks, in a predetermined order (Tabachnick & Fidell, 2014). In this case, hierarchical multiple regression allows for the specific testing of different research hypotheses on the nature of the relationships between the independent variables and the dependent variable. At each level, the additional variance part ( $R^2$ -change) explained by the newly introduced predictors in the dependent variable is determined.

To predict vertical integration through M&A by its determinants (independent variables), first the control variables were entered into block 1 and the determinants of vertical integration into block 2. Following the entry of all the variables, the model was evaluated in terms of its ability to predict the outcome variable, as well as the relative contribution of each block of variables.

Table 23: Model fit summary

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	$\Delta R^2$	$\Delta F$	Df1	Df2	Sig. $\Delta F$	Durbin-Watson
1	.070 <sup>a</sup>	0.005	-0.013	0.005	0.275	2	113	0.760	2.158
2	.578 <sup>b</sup>	0.334	0.284	0.329	8.816	6	107	0.000***	

Source: Author's data.

a. Predictors: (Constant), Log Firm Size, Log Firm Age

b. Predictors: (Constant), Log Firm Size, Log Firm Age, Transaction Frequency, VRIN Criteria SB, Environmental Uncertainty, Asset Specificity, Closeness to Competences, VRIN Criteria

c. Dependent variable: Vertical Integration

With respect to model 2, the R-value reflects the correlation strength between the dependent and independent variables, while  $R^2$  is highly significant in that it reflects the fit of the model to the data and the impact of the predictors on the outcome variable (Field, 2013). The value of  $R^2$  ( $R^2 = 0.334$ ,  $p < .001$ ) thus suggests that 33.4% of the explanatory power of

backward integration through M&A is accounted for by the determinants of vertical integration. This means that the determinants of vertical integration explain 33.4% of the variations in the backward integration through M&A.

However, this also means that other factors have an influence, but are not part of this study due to the focus on RBV and TCT and the constructs derived from them. Other possible factors, as discussed in Section 2.2.2, can be summarised as follows: operational synergies, for example, production or administrative efficiencies (Gupta & Gerchak, 2002); financial synergies, for instance, tax benefits, additional growth opportunities, or co-insurance of debt (Gaughan 2010); long- and short-term economies of scale (Christensen et al., 2011; Hassan & Mayrhofer, 2018); bargaining power, as order quantities can increase (Carney, 2009; Huang, Huang, & Chen, 2013); expanding market share or maintaining leading market share (Carney, 2009); entering new markets (Seth, Song, & Pettit, 2000; Sudarsanam, 2003; Weber, 2019); vertical constraints that may contribute to firms' operating costs (Chemla, 2003); and CEO compensation (Bliss & Rosen, 2001; DeYoung, Evanoff, & Molyneux, 2009). The value of the adjusted  $R^2$  is 0.284 in the previous model and serves to explain the extent to which the model is generalisable, as well as reflecting the fit of the overall model (Field, 2013; Sarstedt & Mooi, 2014). In particular, the difference between  $R^2$  and adjusted  $R^2$  plays a decisive role (here:  $0.334 - 0.284 = 0.05$ ), which in this study is low at 0.05 and thus explains that if the researcher had derived the model from the population instead of the sample, it would not have caused a significant change in the outcome variable and the predictable change in the outcome would only be around 5.0 % (Field, 2013).

Another indicator to test the fit of the model is the F-ratio in conjunction with the p-value (Field, 2013). If the model is significant, then further testing is not necessary (Sarstedt & Mooi, 2014) as these tests provide evidence of improvement in the prediction of the outcome (Field, 2013). In this study, the F-ratio value is highly significant ( $\Delta F = 8.816$  &  $p < .001$ ), meaning that the model is able to explain the variance in the dependent variable.

The results of the Durbin-Watson test were obtained in SPSS to examine the serial correlation between errors and whether residuals were correlated or not. The value of this test was 2.158, which, according to Field (2013), indicates that there are no issues with correlations between residuals when testing the model, as the value is in the acceptable range. According to Field (2013), these values fall between 0 and 4, while ones smaller than 1 or larger than 3 are considered problematic, with ones closer to 2 preferred, as is the case in this study.

When controlling for firm age and size, changes in significance in  $R^2$  regarding what is explained by the controls provide initial support for the hypotheses. That is, some of the determinants of vertical integration introduced in the second step (Model 2) show significant relationships with the outcome variable ( $\Delta R^2 = 0.334$ ,  $F$  for  $\Delta R^2 = 8.816$ ,  $p < .001$ ). It is of particular interest that two of the determinants are significantly related to vertical integration, namely asset specificity and closeness of competences.

Therefore, it can be stated that the values shown above emphasise that the model meets the requirements of overall fit with the data. It can also be assumed that the determinants of vertical integration have a positive influence on the implementation of backward integration through M&A. The next step is to determine the contribution of each independent variable to the variation in the dependent variable and to test and discuss the study hypotheses.

### 5.5.2 Research Hypothesis Testing

To test the research hypotheses, the hierarchical multiple regression method was used by statistically analysing the effect of the independent variables on the dependent variable. In this context, as shown in the correlation matrix of variables in an earlier chapter, all the research constructs were significantly correlated.

### 5.5.3 Results of Testing the Effect of the Determinants of Vertical Integration on Backward Integration through M&A

In the following analysis (see Table 24), the standardised beta coefficient, the t-value and the significance of the individual predictors were used to determine the most significant predictor of the model. The standardised beta coefficient ( $\beta$ ) represents the magnitude of change in the outcome variable for each 1-unit change in the predictor variable; in other words,  $\beta$  refers to how many standard deviations an outcome variable alters for each standard deviation increment in the predictor variable (Field, 2013).

The t-value allows the determination of the effect of each independent variable on the outcome variable (Sarstedt & Mooi, 2014). It measures the size of the difference relative to the dispersion in the sample data. In other words, t is simply the calculated difference, represented in units of standard error. The larger the magnitude of t, the greater the evidence against the null hypothesis (which states that there is no difference or relationship between two sets of data tested). This means that there is stronger evidence of a significant difference. The closer the t-value is to zero, the more likely it is that there is no significant difference.

Table 24: Hierarchical multi-regression analysis results

Variable	Step 1		Step 2		
	Standardised Coefficients	t-value	Standardised Coefficients	t-value	Sig.
	$\beta$		$\beta$		
<b>Control Variables</b>					
Log Firm Age	0.015	0.137	0.088	0.911	0.364
Log Firm Size	0.060	0.537	0.005	0.046	0.964
<b>Independent Variables</b>					
Asset Specificity			0.255	2.938	0.004**
Environmental Uncertainty			0.128	1.388	0.168
Transaction Frequency			-0.011	-0.134	0.894
VRIN Criteria			0.105	1.056	0.293
VRIN Criteria SB			0.153	1.684	0.095
Closeness of Competences			0.273	3.069	0.003**

Source: Author's data.

Dependent variable: Vertical Integration

Source: Author's data. \*p < .05, \*\*p < .01, \*\*\*p < .001.



In terms of the this study, the results in Table 24 indicate that out of the six determinants of vertical integration, only the asset specificity and closeness of competences variables were statistically significant, at  $p < .001$  or  $p < .01$  respectively. In contrast, the effect of the remaining variables, environmental uncertainty, transaction frequency, VRIN criteria and VRIN criteria SB, were not significant at any level ( $p$ ). The details of the data in the Table 24 that were used to test the research hypotheses are presented below.

**Hypothesis 1 (H1):** The higher the degree of asset specificity within the relationship between buyer and supplier, the greater the likelihood of using backward integration through M&A.

The results of the multi-regression analysis support this hypothesis, as  $t = 2.938$  and  $p < 0.01$ . Empirically, this implies that a high degree of asset specificity within buyer-supplier transactions has a positive and significant effect on the likelihood of using backward integration through M&A.

**Hypothesis 2 (H2):** The greater the environmental uncertainty, the greater the likelihood of using vertical integration through M&A along the supply chain.

The results of the multiple regression analysis negate hypothesis H2, as there is a non-significant positive relationship between environmental uncertainty and virtual integration through M&A, represented by  $p = 0.168$  and a  $t$ -value of 1.388.

**Hypothesis 3 (H3):** The higher the frequency of transactions between a firm and its supplier, the higher the likelihood of backward integration through M&A along the supply chain.

The results of the multiple regression analysis showed that  $t$  equals  $-0.134$ . The non-significant result ( $p = 0.894$ ), as with the previous hypothesis, means that the third hypothesis is not supported.

**Hypothesis 4 (H4):** The higher the degree of closeness between the buyer's present competences and the competences required for a specific activity performed by a supplier, the higher the likelihood of backward integration through M&A.

The results support this hypothesis, with a  $t$ -value of  $3.069$  and a  $p$   $0.003$ , so there is an empirically proven significant positive effect of the degree of closeness between the buyer's competences and those required for a specific activity performed by a supplier on the likelihood of backward integration through M&A.

**Hypothesis 5 (H5):** The closer the resources acquired from a supplier are to the VRIN criteria, the higher the likelihood of vertically integrating the supplier through M&A.

The results of the multiple regression analysis negate hypothesis H5, as there is a non-significant ( $p = 0.293$ ) positive relationship (with a  $t$ -value of  $1.056$ ) between the proximity of the resources acquired from a supplier to the VRIN criteria and the likelihood of vertically integrating the supplier through M&A.

**Hypothesis 6 (H6):** The more a supplier's supplier base possesses VRIN resources, the more likely it is that the buyer will merge with or acquire the supplier.

As in hypothesis H5 above, there is a non-significant positive effect of the VRIN resources of the supplier base on the likelihood of vertical integration through M&A, so

hypothesis 6 is not supported, as reflected by a t-value of 1.684 and  $p = 0.095$  in the multiple regression analysis results.

## 5.6 Summary

In this chapter, various statistical analyses have been presented, discussed and applied to the study, with the ultimate aim of investigating the research objectives. Analyses of missing data, outliers, normality and linearity were used to prepare the data for further analysis and to test their suitability for the study. Missing data were replaced by the mean method and six data sets were excluded (due to more than 5% missing data). Outliers were also identified, but these were not considered critical for the further use of the data. The data could also be considered to be normally distributed. Furthermore, it emerged that there were no problems with multicollinearity or singularity.

The reliability of the research constructs has been demonstrated. The chapter also discussed the examination of the validity of the research questionnaire, whereby the content and construct validity, together with the results of the exploratory factor analysis, were considered and analysed. The results of these analyses confirmed that the research questionnaire was valid.

Furthermore, the results of the descriptive statistics for the constructs of asset specificity, environmental uncertainty, transaction frequency, closeness of competences, VRIN Criteria and VRIN criteria of the supplier base were shown. The means, standard deviations and frequencies were presented in this context.

Analysis was then conducted to predict the effect of the independent variables identified in the study on vertical integration. For this purpose, it was first examined whether the proposed model was suitable and appropriate for the investigations. Based on tests using multiple

regression analysis and analysis of variance, it was found that the proposed met the requirements for overall fit with the data.

Based on this result, it was possible to conduct further tests regarding the investigation of the formulated hypotheses, which supported hypotheses H1 and H4, showing that the high degree of asset specificity within transactions between buyer and supplier had a positive influence on backward integration through M&A, which was also true for the degree of closeness between the buyer's existing competences and those required for a specific activity of a supplier. In contrast, there was no positive effect of environmental uncertainty, frequency of transactions or VRIN criteria on backward integration through MA.

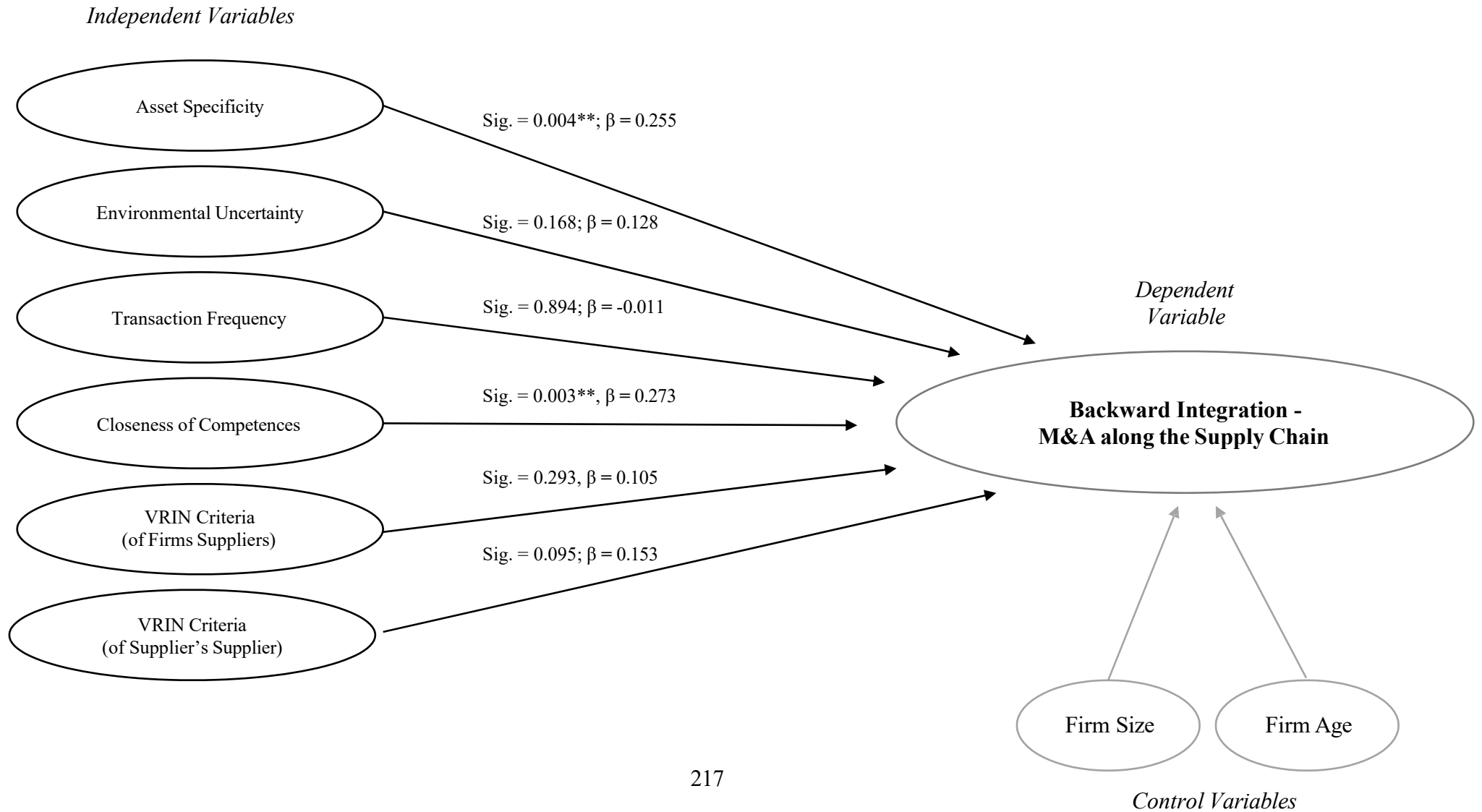
Table 25 shows the correlations and results related to the research objectives, analysis method and hypothesis testing results, while Figure 17 shows in diagrammatic form the significance of the hypothesised relationships and the corresponding  $\beta$ -values.

Table 25: Results of the research objectives, model testing and research hypotheses

Objective	Model Testing & Research Hypotheses	Analytical Model	Result
To statistically assess the proposed conceptual research model.	The full proposed conceptual framework fits the data gathered for the research.	Hierarchical Multiple Regression Analysis & Analysis of Variance (ANOVA)	Supported
To examine the relationship between the potential determinants of vertical integration and backward integration through M&A.	H1: The higher the degree of asset specificity within the relationship between buyer and supplier, the greater the likelihood of using backward integration through M&A.	Hierarchical Multiple Regression Analysis	Supported
	H2: The greater the environmental uncertainty, the greater the likelihood of using vertical integration through M&A along the supply chain.	Hierarchical Multiple Regression Analysis	Not supported
	H3: The higher the frequency of transactions between a firm and its supplier, the higher the likelihood of backward integration through M&A along the supply chain.	Hierarchical Multiple Regression Analysis	Not supported
	H4: The higher the degree of closeness between the buyer's present competences and the competences required for a specific activity performed by a supplier, the higher the likelihood of backward integration through M&A.	Hierarchical Multiple Regression Analysis	Supported
	H5: The closer the resources acquired from a supplier are to the VRIN criteria, the higher the likelihood of vertically integrating the supplier through M&A.	Hierarchical Multiple Regression Analysis	Not supported
	H6: The more a supplier's supplier base possesses VRIN resources, the more likely it is that the buyer will merge with or acquire the supplier.	Hierarchical Multiple Regression Analysis	Not supported

Source: Author

Figure 17: The final model



## 6 Discussion of the Research Findings

In Chapter 5, the research data were subjected to statistical analysis and the results were presented and discussed. The main purpose of this chapter is to discuss and present the results in the context of the underlying theories, as well as in the context of the findings of other researchers. The discussion is conducted with reference to the six research hypotheses, which were developed in Chapter 3.

### 6.1 H1 - The higher the degree of asset specificity within the relationship between buyer and supplier, the greater the likelihood of using backward integration through M&A.

H1 deals with the relationship between asset specificity and backward integration through M&A. As shown in chapter 5, the analysis revealed that such integration was particularly associated with the presence of asset specificity in the supplier-buyer relationship. The analysis shows that this asset specificity has a positive and significant influence on the likelihood of using backward integration through M&A, indicating that the presence of a high level of asset specificity in the relationship between supplier and buyer is an indicator of a greater likelihood of M&A as opposed to a situation with low asset specificity within the buyer-supplier relationship.

This result is in line with research approaches that have investigated the relationship between asset specificity and vertical integration (e.g., de Souza Filho & Miranda, 2019; Lieberman, 1991; Escuer et al., 2013; Monteverde & Teece, 1982). These studies do not address the relationship between backward integration and M&A, but rather asset specificity and vertical integration. They tend to focus on the integration of specific transactions rather than on the integration of companies, which is also a research gap. Other studies have examined high asset specificity in conjunction with uncertainty, among other issues, showing that the presence

of high asset specificity also leads to vertical integration being a beneficial governance mode (de Souza Filho & Miranda, 2019; Hobbs, 1996; Leiblein & Miller, 2003; Murcia & Tarzijan, 2018; Poppo & Zenger, 2002).

Other empirical studies support the results of this study, demonstrating that the relationship between asset specificity and vertical integration is positive (e.g., de Souza Filho & Miranda, 2019; Joskow, 1988; Mahoney, 1992; Rindfleisch & Heide, 1997; Shelanski & Klein, 1995; Yu et al, 2021), and conversely that outsourcing is more likely when asset specificity is low (Cox, 1996; Hobbs, 1996; Kogut, 1991; Parmigiani, 2007; Richardson, 1996; Walker & Weber, 1984; Yuan, Chu, Lai, & Wu, 2020). Between the two extremes of the market and firm, various hybrid modes of governance are possible, which are advantageous when frequent transactions take place at an intermediate level of asset specificity (Williamson, 1985, 1991).

The results of this study also support the findings of researchers who have studied and deciphered asset specificity as an indicator of vertical coordination within a supply chain. The higher the specificity of the assets, the more the type of coordination corresponds to vertical integration (de Souza Filho & Miranda, 2019, Hobbs, 1996), or eventually backward integration through M&A, which again has not been empirically proven, but was theoretically justified by Cox (1996) with TCT.

Nevertheless, the results related to hypothesis H1 support the "continuum of asset-specific external contract forms" proposed by Cox (1996), as in fact, following the logic of this continuum, this thesis argued that the likelihood of a firm merging with or acquiring another depends on the degree of asset specificity within the buyer-supplier relationship. This not previously empirically tested continuum also states that the closer the goods or services (or the way they are produced) are to the firm's capabilities and expertise, that is, its core competencies (referred to as high asset specificity), the more likely it is that firms will engage in mergers and acquisitions up the supply chain with their suppliers. The results related to H1 also contribute



to the fact that, as asset specificity can also be understood as skills and expertise that form the core competencies of a firm (Cox, 1996; Prahalad & Hamel, 1990; Richardson, 1996), they are also referred to as critical firm-specific resources (Williamson, 1981; Zhao, Luo & Suh, 2004), which are necessary to maintain firms' position in the market and generate profits, and should therefore be kept within them.

As has been pointed out in this study, the degree of asset specificity within the buyer-supplier relationship has an impact on the likelihood of a company merging with or acquiring another. This is also true because the relationship between the parties changes as a result of the increase in the specificity of the input factors, since a switch to another transaction partner becomes increasingly difficult as either the quasi-rents, that is, the revenue difference compared to the next possible use of the factors, or the cost advantages resulting from specificity, are lost (Ebers & Gotsch, 1995). The results of testing this hypothesis support the explanation of Ebers and Gotsch (1995). Reflected by the asset specificity measures, difficulties in switching the supplying company are then, amongst others, traced back to specific skills that need to be built to manage the buyer-supplier relationship, the time invested in learning aspects of the supplier's operation, or acquisition of knowledge regarding the supplier's technical or service standards.

In summary, the result showing a positive and significant correlation is therefore consistent with many previous approaches and empirical results, even though previous studies have not explicitly investigated the backward integration of suppliers through mergers or acquisitions. This gap has therefore been addressed in this study.

## 6.2 H2 - The greater the environmental uncertainty, the greater the likelihood of using vertical integration through M&A along the supply chain.

The second hypothesis deals with the relationship between environmental uncertainty and vertical integration through M&A. The results in Chapter 5 showed that environmental uncertainty is not particularly associated with backward integration through M&A. The analysis

demonstrated that environmental uncertainty has an insignificant impact on the execution of M&A by suppliers.

However, although the relationship is positive, it is not significant, which means that there is no dependency relationship between these two variables. This result contradicts those of previous studies, which all found a positive impact of uncertainty on vertical integration (e.g., Escuer et al., 2013; John & Weitz, 1988; Levy, 1985; Masten, 1984; Shukor, Newaz, Rahman, & Taha, 2020; Yu et al., 2021).

Nevertheless, the results of previous research are essentially ambivalent. Findings which show a positive relationship between environmental uncertainty and vertical integration (e.g., Levy, 1985; Masten, 1984; John & Weitz, 1988; Shukor et al., 2020; Yu et al., 2021) or supporting hypotheses on the assumption that asset specificity and uncertainty are key constructs when it comes to vertical integration or boundary decisions (e.g., de Souza Filho & Miranda, 2019; Lieberman, 1991; Escuer et al., 2013; Monteverde & Teece, 1982; Yu et al., 2021) contrast with other empirical work inspired by transaction cost analysis that has raised concerns about the hypothesis that high uncertainty is associated with a governance mode that moves towards vertical integration (Krickx, 2000).

Although transaction cost analysis suggests a positive relationship between uncertainty and vertical integration (Fan et al., 2017; Krickx, 2000), some scholars have also found a negative relationship in terms of preferred governance modes in the presence of environmental uncertainty. For example, Gatignon and Anderson (1988) concluded that environmental uncertainty is negatively related to the percentage of ownership. Balakrishnan and Wernerfelt (1986) found that uncertainty had a negative impact on vertical integration, while Walker and Webber (1984) found a negative relationship between vertical integration and uncertainty related to technology. This is also supported, for example, by Harrigan (1985) and Jauch, Osborn and Glueck (1980), who argue that companies operating in industries with rapidly changing technological markets, and associated environmental uncertainty, should not pursue

integration as a governance mode in order to maintain flexibility. Yang and Zhao (2016) took and examined a more differentiated view of uncertainty, finding that vertical integration decreased with supply volatility and technology uncertainty but increased with demand volatility and legal unenforceability. Other research, including this study, has found no significant relationship between the two constructs (Anderson & Schmittlein, 1984; Maltz, 1994).

Contrary to the prevailing view that the higher the frequency (and hence monitoring costs) of a firm's governance form, the more beneficial it is, as transaction frequency and hence transaction costs can be reduced (Williamson, 2008), Hobbs (1996) argues the opposite. In the presence of uncertainty, a company tends to choose a governance mode in which it can conduct transactions within its own corporate boundaries in order to have control over the unpredictable benefits and costs. From a supply chain perspective, this means that in the presence of low uncertainty, a firm will operate in the spot market and conversely, in the presence of high uncertainty, it will choose a governance mode in which it has more control, such as vertical integration (Hobbs, 1996). Therefore, transactions with high uncertainty would be internalised because they would otherwise appear as part of an external contract and the company would be less flexible to respond to these uncertainties; against this background, TCT predicts that such activities will be undertaken within the boundaries of a company (Amaral et al., 2006; Williamson, 1985). Other authors have also followed this approach and found that the higher the uncertainty, the more likely the governance mode of the firm, so vertical integration may emerge as an advantageous governance mode in transactions with increasing uncertainty (De Vita, Tekaya, & Wang, 2010; Hobbs, 1996; Leiblein & Miller, 2003; Poppo & Zenger, 2002). This prediction, as explained above, has not only not been verified in this thesis, but other researchers have also concluded that this relationship is not significant. It can be concluded that the impact of environmental governance decisions on vertical integration is ambiguous. This is consistent with the results of this research, which has not found significant empirical

dependence of the variables; that is, between environmental uncertainty and backward integration through M&A. It is precisely because of this ambiguity and the nonsignificant result of the current study that further research in this area is needed.

Although the result is not statistically significant, which is in line with the research findings of Anderson and Schmittlein (1984), it represents an important contribution to research, as both the literature underlying the construct of environmental uncertainty, which ultimately led to the hypothesis, and the measures of the construct, can be applied in future research (Mathur & Van der Weele, 2020; Mlinarić, Horvat, & Šupak Smolčić, 2017).

Furthermore, the reasons why a result is not significant can be based on various factors. One of these is the lack of validity and reliability (Mohajan, 2017). However, as shown in Chapter 5.3, the results of the construct validity, content validity and construct reliability tests were all within an acceptable range for the construct of environmental uncertainty.

In principle, a sample size that is too small can also favour non-significant results (Visentin, Cleary, & Hunt, 2020). However, as shown in Chapter 4.7, Section 4.7.4, this was determined on the basis of scientifically accepted framework conditions to counteract this risk.

What cannot always be completely excluded is that the characteristics of the defined population influence the significance of the statistical results. This study attempts to represent the population as well as possible, but it cannot be ruled out that overrepresentation or underrepresentation may occur in the random selection process, accompanied by the risk of the population being too homogeneous (Etikan, Musa & Alkassim, 2016). Therefore, it would be an opportunity for future research to test this hypothesis in the context of other populations.

Another factor that cannot be ruled out is that not all the external factors that could explain the results could be controlled for (Frank, 2000). The control variables used here, firm age and firm size, are based on the experience of other studies (e.g., Gulbrandsen et al., 2009; Hui et al., 2013; Lazzarini, Miller, & Zenger, 2008; Poppo & Zenger, 1998). Random errors due to variables that could not be controlled for in the study could cloud the results, and the

sample size might then not be large enough to achieve the precision needed to detect the effect (Frank, 2000; Visentin, Cleary, & Hunt, 2020). Nonetheless, both the control variables and the sample size were determined and justified based on existing research. The inclusion of further control variables to reduce the likelihood of false and suppressed effects in theory testing might be beneficial for future research.

Another explanation could be that other strong factors have masked the effect of the environmental uncertainty variable (Frank, 2000). The fact that other factors also influence backward integration is also indicated by the statistical value of the model summary  $R^2 = 0.334$ , which in essence means that 33.4% of the explanatory power of backward integration through mergers and acquisitions can be attributed to the determinants of vertical integration. As already stated in Chapter 5.1.1, according to the literature review, the following factors can also influence whether M&A are undertaken or not: operational synergies (Gupta & Gerchak, 2002); financial synergies (Gaughan 2010); economies of scale (Christensen et al. 2011; Hassan & Mayrhofer, 2018); bargaining power (Carney, 2009; Huang, Huang, & Chen, 2013); market expansion (Carney, 2009); new market entry opportunities (Seth, Song, & Pettit, 2000; Sudarsanam, 2003; Weber, 2019); vertical constraints (Chemla, 2003); or CEO compensation (Bliss & Rosen, 2001; DeYoung, Evanoff, & Molyneux, 2009). These were not included because only constructs and variables from the RBV and TCT strands, which form the theoretical basis of the study, were included. In future research, the inclusion of additional variables is a possibility to counteract the masking effect.

Future research could also examine a different set of variables or include additional ones. This study, and therefore the set of variables, focuses on the theoretical background of RBV and TCT. Nevertheless, in order to counter this risk in future research, the expansion of variables could follow a more differentiated approach, similar to that of Yang and Zhao (2016), and may be better suited to examining the effects of different variants of uncertainty on backward integration.

6.3 H3 - The higher the frequency of transactions between a firm and its supplier, the higher the likelihood of backward integration through M&A along the supply chain.

The third hypothesis concerns the frequency of transactions between a company and its suppliers; that is, the frequency relating to the purchase of products or services from the supplier or the frequency of orders placed with that supplier. The statistical results of the previous analysis in Chapter 5.5.3 show that the constructs of transaction frequency and vertical integration of suppliers through M&A are not particularly associated, as the analysis leads to the conclusion of a negative non-significant relationship or impact of transaction frequency on backward integration through M&A.

Following the propositions in the literature, one would assume that transaction frequency would have a positive impact on vertical integration (Ketokivi & Mahoney, 2017; Williamson, 2008). According to Williamson, a higher frequency of transactions is associated with higher monitoring costs, which could be reduced by the firm as a governance mode, and thus it is assumed that such a mode would be beneficial when transaction frequency is high.

This prevailing logic, developed earlier by Williamson (1979), goes hand in hand with the idea that the cost of an elaborate governance structure (such as vertically integrating a supplier through M&A) is not economic for one-off or occasional transactions, so that only an increase in frequency leads to the prediction of possible vertical integration. However, the results of this study are not consistent with this prediction, as the relationship is not only not significant, but also negative.

However, the literature also offers explanations for a negative relationship. The argument is that vertical integration (e.g., through mergers or acquisitions) is contrary to the maintenance of a desired ongoing relationship in economic interests, namely when the value of an anticipated future transaction outweighs the economic benefit of a one-off opportunistic action that ultimately carries the risk of terminating the exchange relationship (Klein & Leffler,

1981). Following this logic, transaction frequency reduces the probability of opportunism and thus reduces the need for vertical integration (Ketokivi & Mahoney, 2020). Against this background, the results of this study and the logic of its argumentation is comprehensible, at least as far as the negative correlation is concerned, since no significance has been proven.

In addition, considering the view of Hobbs (1996), the study results, namely that transaction frequency has no positive impact on vertical integration, correspond to his argumentation. According to the Hobbs (1996), repetitive transactions with a high transaction frequency can be highly desirable for the parties involved (in this study the respective company and its suppliers), and are not damaged by opportunistic behaviour, since each side also obtains valuable information about the other. Following this logic, a high transaction frequency can also lead to transactions being made on the spot market (Hobbs, 1996). Accordingly, less frequent transactions are more likely to lead to opportunistic behaviour and the exploitation of possible information asymmetries, so a low transaction frequency is more likely to predict a movement towards vertical integration as the beneficial governance mode (Hobbs, 1996).

This study contributes to the empirical research on the relationship between transaction frequency and vertical integration, as theoretical studies in this area predominate, with empirical research often focusing on asset specificity and uncertainty and their relationship with vertical integration, providing little evidence on the effect of transaction frequency as such (see de Souza Filho & Miranda, 2019; Rindfleisch 2020; Rindfleisch & Heide, 1997).

Although the influence of transaction frequency and backward integration has not been empirically investigated in the literature, there are empirical studies that provide some evidence of positive and significant relationships within the supply chain. Majumdar and Ramaswamy (1994), for example, found that in industries with goods characterised by frequent purchases, downstream distribution activities tend to be more integrated. This finding correlates in its internal logic with the hypothesis of the study, but only in relation to the other side of the supply chain (forward integration).

Jensen and Rothwell (1998) also investigated the relationship between the frequency of transactions and governance mode and concluded that frequently performed tasks tended to be undertaken by the internal workforce, while infrequently performed ones were more likely to be undertaken by external independent contractors, so that a positive relationship between the frequency of transactions and integration into the company was found. This is in contrast to the analysis of Anderson and Schmittlein (1984), for example, who found no significant correlation between transaction frequency and governance mode.

Hafeez and Andersen (2014) empirically investigated the impact of transaction frequency on outsourcing and found that such frequency was positively related to outsourcing, which contradicts other studies in this research field (Everaert, Sarens, & Rommel, 2010; Kamyabi & Devi, 2011), which suggest that frequency is statistically negatively related to outsourcing. The results of Hafeez and Andersen (2014) suggest that if frequency is positively related to outsourcing, it will not be positively related to vertical integration at the same time, which is again consistent with the negative relationship between transaction frequency and backward integration.

Empirically, the results of this study are in line with the earlier analysis of Anderson and Schmittlein (1984), who also found no significant relationship between transaction frequency and integration. Moving on to the reasons for the insignificance, as already discussed in relation to the results of hypothesis 2, the validity of the constructs has an impact on the result in terms of significance (Mohajan, 2017). The Cronbach's alpha value for the construct of transaction cost frequency was in the lower range of acceptability. Scales that have fewer measurement items can result in low reliability estimates (DeShon, 1998; Gerhart, Wright, & McMahan, 2000; Hair et al., 2014). However, the construct was adopted from other previously conducted studies that also only used two measurement items (Murray et al., 1995; Murray & Kotabe, 1999; Maltz, 1994), thus providing the rationale and support for this decision.



Low reliability estimates may be based on a sample size that is too small, as this may lead to greater variability in the measured values (Huselid & Becker, 1996). However, as described in section 6.2, the study relies on a derivation of the sample size based on a scientifically accepted order of magnitude. Furthermore, reliability could be based on a lack of consistency in supply chain practices, since the selected population is represented by different supply chain organizations, which in turn have different areas of responsibility (e.g., purchasing, internal logistics, external logistics, production planning), which could potentially reduce the reliability of the estimates (Gerhart et al., 2000). Future studies in this context could consider only equal areas of responsibility within the supply chain.

The fact that the quantitative data come from individual raters may also affect reliability (Gerhart, Wright, McMahan, & Snell, 2000; Huselid & Becker, 2000). Nevertheless, the coefficient alpha is sometimes considered insufficient for determining reliability because it does not account for all measurement errors that may occur; for example, due to the raters themselves (Gerhart et al., 2000; Huselid & Becker, 1996).

The other factors discussed in section 6.2, such as external factors that could have been used as control variables and other strong influencing factors that mask the effect of the frequency of transactions, might also have played a role in the insignificant results (Frank, 2000) related to hypothesis 3. The discussion underlines the fact that insignificant results nevertheless contain important content that can be used beneficially in future research. In particular, the variables and measures underlying the hypothesis could be used adaptively, which is also in line with the conceptual model of this study.

#### 6.4 H4 - The higher the degree of closeness between the buyer's present competences and those required for a specific activity performed by a supplier, the higher the likelihood of backward integration through M&A.

The analyses conducted in the previous chapter show that there is a pronounced and empirically proven significant positive effect of the degree of competency similarity between a buyer's existing competencies and a supplier's competencies required for a specific activity on the likelihood of backward integration through M&A.

This is in line with the findings of Wang and Zajac (2007), who conclude that firms with high resource similarity are more able to assess the potential target's capabilities and associated assets, thus mitigating the problem of information asymmetry that is already prevalent. The reason for this is that similar resources imply existing knowledge about the potential partner; therefore, Wang & Zajac (2007) come to the conclusion that the greater the similarity between two companies, the greater the probability that they will combine their resources through an acquisition, while a high complementarity of resources between two firms will lead them to choose alliances instead of acquisitions. The results of this study support this proposition, insofar as a high similarity of competences, as used interchangeably with resources (Barney, 1991; Das & Teng, 2000; Eisenhardt & Schoonhoven, 1996), has a positive impact on conducting M&A with suppliers.

The fact that similarity or closeness of competences has an impact on mergers and acquisitions is also consistent with the research of Argyres and Zenger (2012), who claim that firms control internally comparative capabilities and outsource the access to capabilities if the firm has less expertise. This is because similarity in resources ultimately means that the respective firm has expertise in these areas.

The findings of this study are also in line with the approach of Richardson (1972); before integrating a new activity, a company needs to assess the extent to which it can use similar and existing capabilities; that is, the degree of similarity is important, or as it is termed and verified in this study, the closeness to the existing competence, which according to Gulbrandsen et al.

(2009) can be described as "the degree of similarity between the company's current competence pool and the new competence required to perform the activities acquired from the supplier" (p. 91).

The findings of this study are also consistent with the idea that firms tend to expand their boundaries towards those areas where their current competences can be used to create new value and accordingly gain comparative advantage (Richardson, 1972; Winter, 1988). Indeed, according to Winter (1988), firms can grow through vertical integration by supplementing their resources and capabilities with something closely related to their existing knowledge, experience and skills. This very fact is reflected in the measures of the variable; that is, the knowledge that the company has is comparable to the knowledge that the supplier's employees possess in the context of providing products or services. Experience and skills are also reflected in the measures, because given the supplier's capabilities, the company's skills, routines and procedures are thus well suited to producing the supplier's products or services.

Gulbrandsen et al. (2009) also empirically investigated the relationship between the two constructs (closeness of competences and vertical integration), focusing on the integration of a particular service rather than the acquisition or merger of a firm (specifically suppliers), which constitutes a research gap and has been addressed in this study. Nevertheless, Gulbrandsen et al. (2009) also found that proximity to current competence is positively related to vertical integration. This general correlation, in turn, is supported by the results of this work.

#### 6.5 H5 - The closer the resources acquired from a supplier are to the VRIN criteria, the higher the likelihood of vertically integrating the supplier through M&A.

The fifth hypothesis focuses on the relationship between the resources acquired from the supplier and vertical integration depending on the level of the VRIN criteria of the resources. In the analysis in the previous chapter, it became evident that there was a positive relationship

between the constructs of the VRIN criteria of resources and vertical integration through M&A, but it also emerged that there was no significant impact.

The relationship between VRIN criteria and vertical integration in practice has not yet been empirically investigated in the literature. Propositions stem from the outsourcing perspective, in relation to which Espino-Rodríguez and Padrón-Robaina (2006) formulated the notion that the more valuable and heterogeneous the resources or capabilities of an activity are, the more likely they are not to be outsourced. In addition, the less interchangeable and imitable the resources are, the more likely they will be kept in the governance mode of the firm. Since M&A are designed to last, the creation of sustainable competitive advantage needs to be achieved (Lu & Feng, 2010). Penrose (1959) stated that, from the RBV perspective, the internalisation of resources through M&A in particular represents a variant for acquiring strategic resources. Based on these strands of logic, one could expect empirical support from this study, but this was not the case due to the non-significant results, even though the correlation was at least positive.

In addition, one motive for undertaking M&A is the acquisition of strategic assets (Deng, 2009), which in turn can be understood as resources that go hand in hand with the realisation of competitive advantages (Amit & Schoemaker, 1993; Hitt et al., 2016). This also corresponds to the argument put forward by Grant (1991), that the need to create or acquire resources occurs when a firm has a shortage of these, so it needs to understand which resources create competitive advantages. According to Barney (1991), these are the ones that meet the VRIN criteria. According to Barney, it is not enough for a firm to possess only valuable (V) and rare (R) resources that lead to competitive advantages, but these resources also need to exhibit inimitability (I) and non-substitutability (N); only then will sustainable competitive advantage be created. Resources that such competitive advantage are therefore those that meet the VRIN criteria (Barney, 1991).

Ultimately, these resources should benefit the customer (Hamel & Prahalad, 1994), which also applies to the supply chain, which can be defined as a virtual network of organisations that are involved in various processes and activities through upstream and downstream linkages that will ultimately generate value for the consumer of products and services (Christopher, 2016). A lack of such resources can be managed through internal creation or external acquisition (Hamel & Prahalad, 1994), with backward integration through M&A being one option from the RBV perspective (Penrose, 1959).

Also following this line of reasoning, one would assume that resources with high levels of VRIN criteria have an impact on vertical integration through mergers and acquisitions. However, as explained above, this is not the case, as the positive correlation is accompanied by a non-significant statistical result.

Nevertheless, the non-significant result contributes to the research, as the construct with its measures can be further used in future research and can continue to be applied within the framework of the conceptual model developed (Mathur & Van der Weele, 2020; Mlinarić et al., 2017). This is especially the case since both validity and reliability are within the accepted range for the construct (Sürücü & Maslakçi, 2020). In this case, as mentioned in the previous sections, changes could be made to the sample size or the sample itself in future research (Visentin, Cleary, & Hunt, 2020). This could be done, for example, if only procurement managers comprised the population in order to avoid inconsistency. The fact that in this work the selected supply chain organisations may have different areas of responsibility (e.g., purchasing, internal logistics, external logistics, production planning) may lead to lower consistency within the supply chain practices and potentially reduce the reliability estimates (Gerhart et al., 2000).

The introduction of further control variables, for example inter-firm trust (Chiles & McMackin, 1996), as well as the possible inclusion of further determinants, for example bargaining power (Huang, Huang, & Chen, 2013) or vertical constraints (Chemla, 2003), in the

conceptual model, and thus the implementation of a different set of variables, as already outlined in Figure 9 and discussed in section 5.5.1, could represent possibilities for future research.

Furthermore, to the author's knowledge, this study is the first of its kind to explicitly examine the relationship between VRIN criteria and vertical integration (in this case, backward integration through M&A); therefore it is neither supported by empirical results from the literature, nor does it contradict comparable empirical results.

6.6 H6 - The greater the extent to which a supplier's supplier base possesses VRIN resources, the more likely it is that the buyer will merge with or acquire the supplier.

The sixth hypothesis deals with the relationship between the acquired resources from the supplier's supplier base and vertical integration, depending on the level of VRIN criteria of the resources. In the analysis in Chapter five, it was revealed that there was a positive relationship between the constructs of VRIN criteria of resources (of the supplier's suppliers) and vertical integration through M&A, but it was also shown that there is no significant influence. Unsurprisingly, this type of result is similar to the previous analysis of H5, which also examines the relationship between VRIN criteria and vertical integration, albeit in a modified form, not focussing on the resources of the direct potential M&A target.

This hypothesis is based on the theoretical foundation derived from the combination of propositions of RBV and the internal logic of ERBV. According to RBV, acquisition is a way of creating competitive advantages through the internal bundling and combination of resources; that is, within the boundaries of the company (Barney 1999, 2009), although supporters of ERBV emphasise that competitive advantages can be generated not only within the boundaries of the company through strategic resources, but that these can also be used outside the governance mode of the firm to create competitive advantages (Ali & Abou, 2021; Cao &

Zhang, 2011, Lewis, 2000; Squire, Cousins, Lawson, & Brown, 2009; Park, Lee, & Koo, 2017; Yang et al., 2019).

This makes sense, especially in light of the fact that suppliers can also be understood as virtual extensions of the supply chain (Gandhi et al., 2017; Mason, 1996; Copacino, 1996), which in turn leads to the proposition that competitive advantages can be realised through mergers or acquisitions with suppliers, both with the directly acquired resources from the M&A deal and with the resources of the supplier base of the then internalised supplier.

Following this line of reasoning, from the ERBV perspective, M&A can be seen as an extension, and from the resource perspective, an improvement of the supply chain that goes beyond the firm's boundaries. That is, M&A could generate competitive advantages from the supply chain perspective by assuring access to resources from the next level but one within the extended supply chain. Therefore, the theory suggests that if competitive advantages can be expected from access to the resources, that is VRIN resources, of a supplier's suppliers, the VRIN resources of the supplier base of the supplier to be acquired and backward integration through M&A along the supply chain show a positive correlation.

However, this study has been unable to empirically support this logical conclusion derived from the literature. Nevertheless, according to the literature review conducted, there are no comparable empirical studies to date that have investigated the relationship between the VRIN criteria of resources of the supplier's supplier base and vertical integration through M&A based on the theory of the extended resource-based view. Therefore, this is also a contribution to the research field of RBV theory and its extension, ERBV.

The mere fact that the construct (VRIN criteria) and its measures have not yet been used in scholarly work adds value to future research because, as explained in the context of other nonsignificant findings in this work, further studies could use the variable (including its measures) and the conceptual model adaptively; for example, by retesting the hypotheses while defining the population under study differently, attempting to include other external factors that

have not been controlled for, or incorporating other variables into the conceptual model (Mathur & Van der Weele, 2020; Mlinarić, et al., 2017).

## 6.7 Summary

The results of this study, which have been discussed on the basis of the hypotheses, show that five of the identified determinants (asset specificity, environmental uncertainty, closeness of competences, VRIN criteria of supplier, and VRIN criteria of the supplier's supplier base) have a positive impact on vertical integration, with two of these, namely asset specificity and closeness of competences, showing a significant relationship with backward integration through M&A.

The fact that asset specificity has a positive and significant impact on vertical integration reflects the findings of several other researchers who have examined vertical integration as a dependent variable in relation to independent asset specificity. This study contributes to these works by supporting them and by presenting an empirical investigation into the backward integration of suppliers. Moreover, asset specificity has been confirmed as a determinant of vertical coordination along the supply chain, up to vertical integration as the highest level of integration. Previous studies have not addressed supplier integration, but rather the vertical integration of specific transactions or the creation of products or services. M&A with suppliers as an object of study has to date only appeared as a theoretical aspect in connection with asset specificity (e.g. Cox, 1996) but this connection has neither been theorised nor empirically tested.

This study supports those researchers who have raised concerns about the hypothesis that uncertainty is associated with a governance mode that moves towards vertical integration. According to the literature review, empirical work has focused on vertical integration, but not on the vertical integration of suppliers through M&A, so this study is the first to use environmental uncertainty as a construct to build a theoretical framework conducive to



investigating the determinants of backward integration through M&A. The finding that there is no significant relationship between asset specificity and backward integration through M&A is understandable in light of the fact that in an ever-changing economic environment, firms need to remain flexible in order to respond to the speed of market changes (Harrigan, 1985; Jauch, Osborn, & Glueck, 1980; Dreyer & Grønhaug, 2004; Sreedevi & Saranga, 2017).

The finding that transaction frequency has no significant impact on backward integration through M&A therefore does not contradict the argument that vertical integration contrasts with a desirable external relationship with many transactions when an anticipated future transaction outweighs the economic benefit of a one-time opportunistic action that ultimately carries the risk of terminating the exchange relationship. Therefore, transaction frequency reduces the likelihood of opportunism and the need for vertical integration, and following this line of argumentation has no positive impact on the execution of M&A with a supplier (Hobbs, 1996; Ketokivi & Mahoney, 2020). The negative and non-significant correlation between transaction frequency and backward integration supports this argument.

Although some researchers assume that similarity of resources, competencies and business relationships play an important role in M&A, there appears to be little empirical research on this. This study supports research findings that similarity of competencies has an impact on vertical integration and extends these general academic statements by examining the backward integration of suppliers through M&A.

In this study, VRIN criteria from both RBV and ERBV perspectives, that is, the VRIN criteria of the firm's suppliers' resources on the one hand, and those of the firm's suppliers' supplier base on the other, have a positive but not significant influence on backward integration through M&A. The theories and the propositions derived from them in the literature suggest that VRIN resources have an influence on vertical integration, but to the author's knowledge there has been no empirical research on this to date.

The fact that insignificant results were also obtained can be due to various reasons which could be tackled in future research, such as the characteristics of the population; validity and reliability issues of the constructs; other variables that were not included; sample size; or variables that could not be controlled for in the study. This study has attempted to exclude these issues, but some insignificant results were still obtained. These are nevertheless important for future research, as the variables and measures can be used in future research; for example, in a different setting, in order to achieve new profitable research results.

## 7 Research Conclusions

This study contributes to the understanding of the determinants of backward integration through mergers with, or acquisitions of, suppliers and thus to understanding of boundary decisions from a supply chain perspective. This chapter presents the conclusions of the study in terms of its implications and contributions to the literature and practice, as well as the limitations and future research directions.

### 7.1 Implications and Contributions to Theory

In the following sections, the implications and contributions to theory are presented and discussed in a structured way in line with the respective headings, and are then summarised and reflected upon at the end of the chapter in Table 26, "Overview of contributions to theory".

#### **Multiple theory approach**

In the study, the phenomenon was examined using multiple theories, namely TCT, RVB, and ERVB, which were used to derive the hypotheses and contribute to the investigation of the determinants of backward integration through M&A. The implication is that is only through the combination of both related theoretical strands that consistency emerges in relation to empirical studies on boundary decisions, which is due to the complementarity of the two theories (Carter & Hodgson, 2006). The RBV perspective considers the firm as a governance mode and a way of creating competencies, while the TCT approach considers hierarchy as a governance mode that potentially provides an efficient way to manage transaction costs (Carter & Hodgson, 2006). This also implies that conducting activities within the boundaries of the firm is as much about managing transaction costs as it is about creating competitive advantage by combining resources or competencies (Carter & Hodgson, 2006). This complementarity is

also true for the relationship between ERBV and TCT. While TCT theory focuses on the influence of transaction characteristics (such as asset specificity) on the effective management of firm boundaries, ERBV emphasises the importance of access to external strategic resources for long-term competitive advantage across firm boundaries (Yuan et al., 2020). The views of the two theoretical strands are also complementary in that on the one hand performance should be improved in terms of managing transaction costs through boundary decisions, and on the other, firms strive to achieve competitive advantage through boundary decisions (Yuan et al., 2020). This is also true for both vertical or backward integration and outsourcing (McIvor, 2009; Vivek et al., 2008). A growing body of research has applied the integrated framework of TCT and RBV to the study of outsourcing decisions (McIvor, 2009; Neves et al., 2014; Watjatrakul, 2005).

It is in this respect that this study makes a contribution, by not only integrating TCT and RBV, but also adding the extended version of ERBV. This is an extension of the existing applications, as the study builds a theoretical model that examines the research problem from multiple theoretical angles. Moreover, according to the literature review, these theoretical strands have not been previously applied to the study of M&A within supply chains, but only to the integration of specific transactions. This study provides evidence that M&A with suppliers can be explained in terms of both resource and transaction costs, which is particularly reflected in the positive and significant results of hypotheses H1 and H4.

The study also shows the intertwining of the theoretical strands through the relationship between resources and asset specificity, as high asset-specific investments can also be considered as crucial firm-specific resources or competencies for creating and maintaining strategic advantages (Williamson, 1981; Zhao, Luo & Suh, 2004). Therefore, the results demonstrate the importance of transaction costs, which is reflected in the positive relationship between asset specificity and backward integration through M&A. On the other hand, the positive relationship between similarity of competencies and backward integration through

M&A simultaneously reflects the RBV perspective. This point is elaborated below as a separate contribution, under the heading "Relationship between RBV and TCT in measuring M&A with suppliers".

### **TCT constructs measuring M&A with suppliers**

An empirical investigation was conducted to test the relationships between TCT constructs, including asset specificity, environmental uncertainty, and transaction frequency, and backward integration with suppliers through M&A. This represents an original approach, as previous studies have considered vertical integration, but the constructs and metrics presented in this study have not been investigated or empirically tested for either backward integration of suppliers or integration through mergers and acquisitions. This contribution is then reflected in the development and implementation of the conceptual models.

In turn, the conceptual model is subjected to ten variables derived from TCT, on which future studies could be based in order to further deepen the research on the determinants of backward integration. These variables are the specific skills required to manage the relationship; the time required to acquire knowledge of the supplier's technical or service standards; use of specific resources to adapt procedures or routines; training and development expenses; the availability of alternative suppliers; uncertainty about quality; the complexity of the market; saturation of market supply; price volatility; and procurement and transaction frequency compared to other suppliers. Therefore, the study contributes to the research area of TCT and boundary decisions within the supply chain by providing a theoretical framework that incorporates TCT-relevant constructs for further investigation.

The study also contributes to the theoretical foundations of TCT, in that it essentially confirms that there are certain transaction characteristics that form the basis for inferring the choice of governance, that is, the choice between hierarchy and market (Williamson, 1985,

1989), and that firms tend to engage in backward integration when transaction costs can be reduced (Williamson, 2008). That cost reduction can be achieved under certain conditions by expanding firm boundaries through vertical integration (Argyres & Zenger, 2012) was only empirically proven for asset specificity in this study, but not for the other cost constructs (uncertainty and transaction frequency).

### **The limited predictability of TCT for backward integration**

Contrary to the assumption that transaction costs can predict which form of governance is beneficial from a cost-benefit perspective (Williamson, 1991; Zylbersztajn, 2018), this study shows that TCT is not fundamentally a predictor of vertical integration from the supply chain perspective. This is demonstrated by the fact that only one of the three TCT constructs, asset specificity, has a significant and positive effect on backward integration through M&A. Moreover, the study has not demonstrated a significant relationship between environmental uncertainty and transaction frequency in vertical integration through M&A. The resulting inability of TCT theory to fully predict backward integration contributes to the ambivalent findings of previous studies in the area of TCT and firms' boundary decisions.

While transaction frequency has been less frequently studied, empirical results on environmental uncertainty have shown positive (e.g., Escuer et al., 2013; John & Weitz, 1988; Levy, 1985; Masten, 1984; Shukor, Newaz, Rahman, & Taha, 2020; Yu et al., 2021), negative (Gatignon & Anderson, 1988) and non-significant associations with vertical integration (Anderson & Schmittlein, 1984; Maltz, 1994). Contrary to the theoretical argument that high levels of uncertainty tend to lead to vertical integration (e.g., Hobbs, 1996) and that the decision whether transactions should be internal or external depends, among other factors, on the frequency of transactions (Williamson, 1983), H2 and H3 failed to confirm this. The implication for the theory here is that apparently not all constructs relevant to transaction costs have an

impact on boundary decisions per se, but that individual elements of TCT theory, such as asset specificity, can have a stand-alone impact.

Furthermore, the positive impact of this construct on backward integration through M&A underlines the importance of the quality (level of asset specificity) of the inter-party relationship (e.g., Klein et al., 1978; Williamson, 1981). Consequently, according to the study findings, the evaluation of boundary decisions from a transaction cost perspective is neither concerned with quantity (transaction frequency) within the buyer-supplier relationship nor with external factors (environmental uncertainty), but with the qualitative relationship between the parties involved in backward integration, as reflected in the construct of asset specificity. Nevertheless, a different picture could emerge in future studies if appropriate adjustments were made to the survey, the possibilities of which are discussed in Chapter 7.4.

### **Asset specificity predicting M&A with suppliers**

The empirical results reveal that asset specificity has a significant and positive impact on M&A with suppliers. This means that the general relationship between asset specificity and vertical integration is confirmed. This contributes both to studies that have also empirically demonstrated this relationship, and to the theoretical assumption that decisions about governance choices are based on transaction costs, with high asset specific transactions tending to be conducted within the firm (Williamson, 1999).

The originality of this study is that it not only contributes to the fact that asset specificity is a construct impacting the way governance is conducted (e.g., de Souza Filho & Miranda, 2019; Joskow, 1988; Mahoney, 1992; Shelanski & Klein, 1995), but for the first time it also proves the relationship between asset specificity and backward integration of a firm's suppliers through M&A. Moreover, the results show that the buyer-supplier relationship is crucial in backward integration decisions. The study ultimately confirms the proposition put forward by

Cox in 1996. That is, the higher the asset specificity in the buyer-supplier relationship, the further the mode of governance moves away from the spot market toward vertical integration through mergers and acquisitions at the end of the vertical coordination spectrum.

Since asset specificity can also be viewed as core competencies (Prahalad & Hamel, 1990), that is, the specific capabilities and skills of a firm (Cox, 1996), this study also demonstrates that the more specific the capabilities and skills involved in the buyer-supplier relationship, the more likely M&A, namely backward integration, will occur.

The study not only supports existing research approaches in the literature, but also contributes to explicitly broadening the field of research by applying the study to M&A, rather than merely examining the integration of specific transactions.

### **RBV constructs measuring M&A with suppliers**

As with TCT theory, no empirical studies based on RBV theory have to date been conducted that derive determinants of vertical integration from RBV in order to investigate their influence on the backward integration of suppliers. Boundary decisions have generally been studied less from the RBV perspective than from that of TCT. In this study, the constructs of VRIN criteria and closeness to competences were developed and represented by 19 variables within the conceptual model.

The study contributes to the research field of RBV and boundary decisions by creating a conceptual model, proving that the relationship between RBV-derived variables and their effects on mergers and acquisitions with suppliers can be measured from an RBV perspective. Considering that the results could only establish a significant relationship for one of the three RBV-driven hypotheses, this framework will be beneficial for future research, which in turn will add value to the research field through adaptations of the study, as described in detail in Chapter 6.



The study also contributes to the creation of new knowledge by addressing the backward integration of the supplier as a stand-alone firm and not only the specific resources of that firm. In addition, the thesis shows that the specifics of the resources (VRIN criteria) are less relevant in this particular study than the similarity of the resources of the parties involved per se, which is reflected in the result of H4.

A contribution is also made through the partial substantiation of RBV propositions, that corporate growth can be achieved by acquiring external resources, for example through M&A (Penrose, 1959) in order to acquire strategic assets (Deng, 2009) related to the firm's own competencies (Santos & Eisenhardt, 2005; Winter, 1988), which serves to realise competitive advantage (Amit & Schoemaker, 1993).

### **Closeness of competences predicting appropriability for M&A**

Evidence that proximity of competence has a positive and significant effect on backward integration through mergers and acquisitions (H4) contributes to RBV theory, in that this study has proven that RBV can make predictions about the boundary decisions of firms within the supply chain. The positive impact of this construct on M&A with suppliers supports the theoretical proposition of Richardson (1972) and Winter (1988), that firms tend to expand their boundaries toward areas where their existing comparable capabilities and competencies can be utilized to create new value and gain comparative advantage, which had not been tested in the backward integration context.

Accordingly, this study makes an empirical contribution to the theoretical assumption of RBV research that to achieve competitive advantage, firms grow by expanding activities that are related to existing ones (e.g., Barney, 1991; Santos & Eisenhardt, 2005; Teece et al., 1994; Winter, 1988) and in which the similarity and complementarity of resources play an important role (Tanriverdi & Venkatraman, 2005; Wang & Zajac, 2007).

The results of this study also confirm that the external growth of a firm can be driven not only by its ability to leverage resources, but also that its internal growth can be driven by mergers and acquisitions and thus by the internalisation of external resources (Penrose, 1959). The question of integration is also addressed by understanding the relationship between existing capabilities and the new ones required to perform a new activity (Richardson, 1972; Winter, 1988). This study also contributes to previous empirical research by broadening the perspective to the new context of vertical integration of suppliers through mergers and acquisitions; previous studies have only examined the vertical integration of activities within a supply chain, but not vertical supplier integration per se (e.g., Gulbrandsen et al., 2009).

### **Connection between RBV and TCT in measuring M&A with suppliers**

Both hypothesis H1, derived from TCT theory, and hypothesis H4, derived from RBV theory, were confirmed; that is, asset specificity, as well as the degree of proximity between the buyer's existing competencies and those required for a given supplier activity, were found to positively influence the implementation of backward integration through M&A.

The implication of this and the contribution to the theory is rooted in the connection between RBV and TCT theory. This is because asset specificity is also correlated to a firm's core competencies (Prahalad & Hamel, 1990), which should consequently be retained in the firm (Cox, 1996; Richardson, 1996). High asset-specific investments are also seen as crucial firm-specific resources for creating and sustaining strategic advantage (Williamson, 1981; Zhao, Luo, & Suh, 2004).

The TCT-based model proposed by Cox (1996) reflects this relationship; according to his "continuum of asset-specific external contract forms," the closer the goods or services to be acquired are to the firm's competencies and know-how, that is, its core competencies, the more likely a firm is to engage in mergers and acquisitions (Cox, 1996).

Following this logic, it is conceptually understandable that competence proximity and asset specificity have a positive effect on backward integration through M&A and therefore contributes to the propositions of Cox (1996). This also supports the view that only by combining both theories will coherence emerge in the study of vertical integration within the supply chain (Carter & Hodgson, 2006).

### **VRIN criteria as a construct measuring M&A with suppliers**

While the similarity of competencies has a positive and significant impact on backward integration, the VRIN criteria of suppliers' resources were found to have no significant impact on backward integration. As such, this study contributes to RBV research by concluding that these criteria appear to be less appropriate than the proximity of competencies, which appears as a construct in previous research only in the context of vertical integration of transactions (see Gulbrandsen et al., 2009), as opposed to vertical integration through M&A within supply chains.

The study also contributes to the theory by not confirming the proposition derived from the theory, namely that a motive for conducting M&A is the acquisition of strategic assets (Deng, 2009), that is, assets or resources that serve to realise competitive advantages (Amit & Schoemaker, 1993), and which are represented by resources that possess the VRIN criteria (Barney, 1991, 1999).

In addition, given the previous explanations that high asset-specific investments (which have been shown to have a positive impact on mergers and acquisitions) are also considered a crucial firm-specific resource (Williamson, 1981; Zhao, Luo, & Suh, 2004), it would be expected that the VRIN criteria are also positively associated with backward integration through mergers and acquisitions. Nevertheless, the specific features of the criteria (valuability, rarity, inimitability and non-substitutability) are not explicitly attributed to the asset-specific

investments from TCT theory. This is also reflected in the fact that the asset specificity measures used in empirical research do not include the VRIN criteria.

This study also contributes to the theory, as future research could further explore this relationship based on its results and constructs. According to the literature review, no studies to date have examined the relationship between VRIN criteria & M&A expressed in hypothesis H5. The implication for theory is that the resources for the VRIN criteria, even if they realise sustainable competitive advantages for a firm (Barney, 1991), do not initially influence boundary decisions or M&A. This correlation should be verified or rejected in future research studies. At the same time, this work makes an original contribution to the literature by using the VRIN criteria in a new setting to study boundary decisions within the supply chain, on which further research could be conducted.

### **The ERBV construct for measuring M&A with suppliers**

The novelty of VRIN also applies to the ERBV or VRIN criteria of the supplier base, which have not been used in the literature to study backward integration. The addition of the extended RBV to the consecutive model represents at the same time an extension of the research on vertical integration, because in contrast to RBV, from the perspective of ERBV strategic resources can also be considered outside the company boundaries in order to realise competitive advantages (Ali & Abou, 2021; Cao & Zhang, 2011, Lewis, 2000; Squire, Cousins, Lawson & Brown, 2009; Park, Lee, & Koo, 2017; Yang et al., 2019). These resources are represented by the supplier base of the potential supplier who is one step further up the supply chain.

The hypothesis H6 derived from the ERBV showed no statistical significance. Therefore, according to this study, the VRIN criteria of the suppliers' supplier base did not prove to be a critical determinant of backward integration through M&A. The implication for ERBV theory is that VRIN criteria are not influential as determinants of vertical integration in

the boundary decision from the supply chain perspective. Future studies should also verify or reject this relationship.

The originality in this case is that according to the literature review, this study is the first to use ERBV theory to go beyond the boundaries of the potential supplier to be integrated and to consider the VRIN criteria of the supplier base of the potential supplier to be acquired. For this purpose, a construct was developed with corresponding variables derived from RBV research. Although the influence of the VRIN criteria of the supplier's suppliers on backward integration through M&A was found to be positive but not significant, this research represents a contribution to future studies as an approach to ERBV research in relation to the boundary decisions of firms.

The contributions and their theoretical classification are presented in Table 26 in a clear and concise manner. The extent to which the results of this study contribute to practice and their implications are discussed in the following section.

Table 26: Overview of the contributions to theory (source: author)

No.	Contribution Headline	Brief Description	Underlying Theory
1	Multiple theory approach	<ul style="list-style-type: none"> <li>- Integration of TCT, RBV and ERBV to investigate the determinants of vertical integration.</li> <li>- Extension of the existing applications of these theoretical strains, in that three theories have been used in this thesis to establish a theoretical model that examines the research problem from two different perspectives.</li> <li>- The study proves that M&amp;A from a supply chain perspective can be examined and explained both in a resource-driven and transaction cost-driven way.</li> </ul>	TCT, RBV, ERBV
2	TCT constructs measuring M&A with suppliers	<ul style="list-style-type: none"> <li>- Novel use of TCT-derived constructs in the context of backward integration of suppliers through M&amp;A.</li> <li>- New theoretical TCT framework developed, represented by ten variables derived from the literature, within the conceptual model.</li> </ul>	TCT
3	The limited predictability of TCT for backward integration	<ul style="list-style-type: none"> <li>- Expanding knowledge of TCT: the theory's claimed predictability of TCT for boundary decisions was partially disproved.</li> <li>- Only one of three constructs shows a positive impact on backward integration with suppliers.</li> <li>- No significant impact of either environmental uncertainty or transaction cost theory on backward integration through M&amp;A.</li> </ul>	TCT
4	Asset specificity predicting M&A with suppliers	<ul style="list-style-type: none"> <li>- Supporting the TCT proposition: the study underlines the inherent assumption in TCT that high asset specificity is positively related to vertical integration.</li> <li>- The originality is that this construct has been used to study backward integration of suppliers through M&amp;A and proves the positive impact of asset specificity.</li> </ul>	TCT
5	RBV constructs measuring M&A with suppliers	<ul style="list-style-type: none"> <li>- The first empirical study to draw on RBV theory by deriving the determinants of vertical integration from RBV to investigate their influence on backward integration of suppliers.</li> <li>- Development of a new theoretical RBV framework represented by 19 variables derived from the literature, within the conceptual model.</li> </ul>	RBV
6	Closeness of competences predicting M&A with suppliers	<ul style="list-style-type: none"> <li>- Novel insights through the first empirical investigation of the proximity of competences between buyer and supplier, with the result showing a positive impact of these on backward integration through M&amp;A.</li> <li>- Support for the very few studies that have investigated the proximity of competences and the impact on vertical integration.</li> </ul>	RBV
7	Connection between RBV and TCT for measuring M&A with suppliers	<ul style="list-style-type: none"> <li>- Empirical underpinning of the links between RBV and TCT as high asset-specific investments also seen as firm-specific resources (competences) for creating competitive advantage.</li> <li>- New empirical evidence: the closer the supplier is to the firm's core competencies (also equated with asset specificity), the more likely a firm is to engage in M&amp;A. This is proven by the positive impact of both asset specificity and closeness of competences on backward integration with suppliers through M&amp;A.</li> </ul>	RBV, TCT
8	VRIN criteria as a construct to measure M&A with suppliers	<ul style="list-style-type: none"> <li>- VRIN criteria of supplier's resources did not prove to be a determinant of M&amp;A with a supplier.</li> <li>- The first study to establish VRIN criteria as a construct to measure M&amp;A.</li> </ul>	RBV
9	ERBV construct for measuring M&A with suppliers	<ul style="list-style-type: none"> <li>- Development of a new construct derived from RBV theory and adapted to test the ERBV theory in relation to backward integration through M&amp;A.</li> <li>- The VRIN criteria of the supplier's supplier base not proven to have a significant impact on backward integration with suppliers through M&amp;A.</li> <li>- This study is the first to use ERBV theory to go beyond the boundaries of potential suppliers to be integrated and to consider the VRIN criteria of the suppliers of the potential supplier to be vertically integrated through M&amp;A.</li> </ul>	ERBV

## 7.2 Implications and Contributions to Practice

This section presents and discusses the implications and contributions for practice, which are then summarised and reflected on again at the end of the chapter in Table 27, "Overview of contributions for practice".

### **Assessment of RBV and TCT metrics for M&A with suppliers**

A key contribution of this work is the recognition that it is important for supply chain managers and decision makers to focus on and analyse specific determinants of vertical integration when conducting mergers and acquisitions with a supplier. Following the results of the study, two constructs, asset specificity and closeness of competencies, are of particular relevance. Accordingly, managers should consider making an assessment of their asset specificity in relation to the transactions with the supplier, together with an assessment of the similarity of their own competencies and those of the supplier which are necessary for the creation of the goods or services sourced from the supplier.

The findings of this study provide managers, researchers and experts in the field of supply chain management with insights into the determinants of backward integration through M&A. The study marks the beginning of an academic work that examines the determinants of backward integration with suppliers from both a transaction cost and an (extended) resource-based perspective and derives practical implications and insights. The results of the work are particularly relevant for practitioners facing boundary decisions within the supply chain.

### **Assessment of asset specificity between a firm and its supplier**

Supply chain managers should pay particular attention to the relationship between suppliers and buyers when considering the implementation of M&A. This is because they need

to find ways to identify and understand the level of asset specificity, whose factors are represented by the measures in this study. Firms should consider whether there are specific skills required in the buyer-supplier relationship that are necessary for managing the relationship with the supplier.

The buying company must identify whether specific knowledge is required to understand the supplier's work processes. In addition, the time required to gain specific knowledge of the supplier's technical or service standards should be reviewed. In addition, managers should assess whether they have devoted specific resources to training the supplier's employees and aligning them with the supplier's procedures, which is a prerequisite for a functioning buyer-supplier relationships and transactions. These assessments can help the buying company understand the level of specificity of the asset and thus make more informed boundary decisions about M&A with a supplier.

The results of this study may suggest the need for firms to consider a systematic approach to implementing such an assessment, at least for those firms that not only focus on the external supply of goods and services, but also have the vertical integration of their suppliers, for example through mergers or acquisitions, on their management agenda as a strategic variant of their procurement strategy.

As an initial framework or basis, the "continuum of asset-specific external contractual forms" already developed by Cox in 1996 could provide a general structure within which different governance forms (preferred suppliers, single sourcing relationships, network sourcing, strategic supplier alliances, M&A) are presented as beneficial, depending on the degree of asset specificity. It became evident that this study has focused solely on M&A, but in future studies this framework could also provide an approach from a scholarly as well as practical perspective to analyse the interrelationships of the different degrees of asset specificity and their impact on contractual and governance forms.



### **Environmental uncertainty should not be overstated in M&A with suppliers**

The results of this study, which show an insignificant impact of environmental uncertainty on M&A with suppliers, suggest that decision-makers and executives within corporate supply chain management should not overstate environmental uncertainty when making decisions about backward integration through M&A. This implies that the availability of alternative suppliers or uncertainty about the quality of products or services sourced from the supplier do not play an overriding role in the governance mode or M&A. Similarly, the availability of alternative suppliers or uncertainty about the quality of products or services procured from the supplier do not take precedence in merger and acquisition decisions with suppliers. Other factors, such as market complexity or the stability of market supply, also do not appear to be determinants for supply chain managers to consider when deciding on a supplier's M&A suitability.

### **Transaction frequency should not be misinterpreted in M&A with suppliers**

The fact that transaction frequency has a negative and non-significant impact on backward integration through M&A has an implication for practice, in that supply chain managers and decision-makers involved in boundary decisions should not be blinded by high transaction frequency. The claim that high frequency transactions are beneficial for M&A is not supported by the thesis. This means that supply chain managers and decision-makers need to keep track of neither the transaction frequency in terms of the procurement of goods, nor of the order frequency in comparison to other suppliers when making boundary decisions regarding potential mergers or acquisitions with their suppliers. Accordingly, it is not the quantity of transactions that is decisive, but the quality of the underlying characteristics of the relationship (degree of asset specificity) between buyer and supplier.

## **Assessment of competencies of a firm and its supplier**

The question of whether vertical integration is beneficial can be answered by assessing the relationship between existing competencies and the new ones required to perform a new activity (Richardson, 1972; Winter, 1988). This is precisely what was evidenced in this study and reflects the practical implications.

The study findings suggest that companies seeking to make supply chain boundary decisions need to focus on analysing and understanding their own competencies relative to those of their target suppliers. In this context, it is necessary to assess the degree of similarity between the buyer and the supplier in terms of the competencies required to produce the goods or services purchased from the supplier. The supply chain task is therefore to find ways to assess the skills and capabilities underlying the creation of products or services and to compare them with their own in assessing the suitability of suppliers for potential M&A. Relevant parameters for such an assessment can also be derived from this study. For this reason, it is advisable for managers and decision makers to examine the competencies, reflected in the measures in this study, that the supplier employs to deliver its products and services.

This in turn presupposes that the buyer-supplier relationship involves sufficient transparency to allow these insights to be obtained. Therefore, one of the roles of supply chain leaders is to build a relationship with their suppliers that enables them to gain such insights. The same applies to the knowledge of the supplier's employees, which must be compared with that of the supplier's own employees in terms of similarity. In addition, it is necessary to evaluate which competences are needed for production, or which are held by the supplier, and the degree of similarity the firm's own competences have in comparison. It would also be useful to evaluate the routines and procedures followed by the supplier to produce the supplied goods and to compare these with those of the firm in order to be able to determine the similarities.

The development of this comprehensive evaluation system is both a practical contribution and a necessary management task. If a high degree of similarity of the competences can be determined in the assessment, this then represents an indication or a determinant for practice, on the basis of which mergers or acquisitions can be derived as an appropriate supply chain-related strategy.

### **VRIN criteria should not be determined in practice**

While similarity of resources (competencies in particular) is considered an important determinant of backward integration through mergers and acquisitions, the characteristic features of the resources of suppliers, such as value, rarity, inimitability, and non-substitutability (i.e., the VRIN criteria), were found not to be significant determinants of mergers or acquisitions with suppliers. Therefore, supply chain executives generally need to give less weight to these specific features of resources when considering an M&A project with a supplier. This applies both to the direct suppliers themselves and to their supplier base.

In summary, one central practical task of supply chain management in the context of boundary decisions lies on one hand in the assessment of asset specificity-related factors, and on the other in the assessment of competencies that concern both the firm and the supplier. The quality of the relationships with the relevant suppliers, as well as the systematic evaluation of this quality, seems to be a crucial success factor in accomplishing this task in order to determine the fitness of suppliers for backward integration through M&A. The results, in combination with the theoretical arguments, provide improved insight into the determinants of vertical integration, allowing decisions on backward integration through M&A to be made in a more informed manner. The contributions to practice, the respective theoretical contributions and the underlying theories are summarised in Table 27.

Table 27: Overview of contributions to practice (source: author)

No.	Contribution Headline	Brief Description	Underlying Theory	Related Theoretical Contributions
1	Assessment of RBV and TCT metrics for M&A with suppliers.	- Development of a comprehensive assessment system is recommended to ensure that the relevant influencing factors can be reviewed systematically and sustainably.	TCT, RBV, ERBV	1-9
2	Assessment of asset specificity between a firm and its supplier.	- A buying firm's relationships with its key suppliers need to be examined to gain insights into the asset specificity of the buyer-supplier relationship. - Assessment of asset specificity by assessing the following influencing factors: specific skills required in the buyer-supplier relationship; specific knowledge required to understand the supplier's work processes; time taken to acquire specific knowledge of the supplier's technical or service standards; specific resources needed to train the supplier's staff or to adapt to the supplier's procedures.	TCT	4, 7
3	Environmental uncertainty should not be overstated in M&A with suppliers.	- Availability of alternative suppliers and uncertainty about the quality of products or services sourced from the supplier do not necessarily play an overriding role in governance mode decisions in practice.	TCT	3
4	Transaction frequency should not be misinterpreted in M&A with suppliers.	- No need to keep track of the transaction frequency in terms of the procurement of goods or of the order frequency in comparison to other suppliers when making boundary decisions. - It is not the number of transactions that need to be assessed, but the quality (level of asset specificity) of the relationship between the buyer and supplier.	TCT	3
5	Assessment of the competencies of a firm and its supplier.	- The buyer-supplier relationship needs to establish sufficient transparency to obtain the required insights into the competences that the supplier has in creating its products and services. - The following factor should be taken: compare knowledge of the supplier's employees with that of the buyer's own employees; evaluate the competences needed for production; evaluate the routines and procedures followed by the supplier for the production of its supplied goods; and compare one's own routines and procedures with these.	RBV	6, 7
6	VRIN criteria should not be determined in practice.	- The characteristics of the resources in the buyer-supplier relationship do not need to be given great weight in practice. - In particular, the combination of the value, rarity, inimitability, and non-substitutability features do not represent a significant factor in boundary decisions.	ERBV, RBV	8, 9

### 7.3 Research Limitations

In addition to the stated implications and contributions of the thesis, it also has limitations, which are discussed below. It is important to be transparent in outlining these, together with the exceptions and caveats of the study (Creswell, 2013).

First, while the cross-sectional design has many advantages (it is comparatively quick and inexpensive to conduct, there are no ethical difficulties, hypothesis generation is straightforward, and many results can be used for a more in-depth study), there are also limitations, because in such studies it is difficult to draw causal conclusions; established associations may be difficult to interpret; and they are prone to non-response bias (Wang & Cheng, 2020). Therefore, although it can be argued that some of the identified determinants of vertical integration have an impact on it through M&A, the cross-sectional design implies a lack of reverse causation. Therefore, longitudinal studies can be conducted to detect changes over time, to gain deeper insights into cause-effect relationships, and to allow reverse causation, although a drawback of this study design is that it is both more expensive and time-consuming (Bell, 2021).

Second, although hierarchical multiple regression analysis is an appropriate method in the context of this study, an alternative would be to use structural equation modelling (SEM). Especially when a longitudinal study is to be conducted, SEM is the better method (Gunzler, Chen, Wu, & Zhang, 2013), which was not the case in this cross-sectional study. SEM has advantages, especially when mediating variables are used (e.g., as suggested for future research) as the causal relationships in a hypothetical mediation process; the simultaneity of indirect and direct effects; and the dual role of the mediator as the cause of the outcome can be better represented with structural equations than with regression analysis (MacKinnon & Fairchild, 2009).

Third, an attempt was made to find a sampling frame that would represent the entire population. Since no such frame could be identified, the random sampling method was used to

create a suitable one. The non-probability or non-random sampling method has advantages, such as easy accessibility, availability at any given time and the willingness of study participants to participate (Dörnyei, 2017). Even though an attempt was made to represent the population as well as possible through the sample, such an approach has its limitations. One risk is that certain people are over-represented or under-represented, or that the intended sample is too homogeneous (Etikan, Musa, & Alkassim, 2016). Another disadvantage of random sampling is that it is likely to be biased (Mackey & Gass, 2015), which the present study sought to avoid by randomly selecting the sample from the collaborating supply chain consultancy network. There is also a risk of creating many outliers (Etikan, Musa, & Alkassim, 2016), although this risk was statistically well addressed in the study.

Fourth, the fact that the independent variable (backward integration through M&A) includes hypothetical choices is associated with the risk that respondents have little incentive to answer the hypothetical questions correctly (e.g., Grether & Plott, 1979; Grether, 1980; Slavic & Lichtenstein, 1983). This technique was nevertheless used in the thesis because the research also makes a contrary statement, namely that measures of hypothetical choices are valid indicators and that they have fewer weaknesses than assumed (Whyte, 1994). Accordingly, an incentive to answer the questions has no impact on correctness (Grether & Plott, 1979; Tversky & Kahneman, 1986). Furthermore, it was shown that hypothetical choices were an appropriate approach for the study. Nevertheless, a study that does not include hypothetical choices would further eliminate the risk of incorrect responses.

Fifth, although the entire population of SCM-focused companies in Germany which could theoretically conduct M&A with their suppliers was addressed (through a corresponding sample), the study is only valid for one country. In terms of generalisability, a more international population could have been addressed.

Sixth, the identified determinants of vertical integration through M&A with suppliers cannot claim to be exhaustive, but must be understood as a limited reflection of them.

Nevertheless, the most commonly used determinants of vertical integration identified from the resource-based view and transaction cost-based perspective were utilised, extended and adapted.

Seventh, it should be noted that the study was not able to represent all the factors that have an impact on backward integration through M&A with firms' suppliers. The value of R<sup>2</sup> (R<sup>2</sup> = 0.334, p < .001) from the model summary shows that 33.4% of the explanatory power of backward integration through M&A can be attributed to the determinants of vertical integration used. Therefore, in addition to the variables derived from the constructs in the study, several other influencing factors exist. These include the factors discussed in the literature review, such as financial synergies (Eun & Resnick, 2010); operational synergies (Gupta & Gerchak, 2002); economies of scale (Christensen et al., 2011; Hassan & Mayrhofer, 2018); bargaining power (Carney, 2009; Huang, Huang, & Chen, 2013); market share (Carney 2009); new market entry (Seth, Song, & Pettit, 2000; Sudarsanam, 2003; Weber, 2019); vertical restraints (Chemla 2003); or CEO compensation (Bliss & Rosen, 2001; DeYoung, Evanoff, & Molyneux, 2009). In the study, due to the theory-based delineation (ERBV, RBV, and TCT), a corresponding demarcation was made, and consequently not all the listed factors became part of the conceptual framework.

Eighth, the occurrence of non-significant results also raises the question of possible limitations in the conduct of the study. It is important that the constructs are both reliable and valid (Sürücü & Maslakçi, 2020). Although all the constructs are in acceptable ranges, a larger sample would have tended to result in better validity and reliability scores, as well as contributing to the avoidance of non-significant results (Blackford, 2017; Visentin, Cleary, & Hunt, 2020). Furthermore, it cannot be ruled out that the introduction of additional control variables or the inclusion of other strong factors in the conceptual model that mask the effect of the variables used might have increased the chance of more significant results (Frank, 2000). Even though an attempt was made to represent the population as well as possible, there may

still have been over- or under-representation in the random selection process, with the risk of over-homogeneity (Etikan, Musa, & Alkassim, 2016), which may ultimately have also affected the significance. In this context, the study of subgroups could have been an option. A subgroup is a subset of the sample defined by certain common baseline characteristics; the study analysis is repeated within these subgroups to determine the extent to which the strength of the effects, or even their direction, differs between them (Borenstein & Higgins, 2013). This would again require a larger sample size, otherwise the statistical power within the subgroup would tend to be too low to produce significant results (Borenstein & Higgins, 2013).

Finally, due to the still largely unresearched interrelationship of the determinants used with backward integration through M&A, in some cases only limited content-related information is available, which means that it was not possible to draw consistently on already fully established chains of argumentation in the context of the specific interrelationship of the constructs with backward integration through M&A. Therefore, qualitative research can provide support in this respect to generate in-depth insights into the area of less researched constructs, such as VRIN criteria as influencing factors in M&A with suppliers, to probe and obtain rich descriptive data about such factors (Mohajan, 2018; Van Maanen, 1983). Possible methods employed could include case studies or interviews (Aguinis & Solarino, 2019).

Notwithstanding the research limitations presented, the results of the study represent important research contributions to the literature on the relationship between TCT and RBV-driven determinants of vertical integration. An important contribution is also made to closing the related research gap and providing concrete evidence of the relationship between determinants of vertical integration and backward integration through M&A. The study also provides implications for theory, practice, and methodology, and the conceptual framework developed could serve as a basis for future studies. Corresponding future directions are discussed accordingly in the following section.



## 7.4 Future Directions

Globally, the number and volume of mergers and acquisitions increased from 75,360 worth \$3,752.7 billion in 2009 to 96,665 worth \$4,734.2 billion in 2016. Companies are therefore being proactive in defining their corporate boundaries, and managers and decision-makers need to make important judgments when it comes to shaping and defining the boundaries of the company; that is, which business activities should be part of the company and which should be outsourced.

Ultimately, from a supply chain perspective, this also includes answering the question as to which suppliers should be considered for M&A. According to this study, both resources and transaction costs clearly play a key role in these decisions. It is important to provide guidance to managers and decision-makers. There is still great potential for further research to understand a) which determinants are relevant, and b) how they affect backward integration through M&A. Answering these questions will benefit future research. Therefore, the following future directions are suggested.

First, the causal relationship between the determinants of vertical integration and backward integration through M&A should be clarified and investigated in more depth to allow for reverse causation. In this context, it would be advisable to conduct a longitudinal study in order to detect changes over time, gain deeper insights into cause-effect relationships and allow for reverse causation accordingly. However, such studies are more difficult to realise, and are both more expensive and more time-consuming (Bell, 2021).

Second, an alternative to hierarchical multiple regression analysis applicable to this study is the use of structural equation modelling (SEM) in future studies. This approach is particularly suitable for prospective research that follows the longitudinal study approach described above (Gunzler, Chen, Wu, & Zhang, 2013). This also applies to future studies that include mediating variables, as SEM can then better represent the results, as discussed in the previous section (MacKinnon & Fairchild, 2009).

Third, similar studies which build on the conceptual framework of this thesis could be conducted exclusively with companies that have already undertaken mergers or acquisitions with suppliers, so that hypothetical decisions no longer need to be made. This would ensure that the risk of wrong answers associated with this approach could be eliminated. Moreover, it would further deepen the focus of the study with regard to M&A, as only ones with suppliers that have actually been implemented would be the focus of the analysis.

Fourth, another interesting approach for further research could be to examine the interaction between asset specificity and uncertainty and of asset specificity and transaction frequency and their impact on backward integration. The underlying question is to what extent transaction frequency or environmental uncertainty have an impact on backward integration through M&A in the presence of asset specificity. Approaches to this include studies by Douma and Schreuder (1992) and Williamson (1986), although they deal with vertical coordination and not explicitly with the vertical integration of firms. The approach entails that high asset specificity and high uncertainty tend to lead to vertical integration in such transactions, while low uncertainty and high asset specificity only lead to long-term contracts. These approaches can be used in combination with the framework of this study to investigate M&A with suppliers.

Fifth, other possible future research could be examine the link and overlap between RBV and TCT in more detail when investigating backward integration. In particular, the link between asset specificity and VRIN resources seems to be an interesting aspect, as strategic resources or competencies can also be interpreted as asset specific and are also described as core competencies in the literature (Cox, 1996). In addition, investments with high asset specificity, such as strategic resources, are difficult to imitate (Combs & Ketchen, 1999). In this work, the VRIN criteria of supplier resources had a positive but not significant impact on backward integration. However, it would be interesting to investigate how the assumed relationship between asset specificity and strategic resources or resources with VRIN criteria

would develop if there were a large number of studies on this topic, meaning that conclusions could be drawn.

Sixth, to gain further in-depth knowledge about the determinants of vertical integration with suppliers, qualitative research, such as interviews or case studies, would contribute the procurement of further descriptive data about these determinants (Aguinis & Solarino, 2019; Mohajan, 2018; Van Maanen, 1983). In turn, these could then be used again as the basis for further quantitative research. This recommendation for future research is mainly based on the fact that in this study there is only limited information that allows one to draw on fully established chains of reasoning in the context of the specific relationship of the constructs with backward integration through M&A. For example, this applies to the constructs of the VRIN criteria, which have been not widely researched in the context of vertical integration. In addition, there are many other influencing factors (as outlined below) whose investigation through both qualitative and quantitative research would contribute to the expansion of the research field.

Seventh, as explained in Section 5.5.1, the constructs of the thesis partially explain the execution of M&A with suppliers. Therefore, in addition to the derived constructs based on ERBV, RBV, and TCT, further research could be conducted on other factors that influence such M&A. Some of these possible factors were discussed in the literature review in this study, such as:

- Synergies as the driving force behind financially motivated M&A transactions (Eun & Resnick, 2010).
- Operational synergies; for example, production-related or administration-related efficiency effects (Gupta & Gerchak, 2002).
- Long- and short-term economies of scale and increasing the size of the business (Christensen et al., 2011; Hassan & Mayrhofer, 2018).
- Bargaining power as order quantities may rise (Carney, 2009; Huang, Huang, & Chen, 2013).
- Increasing market share or holding leading market share (Carney 2009).

- Entry into new markets (Seth, Song, & Pettit, 2000; Sudarsanam, 2003; Weber, 2019)
- Vertical restraints that may contribute to the operating costs of the companies before M&A (Chemla 2003).
- CEO compensation (Bliss & Rosen, 2001; DeYoung, Evanoff, & Molyneux, 2009).

Finally, to make the non-significant results of this study applicable to future research, it is recommended to use an adjusted set of variables to complement or reduce the effect of other strong factors that mask the effect of the study variables (Frank, 2000). Future research could also attempt to control for other variables. The adaptation of the sample (e.g., procurement managers only) or a larger sample size could also generally help to produce significant results (Visentin, Cleary, & Hunt, 2020). To counteract publication bias (Miller-Halegoua, 2017), it is also recommended that non-significant results are consistently reported in papers. A major problem is that such results are intrinsically less interesting than ones that confirm the research hypotheses and are therefore less likely to be reported, which is also referred to as the 'pigeonhole phenomenon' (Miller-Halegoua, 2017).

Future research should continue to investigate the factors that might be beneficial for M&A from a supply chain perspective. In doing so, it seems advisable to continue this investigation with the combination of TCT and (E)RBV in order not to have a one-sided investigation, but to use a more holistic framework. Adding variables may be beneficial in the future in view of the insignificant results. The present conceptual framework could continue to be used for this purpose. The focus should then not only be on Germany, but studies could be conducted in different countries and sectors in order to continue to gradually close the research gaps.

## 7.5 Summary

The study has highlighted the implications and contributions to theory. On one hand, it emphasises the fact that the phenomenon under investigation was examined with the help of two theoretical strands (and three theories) and on the other, it also discusses the intersections that manifest themselves, in particular in the overlaps between asset specificity and specific resources or competences. The novelty is the integration of three theories (TCT, RVB and ERVB) to derive hypotheses to investigate the impacts of the determinants of backward integration.

This is the first time that an empirical study has been conducted to examine the relationships between the constructs of TCT and backward integration with suppliers through M&A. In the TCT strand, it has been shown that neither transaction frequency nor environmental uncertainty have a statistically significant impact on vertical integration through M&A with suppliers, which is also consistent with the ambivalent results of previous studies in the area of TCT and firms' boundary decisions. Asset specificity did prove to have an impact, which is also predominantly the case in other empirical research.

To date, no empirical studies based on RBV or ERBV theory have been conducted in which vertical integration determinants have been derived from RBV to investigate their influence on suppliers' backward integration. The RBV strand shows that closeness of competences of the firm (buyer) and supplier has a positive impact on backward integration through M&A. VRIN criteria, on the other hand, from both the RBV and the ERBV perspectives, have no impact on vertical or backward integration through M&A. A positive impact could have been expected from the derivable analogy with asset specificity, but the constructs are structured differently, and asset specificity does not explicitly include valuable, rare, inimitable and non-substitutable factors.

The novelty is that this study highlights for the first time that transaction relevance is reflected by the positive relation between asset specificity and backward integration through

M&A, and that competitive advantage is reflected by the positive relation between competence proximity and backward integration through M&A, insofar as this brings to the fore the overlapping of the two theories, because high asset-specific investments are also considered as crucial firm-specific resources for creating competitive advantage (Williamson, 1981; Zhao, Luo & Suh, 2004).

In practice, it will be important for managers to pay more attention to the supplier-buyer relationship in order to identify and understand the degree of asset specificity. While SCM managers and decision-makers need to pay little attention to environmental uncertainty factors when considering backward integration, they should also not be blinded by high transaction frequency, which has a slightly negative and insignificant impact. As with asset specificity, it becomes important in practice for firms to assess the competencies behind the creation of products or services in order to compare them with their own and thus better assess the supplier's potential suitability for backward integration through M&A.

The study reveals the importance for supply chain managers and decision-makers to focus on asset specificity and closeness of competence when conducting M&A with a supplier, which goes hand in hand with a necessary assessment of these influencing factors. Another contribution of the work is the combination of the theories, in the sense that only by combining them does there seem to be improved consistency in relation to empirical studies on boundary decisions based on TCT, which is ultimately due to the complementarity of the two theories. Furthermore, the study addresses certain research gaps, as it appears to be the first empirical work that examines the relationships between constructs from TCT and backward integration through M&A and simultaneously confirms the influence of asset specificity on vertical integration (with the accompanying extension to backward integration through M&A).

It also fills the research gap with regard to RBV and ERBV by contributing to the specific study of backward integration with constructs derived from them. This goes hand in

hand with the empirically proven finding that mergers and acquisitions with suppliers are positively related to similarity of competences.

The conceptual framework itself can be further used in future studies to investigate the relationship between determinants of vertical and backward integration through M&A. Research limitations arise especially from the cross-sectional design, the sampling approach, the inclusion of hypothetical decisions, the single-country approach and the limited availability of substantive information on some of the research topics.

For future research, it is recommended that more in-depth insights into cause-effect relationships are sought reverse causality by conducting longitudinal studies. Furthermore, it is advised to conduct a similar study exclusively with companies that have already made mergers or acquisitions with suppliers, so that hypothetical choices can be avoided. In addition, the recommendation is made to investigate the interaction between asset specificity and uncertainty and between asset specificity and transaction frequency, together with their impact on backward integration, so that mediating hypotheses can also be tested. The relationship between RBV and TCT (especially the constructs of asset specificity and strategic resources) should also be investigated more closely with regard to backward integration with suppliers. Finally, future studies using the theories of TCT, RBV and ERBV should continue to investigate those factors that are beneficial for M&A from a supply chain perspective. This study offers a valuable framework for this purpose.

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## Appendix A – English Version of the Questionnaire

*Patrick Dümpelfeld*  
*The Business School*  
*University of Gloucestershire, Cheltenham*  
*Gloucestershire, GL50 2RH, UK*



**Dear Participant,**

I am a doctoral candidate at the University of Gloucestershire. I would like to ask for your help in my studies by completing the attached questionnaire on supply chain management and the factors influencing mergers and acquisitions.

This questionnaire is designed to provide insights into how various supply chain determinants affect the overall tendency of a company to carry out mergers and/or acquisitions.

Completing this survey would only take about 7 minutes. **All the information you provide will be kept confidential and anonymous.** The overall results of the survey will be sent to you at your request (by email from the above address).

Thank you very much for your participation.

Patrick Dümpelfeld



## BASIC INFORMATION

**(A) Please provide the following regarding your profession:**

(1) What is your job title? \_\_\_\_\_

(2) In which department are you employed? \_\_\_\_\_

**(B) Please provide the following regarding your organisation:**

(1) Year your company was founded: \_\_\_\_\_

(2) Number of employees in your company: \_\_\_\_\_

(3) In which industry sector is your company operating? \_\_\_\_\_

Please answer the following questions:

C	Opening question
	<p><b>IMPORTANT:</b> Please identify a supplier with whom you consider a merger or acquisition (M&amp;A) to be appropriate and always refer to that supplier when responding. All subsequent statements in this questionnaire refer to the supplier you have identified</p>

**To what extent to do you agree or disagree with each of the following statements? Please select one answer per row:**

1 = Strongly Disagree (SD) 2 = Disagree (DA) 3 = Neutral (N) 4 = Agree (A) 5= Strongly Agree (SA)

#	Statement	SD 1	DA 2	N 3	A 4	SA 5
<b>D</b>	<b>Asset Specificity of Transaction</b>					
1	Employees handling the relationship to the supplier need specific skills to manage this relationship.					
2	During the cooperation with the supplier we had to learn about several aspects of the supplier's operation.					

#	Statement	SD 1	DA 2	N 3	A 4	SA 5
3	Our firm has spent a significant amount of time acquiring knowledge concerning the supplier's technical or service-related standards.					
4	Our company has used specific (personnel, physical, location-based or intangible) resources in tailoring procedures and/or routines in connection with this particular cooperation.					
5	Our firm has spent resources on training and development of the supplier's personnel during this collaboration.					
<b>E</b>	<b>Environmental Uncertainty</b>					
1	The availability of alternative suppliers for these products or services is uncertain.					
2	Uncertainty regarding the quality of these products or services is a problem in this market.					
3	The market in which we buy these products or services is complex.					
4	The market supply for these products or services is unstable.					
5	Prices for these products or services are volatile.					
<b>E</b>	<b>Transaction Frequency</b>					
1	The frequency of transactions regarding the procurement of these products or services from the supplier is high.					
2	Compared to other suppliers, the order frequency with this supplier is high.					
<b>F</b>	<b>VRIN Supplier</b>					
1	Given the resources (personnel, physical, location-based or intangible) the supplier possesses and has access to, the supplier is capable of exploiting business opportunities and / or neutralising business threats.					

#	Statement	SD 1	DA 2	N 3	A 4	SA 5
2	Compared to suppliers with similar resources (personnel, physical, location-based or intangible) this supplier has a value-creating strategy not simultaneously implemented by a large number of other suppliers.					
3	We can easily learn the core technology or the way the supplier's service is produced during normal operation.					
4	We can easily learn the supplier's core technology or the way the service is produced by observing their production/creation process.					
5	It would take a long time for us to learn the supplier's core technology or the way the service is produced.					
6	It is easy to copy or imitate the supplier's core technology or the way the service is produced.					
<p>Note: The following questions 24-27 differ from the previous four questions (20-23) only in that they are not about the learnability/imitability but about the substitutability (substitution) of the core technology of the products or the way of producing services.</p>						
7	We can easily substitute our supplier's core technology or the way the service is produced during normal operation.					
8	We can easily substitute our supplier's core technology or the way the service is produced by observing their production/creation process.					
9	It would take a long time to substitute the supplier's core technology or the way the service is produced.					
10	It is easy to substitute or imitate the supplier's core technology or the way the service is produced.					
11	The supplier's specialist know-how is above the industry average.					
12	The supplier's reputation is above the industry average.					

#	Statement	SD 1	DA 2	N 3	A 4	SA 5
13	The supplier's cooperative alliance experience is above the industry average.					
Note: Questions 31-33 correspond in content to the previous 3 questions, but they refer to the supplier's supplier base						
<b>G</b>	<b>VRIN Supplier's Supplier Base</b>					
1	The supplier base of the supplier has specialist know-how that is above the industry average.					
2	The reputation of the supplier base of the supplier is above the industry average.					
3	The supplier base of the supplier has cooperative alliance experience which is above the industry average.					

#	Statement	SD 1	DA 2	N 3	A 4	SA 5
<b>H</b>	<b>Closeness of Competences</b>					
1	The competence of our organisation is close to the competence that the supplier applies in delivering these products or services.					
2	The knowledge we possess in our organisation is comparable to the knowledge the supplier's employees possess in delivering these products or services.					
3	In view of the supplier's competences, our organisation's competences are well suited to produce these products or services.					
4	In view of the supplier's capabilities, our routines and procedures are well suited to produce the supplier's products or services.					

#	Statement	SD 1	DA 2	N 3	A 4	SA 5
<b>I</b>	<b>Backward Integration through Mergers and Acquisitions (M&amp;A)</b>					
1	We are considering taking over the responsibility for creating the supplier's products or services internally by carrying out a merger or acquisition.					
2	It is very likely that our company will create these products or services in the future through a merger or acquisition with the supplier within its own organization.					
3	If demand for these products or services can be expected in the long term, these products or services will be implemented within our own organization through a merger or acquisition with the supplier.					

Thank you for participating in the survey. Please feel free to contact me at any time with questions about the survey:

The overall results of the survey will be sent to you at your request. Please write a short message to the e-mail address given here.

## **Appendix B – German Version of the Questionnaire**

*Patrick Dümpelfeld*  
*The Business School*  
*University of Gloucestershire, Cheltenham*  
*Gloucestershire, GL50 2RH, UK*

Liebe Teilnehmerin, lieber Teilnehmer,

ich bin Doktorand an der Universität von Gloucestershire. Ich möchte Sie um Ihre Hilfe bei meinem Studium bitten, indem Sie den beigefügten Fragebogen zum Thema Supply Chain Management und den Einflussfaktoren für Fusionen und Übernahmen ausfüllen.

Dieser Fragebogen soll Aufschluss darüber geben, wie verschiedene Determinanten der Lieferkette die allgemeine Tendenz eines Unternehmens zur Durchführung von Fusionen und/oder Übernahmen (M&A) beeinflussen.

Das Ausfüllen dieser Umfrage würde nur etwa 7 Minuten dauern. Alle Informationen, die Sie uns zur Verfügung stellen, werden vertraulich und anonym behandelt. Die Gesamtergebnisse der Umfrage werden Ihnen auf Wunsch zugesandt (per E-Mail an die oben genannte Adresse).

Herzlichen Dank für Ihre Teilnahme.

Patrick Dümpelfeld

## GRUNDINFORMATIONEN

**(A) Bitte geben Sie die folgenden Angaben zu Ihrem Beruf an:**

(1) Wie lautet Ihre Berufsbezeichnung? \_\_\_\_\_

(2) In welcher Abteilung sind Sie beschäftigt? \_\_\_\_\_

**(B) Bitte geben Sie die folgenden Informationen zu Ihrer Organisation an:**

(1) Gründungsjahr ihres Unternehmens: \_\_\_\_\_

(2) Anzahl der Beschäftigten in ihrem Unternehmen: \_\_\_\_\_

(3) In welchem Industriezweig ist ihr Unternehmen tätig? \_\_\_\_\_

Bitte beantworten Sie die folgenden Fragen:

C	Eröffnungsfrage
	<p>WICHTIG: Bitte identifizieren Sie einen Lieferanten, mit dem Sie eine Fusion oder Übernahme (M&amp;A) für angemessen halten und behalten diesen im Hinterkopf.</p> <p>Alle nachfolgenden Aussagen in diesem Fragebogen beziehen sich auf den Lieferanten, den Sie identifiziert haben.</p>

**Inwieweit stimmen Sie jeder der folgenden Aussagen zu oder nicht zu? Bitte wählen Sie pro Zeile eine Antwort aus:**

1 = Stimme überhaupt nicht zu (SD) 2 = Stimme nicht zu (DA) 3 = Stimme weder zu noch nicht zu (N) 4 = Stimme zu (A) 5 = Stimme völlig zu (SA)

#	Aussage	SD 1	DA 2	N 3	A 4	SA 5
<b>D</b>	<b>Asset Specificity of Transaction</b>					
1	Mitarbeiter, die die Beziehung mit diesem Lieferanten managen, benötigen hierfür spezifische Fähigkeiten.					
2	In der Zusammenarbeit mit dem Lieferanten mussten/müssen wir einige Aspekte des Betriebsablaufs des Lieferanten kennenlernen.					

#	Aussage	SD 1	DA 2	N 3	A 4	SA 5
3	Unsere Unternehmen hat viel Zeit damit verbracht/verbringt viel Zeit damit, sich Wissen über die technischen oder dienstleistungsbezogenen Standards des Lieferanten anzueignen.					
4	Unser Unternehmen hat spezifische (personelle, physische, standortbezogene oder immaterielle) Ressourcen eingesetzt, um eigene Verfahren und/oder Routinen im Rahmen der Zusammenarbeit mit diesem Lieferanten anzupassen.					
5	Unsere Firma hat während dieser Zusammenarbeit Ressourcen für die Schulung und/oder Entwicklung des Personals des Lieferanten aufgewendet..					
<b>E</b>	<b>Environmental Uncertainty</b>					
1	Die Verfügbarkeit alternativer Lieferanten für die bei diesem Lieferanten bezogenen Produkte oder Dienstleistungen ist unsicher.					
2	Die Unsicherheit bezüglich der Qualität dieser Produkte oder Dienstleistungen ist ein Problem in diesem Markt.					
3	Der Markt, in dem wir diese Produkte oder Dienstleistungen kaufen, ist komplex.					
4	Das Marktangebot für diese Produkte oder Dienstleistungen ist instabil.					
5	Die Preise für diese Produkte oder Dienstleistungen sind volatil.					
<b>E</b>	<b>Transaction Frequency</b>					
1	Die Häufigkeit der Transaktionen hinsichtlich der Beschaffung dieser Produkte oder Dienstleistungen bei dem Lieferanten ist hoch.					
2	Im Vergleich zu anderen Anbietern ist die Auftragsfrequenz bei diesem Lieferanten hoch.					



<b>F VRIN Supplier</b>						
<b>#</b>	<b>Aussage</b>	<b>SD 1</b>	<b>DA 2</b>	<b>N 3</b>	<b>A 4</b>	<b>SA 5</b>
1	Angesichts der (physischen, personellen oder organisatorischen) Ressourcen, über die der Anbieter verfügt bzw. zu denen er Zugang hat, ist er in der Lage Geschäftsmöglichkeiten zu nutzen und/oder Geschäftsrisiken zu neutralisieren.					
2	Im Vergleich zu Lieferanten mit ähnlichen (physischen, personellen oder organisatorischen) Ressourcen verfügt dieser Lieferant über eine Wertschöpfungsstrategie, die nicht gleichzeitig auch von einer großen Anzahl anderer Lieferanten umgesetzt wird.					
3	Wir können die Kerntechnologie der Produkte bzw. die Art und Weise, wie die Dienstleistung des Lieferanten erstellt wird, während unseres normalen Betriebs leicht erlernen.					
4	Wir können die Kerntechnologie dieser Produkte bzw. die Art und Weise, wie die Dienstleistung erstellt wird, leicht erlernen, wenn wir den Produktions-/Entstehungsprozess beobachten würden.					
5	Es würde lange dauern, die Kerntechnologie der Produkte des Lieferanten bzw. die Art und Weise, wie die Dienstleistung erstellt wird, zu erlernen.					
6	Es ist einfach, die Kerntechnologie der Produkte des Lieferanten bzw. die Art und Weise, wie die Dienstleistung erstellt wird, zu kopieren oder nachzuahmen.					
<p>Hinweis: Die folgenden Fragen 24-27 unterscheiden sich von den vorhergehenden vier Fragen (20-23) nur insofern, als dass es hierbei nicht um die Erlernbarkeit/ Imitierbarkeit sondern um die Ersetzbarkeit (Substitution) der Kerntechnologie der Produkte bzw. der Art und Weise der Dienstleistungserstellung geht.</p>						

#	Aussage	SD 1	DA 2	N 3	A 4	SA 5
7	Wir können die Kerntechnologie der Produkte dieses Lieferanten bzw. die Art und Weise, wie die Dienstleistung erstellt wird, während unseres normalen Betriebs leicht substituieren.					
8	Wir können die Kerntechnologie der Produkte des Lieferanten bzw. die Art und Weise, wie die Dienstleistung erstellt wird, leicht substituieren, wenn wir den Produktions-/Entstehungsprozess des Lieferanten beobachten würden.					
9	Es würde lange dauern, die Kerntechnologie der Produkte des Lieferanten bzw. die Art und Weise wie die Dienstleistung erstellt wird, zu substituieren.					
10	Es ist einfach, die Kerntechnologie der Produkte des Lieferanten bzw. die Art und Weise, wie die Dienstleistung erstellt wird, zu substituieren					
11	Das fachliche Know-how des Lieferanten liegt über dem Branchendurchschnitt.					
12	Die Reputation des Lieferanten liegt über dem Branchendurchschnitt					
13	Die Erfahrung des Lieferanten mit kooperativen Allianzen liegt über dem Branchendurchschnitt.					

Hinweis: Die Fragen 31-33 entsprechen inhaltlich den vorherigen 3 Fragen, beziehen sich aber auf den Lieferantenstamm des Lieferanten

<b>G</b>	<b>VRIN Supplier's Supplier Base</b>					
<b>#</b>	<b>Aussage</b>	<b>SD 1</b>	<b>DA 2</b>	<b>N 3</b>	<b>A 4</b>	<b>SA 5</b>
1	Die Lieferantenbasis des Lieferanten verfügt über ein fachliches Know-how, das über dem Branchendurchschnitt liegt.					
2	Die Reputation der Lieferantenbasis des Lieferanten liegt über dem Branchendurchschnitt.					
3	Der Lieferantenstamm des Lieferanten verfügt über Erfahrungen mit kooperativen Allianzen, die über dem Branchendurchschnitt liegen.					

<b>#</b>	<b>Aussage</b>	<b>SD 1</b>	<b>DA 2</b>	<b>N 3</b>	<b>A 4</b>	<b>SA 5</b>
<b>H</b>	<b>Closeness of Competences</b>					
1	Die Kompetenzen unserer Organisation liegen nahe an den Kompetenzen des Lieferanten, welche dieser hinsichtlich der Erstellung dieser Produkte oder Dienstleistungen anwendet.					
2	Das Wissen, das wir in unserer Organisation besitzen, ist vergleichbar mit dem Wissen, das die Mitarbeiter des Lieferanten besitzen.					
3	Im Hinblick auf die Kompetenzen des Lieferanten sind auch die Kompetenzen unserer Organisation grundsätzlich gut geeignet, diese Produkte oder Dienstleistungen erstellen zu können.					
4	In Anbetracht der Fähigkeiten des Lieferanten sind auch unsere Routinen und Verfahren grundsätzlich gut geeignet, die Produkte oder Dienstleistungen des Lieferanten erstellen zu können.					

#	Aussage	SD 1	DA 2	N 3	A 4	SA 5
<b>I</b>	<b>Backward Integration through Mergers and Acquisitions (M&amp;A)</b>					
1	Wir erwägen, die Verantwortung für die Erstellung der Produkte oder Dienstleistungen des Lieferanten durch die Durchführung einer Fusion oder Übernahme intern zu übernehmen.					
2	Wenn ein langfristiger Bedarf für diese Produkte oder Dienstleistungen absehbar ist, werden diese Produkte oder Dienstleistungen des Lieferanten innerhalb unserer eigenen Organisation durch eine Fusion oder Übernahme erstellt.					
3	Es ist sehr wahrscheinlich, dass unser Unternehmen diese Produkte oder Dienstleistungen in Zukunft durch eine Fusion oder Übernahme mit dem Lieferanten innerhalb der eigenen Organisation erstellen wird.					

Vielen Dank für Ihre Teilnahme an der Umfrage. Bitte wenden Sie sich bei Fragen zur Umfrage gerne jederzeit an:

Die Gesamtergebnisse der Umfrage werden Ihnen auf Ihren Wunsch hin zugesandt. Bitte schreiben Sie eine kurze Nachricht an die hier angegebene E-Mail-Adresse.