

**Master's Programme in Accounting**

# **Leveraging Scenario Analysis for Enhanced Decision-making in Mergers and Acquisitions**

A constructive case study of a Nordic company

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### **Abstract**

The objective of this thesis is to map the possibilities for leveraging scenario analysis for enhanced strategic investment decision-making (SIDM) in mergers and acquisitions. Scenario analysis is rooted in US military-strategic thinking, and it has been used by governments and organizations since WWII to help detect potential discontinuities and design robust strategies and contingency plans for different futures. Over the last decades, the use of scenarios has become more popular in regular companies, and various scenario typologies and techniques have been presented for pragmatic use. Many companies have started to use the “traditional” scenario analysis technique initiated by Royal Shell and GE to develop their long-run strategy, while some companies seek scenario benefits from ad hoc analyses that generate information to explicitly articulated decision-making contexts. In managerial accounting, scenario analysis can be of particular use amidst uncertainty and demanding SIDM contexts that require more than simple NPV calculations and sensitivity analyses.

This thesis demonstrates how a combination of predictive and explorative scenario typologies can serve as a reasonable starting point for companies looking to enrich the information available for investment decision-makers, given that adequate consideration is given to the characteristics that separate scenarios from other investment risk evaluation techniques, such as sensitivity analysis. The thesis is conducted as a single case study with a constructive approach subject to a weak market test. The pragmatic objective of the study is to design a scenario analysis process flow for a large Nordic company operating in the social and healthcare industry and which actively engages in M&A opportunities to achieve its growth targets. In the company, scenarios have hitherto been utilized in an ad hoc manner with emphasis on quantified information, and the main requirement for the construction established in this thesis is to systematize the scenario process flow while integrating some qualitative elements as well. The empirical data for this thesis was collected through five semi-structured interviews with company executives and managers, supported by documentation of prior M&A opportunity evaluations and scenarios.

This thesis contributes to both pragmatic and academic domains in managerial accounting. As a constructive case study, this thesis provides the case company with a scenario analysis process flow designed for M&A in accordance with the unique requirements, concerns, and challenges identified in the company during the data collection phase. Academically, the thesis contributes to the SIDM literature by integrating insights from accounting research and futurology to examine the power of scenario analysis in investment appraisal and risk evaluation alongside other, more traditional accounting techniques.

**Keywords** scenario analysis, investment appraisal, risk analysis, mergers and acquisitions, strategic investment decision-making

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**Työn nimi** Skenaarioanalyysin hyödyntäminen yrityskauppoja koskevassa investointipäätöksenteossa - konstruktiiivinen tapaustutkielma pohjoismaisesta yrityksestä

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### **Tiivistelmä**

Tämän tutkielman tavoitteena on kartoittaa mahdollisuuksia hyödyntää skenaarioanalyysiä yrityskauppoja koskevien, strategisten investointipäätösten parantamiseksi. Skenaarioanalyysi pohjautuu yhdysvaltalaiseen sotilasstrategiseen ajatteluun, ja sitä on historiallisesti hyödynnetty hallinnoissa ja organisaatioissa osana muutosten ja uhkakuvien havainnointia sekä strategista suunnittelua. Viime vuosikymmeninä skenaarioiden käyttö on yleistynyt tavallisissa yrityksissä, ja erilaisia skenaariotyyppejä ja -tekniikoita on esitetty soveltuviksi käytännön tilanteisiin. Monet yritykset ovat omaksuneet edelläkävijäyritysten kehittämän "perinteisen" menetelmän osaksi pitkän aikavälin strategista suunnittelua, kun taas toiset yritykset hakevat skenaariosta hyötyjä yksittäisiä investointeja koskevassa päätöksenteossa. Liikkeenjohdon päätöksentekoa tukevassa laskennassa skenaarioanalyysi voi olla erityisen hyödyllinen menetelmä epävarmoissa ja vaativissa päätöksentekotilanteissa, jotka edellyttävät muutakin kuin yksinkertaisia nettoykyarvolaskelmia ja herkkyysanalyysiä.

Tämä tutkielma osoittaa, kuinka yhdistelmä ennakoivaa ja tutkivaa skenaarioanalyysiä voi tarjota yritykselle lähtökohdan täydentää investointipäätöksentekijöiden käytettävissä olevaa tietoa skenaarioiden avulla; korostaen skenaarioanalyysimenetelmän erityispiirteitä verrattuna muihin riskiarvioinnin menetelmiin, kuten herkkyysanalyysiin. Tutkielma on toteutettu tapaustutkielmana soveltaen konstruktiiivista lähestymistapaa, ja sen käytännön tavoitteena on laatia skenaarioanalyysiprosessi suurelle pohjoismaiselle sosiaali- ja terveydenhuoltoalan yritykselle, joka osallistuu aktiivisesti yrityskauppoihin saavuttaakseen kasvutavoitteensa. Yrityksessä on aiemmin käytetty skenaarioita ad hoc -tyyppisesti painottaen kvantitatiivista tietoa, ja konstruktion on määrä systematisoida analyysin prosessivaiheita tuoden siihen lisäksi laadullisia elementtejä. Empiirinen materiaali on kerätty puolistrukturoiduin haastatteluin yrityksen johdon ja yrityskauppojen sekä laskennan asiantuntijoiden kanssa, ja havaintoja on täydennetty yrityksen tutkielmaa varten luovuttamalla yrityskauppadokumentaatiolla.

Tutkielman kontribuutio linkittyy sekä käytännön yritysmaailmaan että akateemisiin laskentatoimen alueisiin. Konstruktiiivisen tutkimusmenetelmän mukaisesti tutkielman lopputuloksena on kohdeyritykselle suunniteltu ja yrityskauppoihin sovellettavaksi tarkoitettu skenaarioanalyysiprosessi, jonka laadinnassa on huomioitu tiedonkeruun aikana yrityksessä esiin nousseiden haasteiden ja vaatimusten raamit. Akateemisesti tutkielma pyrkii integroimaan laskennan ja futurologian näkemyksiä ja viemään näitä strategisia investointipäätöksiä koskevan kirjallisuuden viitekehukseen. Tässä kehikossa tutkielma syventyy skenaarioanalyysin potentiaaliin investointien ja niiden riskien arvioinnissa perinteisempien laskentamenetelmien rinnalla.

**Avainsanat** skenaarioanalyysi, investointien arviointi, riskianalyysi, yrityskaupat, strateginen investointipäätöksenteko

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## Abbreviations

CIA	cross-impact analysis
CRA	constructive research approach
DCF	discounted cash-flow
M&A	merges and acquisitions
MA	Morphological Analysis
NPV	net present value
SID	strategic investment decision
SIDM	strategic investment decision-making
TIA	trend impact analysis

## Contents

Abbreviations .....	5
1. INTRODUCTION .....	8
1.1 Motivation .....	8
1.2 Research objectives, methodology, and contribution .....	10
1.3 Structure of the thesis .....	11
2. LITERATURE REVIEW .....	13
2.1 Strategic investment decision-making .....	13
2.1.1. Investment appraisal techniques .....	14
2.1.2. Risk, uncertainty, and predictability in SIDM .....	16
2.1.3. Risk evaluation in SIDM .....	19
2.2 Mergers and acquisitions .....	22
2.2.1. M&A as strategic investments .....	22
2.2.2. Unique characteristics of M&A investments .....	24
2.2.3. Synergy rationales for M&A .....	25
2.2.4. The art of valuation .....	28
2.3 Scenario analysis .....	30
2.3.1. Scenarios in a nutshell .....	30
2.3.2. Three future perceptions .....	31
2.3.3. Three scenario typologies .....	32
2.3.4. Five-phase process for scenario analysis .....	36
2.3.5. Practical scenario techniques .....	43
2.4 Synthesis of the literature review .....	54
3. METHODOLOGY .....	57
3.1 Research methodology and data collection .....	57
3.2 Critical overview of CRA .....	59
3.3 Generalizability, reliability, and validity .....	63
4. EMPIRICAL FINDINGS .....	68
4.1 Introduction to the case study setting .....	68
4.2 The company's M&A rationales .....	70
4.3 Target and risk evaluation .....	73
4.4 Future perceptions of key personnel .....	75
4.5 Scenario analysis .....	77

4.5.1.	Elements in the current use of scenarios .....	77
4.5.2.	Challenges in the current process .....	79
4.5.3.	Scenario analysis process design .....	81
4.5.4.	Summary of empirical findings.....	97
5.	THE DESIGNED CONSTRUCTION.....	99
5.1.	General objectives and commentary .....	99
5.2.	Description of the process flow .....	100
5.2.1.	Scenario field identification.....	100
5.2.2.	Key factor identification.....	102
5.2.3.	Key factor analysis .....	104
5.2.4.	Scenario generation .....	105
5.2.5.	Scenario learning .....	106
5.2.6.	Considerations for practical implementation.....	108
5.2.7.	The company's approval of the construction .....	110
6.	DISCUSSION AND CONCLUSIONS .....	111
6.1.	Research summary .....	111
6.2.	Managerial insights .....	113
6.2.1.	Value in scenario analysis .....	114
6.2.2.	Challenges in scenario analysis.....	116
6.3.	Considerations and limitations .....	117
6.4.	Suggestions on future research avenues .....	118
	BIBLIOGRAPHY .....	120
	APPENDIX .....	126

# 1. INTRODUCTION

*He who sees the past as surprise free is bound to have a future full of surprises. — Amos Tversky*

## 1.1 Motivation

Contemporary business landscape is increasingly stigmatized by rapid movement and uncertainty, and decision-makers must cope with a plethora of risks while choosing the right paths for their organizations. In 2024, the major external threats are particularly related to topics around climate change, artificial intelligence, societal and political polarization, cost-of-living crisis, and cyberattacks (World Economic Forum, 2024). Under these circumstances, decision-makers' willingness to look outside the box to creatively explore alternative future paths can become a significant advantage for companies in their attempt to adapt to changes and build robust strategies. This has provoked companies to seek for new analytical methods to help make sense of the future.

During the last century, many governments and organizations have begun to use scenario analysis as a remedy to combat the uncertainties they must deal with (Cairns & Wright, 2017). Historically, the concept of scenario originates from the US military-strategic thinking particularly prevalent during World War II (Steinmüller, 2018), and it refers to a description of alternative possible future states and the paths of development which may lead to the explicitly articulated states (Börjeson et al., 2006; Kosow and Gaßner, 2008). Scenario analysis can present beneficial for organizations particularly through its power to redirect attention to potential contingencies and discontinuities in the environment, and it has been argued to be a valid method for harnessing the creative side of the human mind (Morrison and Wilson, 1997).

In general, business organizations have been suggested to benefit from a shift from traditional, forecast-based approaches to strategic investment decision-making (SIDM) to more comprehensive approaches including emergent analytical tools (Alkaraan and Northcott, 2006), such as scenario analysis which explicitly allows for qualitative considerations as well (see e.g., Mietzne and Reger, 2005). Planning with the help of



scenarios has been argued to increase companies' abilities to both identify unfolding opportunities and defend themselves against risks in disruptive circumstances (Courtney et al., 2013). To the surprise of some, over-reliance on traditional investment appraisal techniques based on discounted cash flows (DCF) still appears to persist within companies, and other methods available remain frequently overlooked (Courtney et al., 2013).

According to Courtney et al. (2013), broadening the analytical toolkit for SIDM could be beneficial especially in high-velocity business environments as strategic investment decisions (SIDs) are painted by various operational, financial, and strategic risks decision-makers must cope with (Alkaraan and Northcott, 2006), and incorrect assumptions made in quantitative investment appraisal may lead to errors in forecasting and ultimately drive poor investment decisions hindering financial performance (Baker and English, 2011). After all, sound SIDs are at the core of companies' abilities to achieve their long-term strategic targets and protect their competitive positions against fierce market competition (Slagmulder,

Particularly investment decisions related to mergers and acquisitions (M&A) can hold significant strategic risks (Alkaraan and Northcott, 2006) as M&A are frequently driven by complex patterns of different motives related to both financial and non-financial aspects (e.g., Trautwein, 1990). In the context of M&A, mere valuation of future cash flows may mislead decision-makers as it may neglect the evaluation of overall strategic fit, which is often difficult to quantitatively value using traditional techniques (Ross et al., 2008). Importantly, the failure rate for M&A has been denoted as significant (Christensen et al., 2011); albeit various definitions of "failure" most certainly exist. Generally, measuring the level of either success or failure in M&A is not straightforward because of the ambiguity and difficulty associated with ex-post evaluation, particularly in terms of quantifying the realized post-merger benefits. Importantly, while M&A often entail high levels of risk, it can simultaneously offer companies a gateway to achieve their growth targets without costly R&D initiatives or greenfield investment (Piesse et al., 2022; Snow, 2023). Consequently, a bundle of different rationales and incentives to pursue M&A opportunities exist and frequently override the considerations given to the risks and uncertainties associated with the transactions.

Knotting together the strategic and financial remarkability of M&A decisions and the difficulty associated with evaluating their actual outcomes, one can easily understand how considering alternative scenarios for potential deal outcomes can be advantageous for companies that participate in M&A. This is where the methods of scenario analysis can become helpful. Even though scenario analysis has traditionally been used mostly for examining the environment through a wider lens and with little attempt to arrive at predictions, many of its underlying ideas and methodologies can be harnessed for specific decision-making contexts with predictive elements as well. In the domain of M&A, scenario analysis can be used for identifying and evaluating both positive and negative risks and the most critical uncertainties linked to specific acquisitions targets prior to decision-making. Nonetheless, research particularly regarding the process of formulating the scenarios in practice remains underdeveloped (Bowman et al., 2013), and more research effort is required to broaden the knowledge we currently have of the usability of scenarios in real life.

## **1.2 Research objectives, methodology, and contribution**

The objective of this thesis is to map the possibilities for leveraging scenario analysis for enhanced SIDM in M&A. Conducted as a qualitative single-case study with a constructive research approach (CRA), the thesis builds on a pragmatic objective to design a scenario analysis process flow ('the construction') that can be implemented into a real-life context to improve the case company's ability to make well informed M&A decisions.

The case company in this study is a large Nordic company operating in the social and health care industry, currently faced with industry-specific changes that must be addressed. The company was chosen for this thesis based on research interest and alignment between the research objectives in this thesis and the company's current requirements. Notably, the company's growth is strongly driven by its active engagement in the M&A market, and the company is therefore continuously monitoring, evaluating, and pursuing new acquisition targets. This served as the main justification for choosing M&A as the more specific scope for this thesis.

Currently, the company already has experience of using some scenario analysis techniques in their SIDM, but the process is considered as underdeveloped and rather “unfolding”, and the scenarios seem to be strongly characterized by a mere predictive tone (“what-if”) instead of well distinguishable futures. Within the company, this has led to an identified need for a more systematized scenario process flow; systematization of the process is expected to enhance the company’s SIDM particularly through clarified responsibilities and more seamless cross-functional interaction throughout the whole process.

Data collection for the thesis involved five semi-structured, in-depth interviews with relevant company executives and managers. The people chosen for interviews are all involved in the M&A process, either as decision-makers or as contributors to investment appraisal. For enhanced data triangulation, other internally provided materials, such as documentation of previous M&A investment proposals presented to decision-makers, were used as research data as well. This enabled building a more comprehensive view of the company’s current policies for M&A evaluation, SIDM procedures, and current practice to use scenario analysis as an analytical tool.

The theoretical and practical contributions of this thesis are twofold. First, as a constructive single-case study, the thesis contributes to the pragmatic domain by providing the company with a scenario analysis process flow for M&A in accordance with the unique requirements, concerns, and challenges that were identified during the interviews (see section 4 on empirical findings). Secondly, the thesis contributes to SIDM literature by drawing insights from both managerial accounting research and futures studies to examine how scenario analysis could serve as a valid addition to the investment appraisal toolkit used in companies; touching upon a theme highly relevant for the research field of managerial accounting.

### **1.3 Structure of the thesis**

The thesis unfolds as follows. The next section consists of a literature review covering subsections related to SIDM, M&A as strategic investments, and scenario analysis. In the literature review, the key concepts and categorizations, theoretical insights, and techniques

essential for designing the construction are discussed. From the reader's perspective, the review aims at providing answers to by whom, why, and how scenario analysis can be leveraged to steer companies through uncertainties. In the third section, the chosen research methodology and the data collection for this thesis are described in more detail. Also, critical evaluation of the generalizability, reliability, and validity of the methodology is provided both on a general level and in the specific context of this thesis.

After having covered the research methodology, the empirical findings from the data collection phase are showcased. The interviews are described and analyzed in a narrative manner, with the inclusion of insightful extracts from the actual interviews. Importantly, the fourth section forms the basis for the choices made in designing the construction. The construction is presented in the following section, which includes a detailed description of the construction itself and justifications for the elements included in it. Finally, in the last section, all the previous insights are summarized, and the contributions and limitations of this thesis are addressed while reflecting on potential future research agenda regarding the research topic. Also, some general managerial implications are suggested as a contribution to the “in-between” intersecting the SIDM literature and companies’ pragmatic needs for more comprehensive decision-making tools under uncertain times.

## **2. LITERATURE REVIEW**

### **2.1. Strategic investment decision-making**

Strategic investment decision-making (SIDM) can be defined as a process that involves decisions concerning substantial investments that embed high levels of risk, often deliver ambiguous or hardly quantifiable results, and significantly impact the long-term performance of economic entities (Alkaraan and Northcott, 2006). In literature, rationales for strategic investments have been roughly categorized to strategic and financial rationales, which should often be considered together because of their strong interconnectedness; appropriate strategic justification is usually a prerequisite for proper financial rationalization to exist (Grant & Nilsson, 2020).

Particularly investments with strategic rationales are crucial for organizations' abilities to achieve their long-term strategic targets, and to maintain and enhance their competitive positions in competitive market environments (Slagmulder, 1997). As described by Harris et al., (2016), an organization's strategy "both shapes and is shaped by its investments in capital assets", which positions SIDM at the heart of economic organizations' strategic, financial, and operational planning and performance. To provide a few examples, strategic investments can be pursued through completely new or expansions into existing production lines, applications of new technologies, or through M&A (Slagmulder, 1997; Alkaraan & Northcott, 2006).

Overall, SIDM is linked to a wider capital budgeting process in organizations, during which practitioners plan, analyze, select, and manage investments into assets that generate cash flows for several years ahead. The capital budgeting process can be divided into six consecutive phases as follows: (1) identification of proposals, (2) estimation of cash flows, (3) evaluation phase, (4) selection phase, (5) implementation phase, and (6) post completion auditing (Baker and English, 2011, p. 2). Although each phase of the process is important for successful strategic investments, the phase for estimating cash flows is often perceived as the most challenging due to the inherent uncertainty related to cash flow forecasts and the assumptions they are drawn upon. During the estimation phase, practitioners prepare

forecasts of cash flows and other variables required for analysis, such as the cost of capital, and forecasting errors occur frequently (Baker and English, 2011, p. 2). Importantly, incorrect assumptions for key variables and general forecasts as part of investment appraisal might lead to poor investment decisions. Consequently, there is a strong need for techniques that better account for uncertainties and help decision-makers identify and balance the risks and opportunities associated with strategic investments as part of the SIDM process.

### **2.1.1. Investment appraisal techniques**

In SIDM, practitioners use different quantitative and qualitative investment appraisal techniques to evaluate investment alternatives, and the outputs are used by decision-makers to justify vital decisions. Some of the traditionally favored quantitative investment appraisal techniques include the net present value (NPV), accounting/internal rate of return (A-/IRR), hurdle rates, and payback time (PB) (Moore and Reichert, 1983; Graham and Harvey, 1999; Alkaraan and Northcott, 2006). In addition to these techniques, practitioners may use benchmarking, multiples, sensitivity analysis, and computer-based simulations (e.g., Monte Carlo simulation) to form a more comprehensive understanding of the investment's possible and plausible outcomes. Alkaraan and Nortcott (2006) find that NPV is being used most frequently for both strategic and non-strategic investments. Interestingly, even in decision-making contexts characterized by very high uncertainty and long stage-gate investment processes, such as the pharmaceutical industry, NPV has been shown to serve as a trusted and persistent technique to conduct investment appraisal – even to an extent higher than the average use in business organizations (Huikku and Kolehmainen, 2023).

Given the popularity of the traditional financial appraisal techniques, Courtney et al. (2013) argue that the toolkit used for justifying SIDs remains too narrow in many companies. Especially in highly uncertain and complex environments, traditional methods based on simple DCF analysis, such as the NPV, may not provide reliable enough information - as mentioned earlier, uncertainty in the assumptions made for cash flow forecasts can quickly undermine their sensibleness. Even in more stable industries, uncertainties and complexities are facing an upward trend as we encounter fundamental challenges related to, e.g., climate change, global pandemics, wars and political tensions, and demographic bifurcations (World Economic Forum, 2024). Hence, considering the use of a wider variety of

analytical tools may be reasonable for companies.

Scenario-based planning has been suggested to assist companies in both identifying unfolding opportunities and defending themselves against risks in disruptive circumstances (Courtney et al., 2013). Surprisingly, despite the availability of additional analytical tools, over-reliance on DCF analysis appears to persist within business organizations and other methods remain frequently overlooked (Courtney et al., 2013). Some of the reasons behind this may be traced back to resource scarcity and lack of required expertise to implement more “advanced” or novel tools.

Interestingly, more recent developments in SIDM literature have acknowledged the role of decision-makers’ own agency, intuition, and personal expertise in SIDM (Emmanuel et al., 2010; Elmassri et al., 2016; Grant & Nilsson, 2020). Moreover, Grant & Nilsson (2020) point out that the process for evaluating synergies arising from acquisitions are largely based on subjective judgments based on the evaluators’ or decision-makers’ intuition. Aligned with this, Alkaraan and Northcott (2006) argue judgments and intuitive thinking patterns significantly sculpt the perceived linkages between strategic and financial rationales for investments. Naturally, some judgments are always present in making predictions even in the simplest DCF or payback time models; the base variables for each calculation must somehow be determined, and humans are often involved in their determination.

Despite a pile of research indicating unreasonably persistent reliance on traditional financial appraisal tools, some evidence of instances in which qualitative analysis might serve as a primary decision-making tool has been encountered as well. For example, Elmassri et al. (2016) find how extreme externally imposed uncertainty may adversely impact the usability of financial appraisal techniques. Moreover, the scholars establish that significant political, social, and economic uncertainties hinder the usability of financial appraisal techniques, which naturally leads to more emphasis given to non-financial considerations.

However, contradicting views have been presented, arguing that decision-making in high-velocity and uncertain conditions may require higher procedural rationality (see e.g., Bourgeois and Eisenhardt, 1988), which would again lead to the requirement of more

comprehensive and sophisticated financial analysis of an investment. Unsurprisingly, this perception has been criticized as unrealistic particularly in terms of an organization's ability to collect and process large amounts of information in rapidly evolving environments (Bourgeois and

Eisenhardt, 1988), and the argument also appears to conflict with Elmassri et al. (2016) findings about the lower usability of financial analysis tools under extreme uncertainty. A more justified assumption could be that SIDM in high-velocity environments and/or in pressured contexts mostly consists of the decision-makers' intuitive processing; the process being faster, automatic, associative, unconscious, and based on implicit knowledge stored in one's memory in contrast to the more rational, reflective thinking process (Kahneman, 2011; Grant & Nilsson, 2020). Moreover, under rapidly changing conditions, any requirement for more sophisticated financial analysis appears unreasonable as the information used and the assumptions made for the analysis will likely be quickly outdated.

In the next section, the concepts of uncertainty and risk within the SIDM context are discussed in more detail. The more conceptual subsection is followed by a more pragmatic one (2.1.4.), delving into some of the commonly used risk evaluation approaches prominent in accounting literature.

### **2.1.2. Risk, uncertainty, and predictability in SIDM**

Risk and uncertainty are concepts that are frequently present and often interchangeably used in SIDM literature (Alessandri et al., 2004). Overall, the literature has over the past decades evolved from heavy technical orientation to a more conceptual focus, which has caused an increased flow of attention to investment risk evaluation as well (Harris, 1999). Furthermore, it has been acknowledged that making sound SIDs requires decision-makers' ability to identify the major risks and uncertainties related to each investment, assess their respective impact and likelihood, and design alternative contingency plans for potential risk realization (Alessandri et al., 2004); otherwise, investment decisions may result sub-optimal and deter firm performance.



Despite the synonymic use of the concepts risk and uncertainty, a distinction between the concepts should be made for conceptual clarity - the distinction becomes essential for one to understand how risk and uncertainty can be assessed, how they behave, and what their impact on SIDs may be. For this thesis, the concepts are distinguished as follows. Risk arises from the variance in potential outcomes of specific variables, and it can be defined as the “probability distribution of the consequences of each alternative” (March and Simon, 1958, p. 137). For example, one may determine a baseline for forecasted revenues based on two variables (price and quantity), and the risk associated with these variables can be measured as the variance of the variables’ potential outcomes.

On the other hand, uncertainty is less straightforward to be modeled quantitatively. Uncertainty refers to when the “consequences of each alternative belong to some subset of all possible consequences, but the decision maker cannot assign definite probabilities to the occurrence of particular outcomes” (March and Simon, 1958, p. 137). Building on the rather abstract definitions of risk and uncertainty, it can be argued that common risk assessment techniques, such as sensitivity analysis or Monte Carlo simulations, can serve to describe the basic risk profiles of investments; without explicitly addressing their uncertainties. Moreover, Schoemaker (2004, p. 275) illustratively refers to uncertainty as “disagreement among forecasters, or doubts within a single forecaster, as to the correct value of an unknown quantity of interest.” Simply put, risk is something that may be realized, and uncertainty just exists.

To ease the abstraction of prior definitions of risk and uncertainty, another perception of them is described in the following. Makridakis et al. (2009) illustrate the concept of uncertainty by distinguishing between subway uncertainty and coconut uncertainty. Subway uncertainty is used to describe uncertainty that can be approached using statistics; thereby entailing properties of risk. For example, the arrival time of the next subway at the station can be forecasted quite well based on prior observations, and it can therefore be incorporated in probabilistic calculations based on clear assumptions about, e.g., a normal distribution for the outcome as well as normally distributed forecasting errors. Consequently, system structures subject to subway uncertainty can generally be quite accurately predicted using probabilistic calculations given that continuity between the past and the future exists.

Extending the revenue example from the prior definitions, revenue forecasts can be computed using statistical models based on historical observations of sales volumes and prices.

On the contrary, coconut uncertainty is used to describe events that cannot be predicted using statistics, such as the event of a coconut falling off onto someone's head from a palm tree (Makridakis et al., 2009). Furthermore, coconut uncertainty describes rare, unique, and surprising outlier events hard to anticipate and which may lie completely outside the scope of our imagination; events also referred to as "Black Swans" (Taleb, 2007). In recent years, an increasing number of Black Swan events have been witnessed globally, such as the outbreak of the global Covid-19 pandemic and the War of Ukraine. Consequently, companies have faced unforeseen challenges, such as problems in their supply chains and pressures to withdraw from certain market areas. It is easy to understand how this underlines the need for companies to develop their ways to analyze and evaluate the uncertainties and risks that exist.

In general, it can be stated that humans' ability to predict future outcomes for different phenomena or system developments depends much on the complexity of the system; that is, the forces driving the key variables, and the sources of uncertainty the system itself depends on (Savvides, 1994). Savvides (1994) argues that some future scenarios are easier to forecast because of the abundance in prior observations available, such as the time of sunset in a specific part of the world on a given day. Time series analysis can be used to forecast such phenomena, and the results can be considered relatively reliable. In contrast, more complex phenomena with dependencies between and among various internal and external factors may be impossible to reliably and accurately predict.

Certain limitations to human cognition may also undermine our ability to predict events and cope with uncertainty. Cognitive bias can severely cloud human judgment and impact the perceptions we take on risk and uncertainty, and possibly distort subjective evaluations made of historical and/or future events. Particularly perceptions of risk and uncertainty can be significantly distorted by the rather selective information available for daily consumption; humans again tend to cognitively overweigh events that frequently appear in

the newspapers and under-evaluate the occurrence of events that are less reported on (Schoemaker, 2004). In addition, Schoemaker (2004) argues that humans are inclined to dread most risks that are either not well understood, occur in clusters, or which cannot be controlled by actions (Schoemaker, 2004). A plane crash while flying on a commercial airplane serves as an example of an uncontrolled risk that occurs in clusters. On the other hand, illusion of control is one of the major cognitive biases which may essentially lead to over-confidence in dealing with uncertainty. It has even been shown that higher effort put into predicting the future tends to increase the experience of having control (Langer, 1975); undoubtedly a phenomenon prevalent in SIDM as well.

Overall, in business contexts, low predictability is particularly frequent in high-velocity environments where information is continuously questionable in terms of its accuracy and timeliness (Bourgeois and Eisenhardt, 1988). It can be argued that this applies to almost any business organization in today's markets. Within the context of SIDM and investment risk evaluation particularly, Shapiro (2005, p. 110) illustratively summarizes the dilemma encountered by practitioners dealing with investment evaluation and poor future predictability: *"Managers responsible for evaluating capital expenditure proposals should pray for the best but prepare for the worst."*

### **2.1.3. Risk evaluation in SIDM**

Strategic investments require major financial and non-financial resource commitments, and future uncertainty makes them vulnerable to risks. As previously acknowledged, strategic investments tend to have long-term impact on firm strategy (Alkaraan and Northcott, 2006) and a long time horizon is usually used in their evaluation, increasing the uncertainty associated with investment returns as events further in the future are generally less predictable than nearby events.

Aligned with the conceptual definition of risk (March and Simon, 1958), investment risk is often measured as the variability of expected investment returns (Shapiro, 2005, p. 110). Generally, it can be measured on three different levels. First, risk can be measured as the total investment risk based on the expected variability in the investment's returns. Measured at this level, practitioners gain specific insights into how an investment may behave solely;

that is, irrespective of other investment decisions. Second, risk can be measured at company level, reflecting the variability of the investment against the variability attributed to the company's total returns. Through this, practitioners may assess the contribution of an investment to the company's investment portfolio and overall risk profile. Lastly, investment risk can be measured as the extent of systematic risk, which is determined based on the investment's beta. Beta can be measured as the correlation between investment returns and returns of a market portfolio. In the scope of this thesis, investment risk will be considered in accordance with the first option; measured at investment-level without additional consideration given to other investments.

Various approaches to risk evaluation have been examined in SIDM literature. Alkaraan and Northcott (2006) find sensitivity and scenario analyses as the most widely used techniques for mapping risks for both strategic and non-strategic investments. This may be due to their perceived simplicity and intuitive appeal. In the simplest form of sensitivity analysis, one of the key variables is changed and the investment outcome is observed to see how sensitive the outcome is for key assumptions. Hence, by using sensitivity analysis, practitioners can identify the most central variables in which small changes may lead to a large change in the return. On the other hand, quantitative scenario analysis can be used to facilitate more comprehensive evaluation of investment risks, in which case the outcome is observed against changes in multiple variables (more on scenario analysis in section 2.3.)

In practice, risk is frequently denoted in investment appraisal by simply adjusting the accounting models and formulas used for investment appraisal, i.e., with the use of adjusted required PB period, adjusted RRI, adjusted discount rate, and adjusted cash flows. Some less frequently used methods to evaluate risks include probability analysis, computer simulation, and beta analysis (CAPM); however, despite the "scientific" appeal given to these techniques, empirical research has not found much evidence of wider practical application of simulations or beta analysis (Alkaraan and Northcott, 2006). It should be noted that while the "risk-adjusted" accounting models may lead to more risk-averse classification of potential investment projects through decreased expected returns on investment, these techniques do not provide much additional information on the prevalent risks or offer insights on how they should be treated if the investment was made.

Overall, the quality of risk evaluation is largely dependent on the quality of the used data and the subjective judgments made behind the calculations. Quantitative modeling of investment returns often relies on the practitioner's best guess of relevant variables and their value ranges supported with benchmarks from historical data (Savvides, 1994). However, as Makridakis et al. (2009) note, the future is never identical to the past, and mere extrapolation of past data points and patterns cannot generally be argued to produce accurate predictions. The (unintentional) use of outdated or otherwise non-relevant data may adversely affect the reliability of statistically sophisticated investment appraisal models requiring the use of past datapoints. Nevertheless, it should be acknowledged that the level of stability of both the industry and the environment naturally impact the extent to which historical data may be of use for reliable evaluation (Kosow and Gaßner, 2008).

Interestingly, particularly in complex and uncertain decision-making situations, decision-makers often acquiesce to the incompleteness of the information they possess and rely on post-rationalization to justify their investment decisions (Simon, 1960, p.). In practice, many evaluators rely on mere single-value estimates of investments based on their most likely outcome, such as an average number, or some other conservative estimate. Naturally, for a more thorough evaluation of possible outcomes, other methods should be used alongside simple approximations. As an example, probability distributions can be used to demonstrate the cumulative probabilities for different outcomes of an investment opportunity (Savvides, 1994), building additional information to decision-makers; albeit somewhat arbitrarily.

While sound risk evaluation may enable more informed decision-making, the basic relationship of risk and investment should not be neglected in SIDM, and bearing risk should be accepted as an inherent part of innovativeness and responsiveness to opportunities (Alkaraan and Northcott, 2006); hence, unnecessarily complex risk analysis might eventually become counterproductive. Consequently, practitioners should aim at carefully balancing the time and resources allocated to risk evaluation for making informed enough SIDs against the unavoidable boundaries that exist in the evaluation because of uncertainty.

## **2.2. Mergers and acquisitions**

In this section, the characteristics of M&A as strategic investments are summarized and the main rationales for companies to participate in the M&A market are highlighted. At the end of this section, a few words regarding target valuation are presented as well.

### **2.2.1. M&A as strategic investments**

Mergers and acquisitions (M&A) are a form of strategic investments (Alkaraan and Northcott, 2013) driven by complex patterns of different motives related to both financial and non-financial aspects (see e.g., Trautwein, 1990). On a societal level, M&A embody impactful phenomena that sculpt the landscape for companies across different industries and simultaneously make corporations “disposable” (Vaara and Tienari, 2002); the deals may largely rewrite industry and market dynamics as separate firms merge into large corporations. From companies’ perspective, M&A can be considered as a gateway to growth, continuous development, and transformation of focus upon the demands of shifting market conditions (Rosenbaum and Pearl, 2013).

Decisions related to M&A are one of the many SIDs during which decision-makers cope with the notions of risk, uncertainty, and basic principles of valuation (Ross et al., 2008). Understandably, M&A activity tends to swing alongside the overall economic outlook (Rosenbaum and Pearl, 2013) - when managers are confident and financing options are abundant, deal activity is likely to increase, and vice versa. Ultimately, M&A decisions condense to the question of whether to make or buy (Christensen et al., 2011) as the same growth targeted through M&A can usually be achieved through greenfield investment as well (Rosenbaum and Pearl, 2013).

#### ***M&A types***

In simple terms, M&A refers to the buying and selling of companies through measures of restructuration (Snow, 2023). A company that aims to acquire or merge with another company is often called an acquirer or bidder (DePamphilis, 2015), and the company to be acquired can simply be referred to as the target company. According to Ross et al. (2008),

the legal structures of M&A can be roughly boxed into three forms described in the following.

First, M&A may take place through a merger or a consolidation. A merger refers to the complete absorption of another company. As a result of the restructuring, the target company being absorbed eventually ceases to exist. On the other hand, consolidation refers to a new legal entity being established; by consolidation, both merging companies cease to exist. In literature, the latter is sometimes referred to as a merger as well (e.g., Snow, 2023), or more specifically as a “merger of equals.” In this kind of restructuring, neither one of the consolidating companies dominate and the aim of the procedure may be to harness the “best of both” companies for performance and/or growth gains.

Secondly, M&A can be conducted through an acquisition of stock, which refers to the purchase of another entity’s voting stock with an exchange of cash, share of stock, or other securities (Ross et al., 2008). The transaction grants the acquirer the controlling stake of the target’s equity (Piesse et al., 2022). An acquisition of stock can be pursued, e.g., through a tender offer, an unfriendly (or “hostile”) takeover, or proxy contest (Jensen and Ruback, 1983), which may be used to bypass the target’s resisting management and board of directors (Ross et al., 2008). Lastly, an acquisition may take place through an acquisition of assets. In such acquisition, the company whose assets have been acquired may continue to exist as a legal shell entity unless it is actively dissolved (Ross et al., 2008).

In addition to the categorization based on the legal form of the transaction, the types of M&A can be distinguished based on the (dis)similarity of the industries between the two entities; a horizontal restructuring refers to a transaction between entities operating in a similar industry, and vertical restructuring to the opposite of this (Piesse et al., 2022). In literature, the terms takeover, merger, and acquisition are commonly referred to in synonymic settings despite the potentially major differences in their financial implications. For example, differences between the financial implications of a hostile takeover and a merger of equals have been argued to be significant (e.g., Singh, 1971; Ross et al., 2008). Nevertheless, due to the limited scope of this thesis, the terms are adopted widely for the rest of this paper - merger is used for referring to the merger of equals, and acquisition is

used for referring to the absorption of another company irrespective of whether the target company ceases to exist or not.

### **2.2.2. Unique characteristics of M&A investments**

Various characteristics distinguish M&A from other strategic investments. To begin with, M&A can serve as a relatively rapid way to achieve growth (Piesse et al., 2022) in comparison to often timely and costly product development initiatives. Hence, an acquisition of another company with a fit resource bundle and/or business model for the desired area of growth may appear as a more straightforward way to achieve set growth targets (Snow, 2023); the required resources, processes, and networks can be purchased instead of having to build them from scratch. Christensen et al. (2011) argue that under the right circumstances, the resources of the target can be thought of as separable from the company itself and can simply be transferred into the acquirer's business model to enhance their current performance via various operational mechanisms. Here, the remarkable question is whether the resources of the acquired company are compatible with the acquirer's own resources and processes. However, this perception has also been criticized as human resources and capabilities are strongly connected to different cultural dimensions, and may not be simply transferable (e.g., Teece et al., 2007; Mirc et al., 2023).

Another distinction between M&A and many other kinds of investments is that M&A are often presented as complex multi-phase projects subject to major risks particularly related to target valuation and post-merger (cultural) integration. The riskiness arises from the large scale of the investment required for a deal to begin with, and the dependency between the merger-related benefits and the transacting entities' strategic fit, which can be difficult to quantitatively value using DCF techniques (Ross et al., 2008). Overall, the evident role M&A deals can hold as part of company strategy has been established in literature while acknowledging the ambiguity of the contribution they may have on actual company performance (see e.g., Capron, 1999).

Lastly, it is noteworthy that an exceptionally high rate of failure is commonly associated with M&A deals - many studies indicate as astonishing a failure rate as 50-70% (e.g., Christensen et al., 2011; Bodner and Capron, 2018). Connections between the high failure



rate and poor cultural and social integration have been established (e.g., Björkman et al., 2007; Minbaeva and Muratbekova-Touron, 2011), and some linkages to misvaluation and lagging synergy realization have been drawn as well (Christensen et al., 2011). Overall, the root causes of success/failure can be difficult to pinpoint, and the timing of the evaluation is of high importance. Overall, based on literature, it can be argued that while M&A can offer companies a way to access growth and increase market power rapidly, there are multiple factors make M&A risky and notoriously difficult to execute properly. In addition, M&A can also have complex tax, accounting, and legal effects that need to be accounted for (Ross et al., 2008).

### **2.2.3. Synergy rationales for M&A**

If one begins to study the history of corporate M&A, one may find themselves puzzled with the following question: if the failure rates for M&A deals are as high as evidence suggests, what exactly are the rationales that drive companies to their pursuit?

The rationales for M&A and the weights assigned on each of them may vary from time to time (DePamphilis, 2015). The most common rationales for M&A build around value creation through synergies (Weber, 1996; Capron, 1999; DePamphilis, 2015) to the extent of synergies having been characterized as the most important source of value extracted from a transaction (see e.g., Weber, 1996; Feldman and Hernandez, 2022). Synergy thinking builds on an idea that increased value can be generated through deals between separate entities if their combined worth is higher compared to their worth were they to remain as separate entities; “two plus two is five” (Sirower, 1997; Capron, 1999; Rosenbaum and Pearl, 2013). In addition, synergies may arise from the combination and harmonization of the good parts of the merging entities and disposing of parts that are redundant (Piesse et al., 2022). As part of evaluating the magnitude of potential synergies, one should be mindful of the impact the level of industry similarity can have on the merging entities’ ability to realize the expected synergies. In general, horizontal M&A are considered to embed the highest potential for synergy realization as the likelihood of overlap and redundancy in their operations can be argued to be higher (Rosenbaum and Pearl, 2013).

Conceptually, synergies can be roughly divided into two main sources; operational synergies and financial synergies (Lewellen, 1971; DePamphilis, 2015). In literature, managerial synergies have also been distinguished as their own type of synergy (e.g., Trautwein, 1990); however, for the purpose of this thesis, managerial synergies are considered as part of the operational synergy bundle.

### ***Operational synergies***

Operational synergies can be achieved through attained efficiencies in resource allocation and economies of scale and/or scope often achieved through divestitures (Capron, 1999) and access to complementary knowledge, assets, and skills (DePamphilis, 2015; Piesse et al., 2022), or as revenue synergies arising from better opportunities for sales growth (Rosenbaum and Pearl, 2013). As an example, efficiency in resource allocation may be increased through the replacement of an inefficient management team with a more capable and efficient one, or through the disposal of inefficient and/or unprofitable operating units. Mere improvements in managerial practices may contribute to operational synergies as well (De- Pamphilis, 2015).

On the other hand, economies of scale refer to the increased value attained from cost savings that can be achieved through increases in the scale of an activity and which are commonly linked to higher production volumes (Capron, 1999; Rosenbaum and Pearl, 2013), whereas economies of scope refers to the attainment of cost savings from performing a wider variety of activities enabled by sharing resources that have previously been tied to underutilized capacity (Capron, 1999). Economies of scale can also take place in other functional areas such as R&D, sales, and administrative activities as semi-fixed costs are spread over a larger amount of personnel, or when efficiency in different functions can be improved. Interestingly, it has been argued that the reality of attained cost savings through M&A deals is not as rosy as one may preliminarily think; in fact, it has been argued that cost savings associated with resource-based acquisitions become a proper rationale for a merger if, and only if, the acquiring company has very high fixed costs (Christensen et al., 2011) such as in industries with costly manufacturing or production plants.

Opportunities for reaping benefits from the utilization of complementary knowledge, assets and skills are generally tied to the level at which the merging companies' resource bases align with one another. In some cases, efficient knowledge transfer can enable better realization of revenue-based synergies - be it a more speculative advantage of M&A (Rosenbaum and Pearl, 2013). Overall, enhancements in revenue growth are often associated with the acquirer's ability to sell more of both entities' products without cannibalization, allowing for a wider product and/or service offering across possibly extended market areas (Rosenbaum and Pearl, 2013).

### ***Financial synergies***

Financial synergies associated with M&A refer particularly to lower costs of capital, and the synergies can be achieved through increased entity size or lower risk exposure achieved through diversification (Trautwein, 1990) in cases of vertical M&A transactions; when the activities and cash flows of the merging entities are not perfectly correlated, the merged entity should theoretically become exposed to lower risk. The lower risk may further lead to decreased expected costs of default, and additional leverage accompanied with greater tax benefits may become accessible for the merged entity (Leland, 2007).

The extent to which financial synergies may arise depends on multiple factors, such as tax rates, intrinsic default costs, relative size of the transacting companies, and the riskiness and correlation of their cash flows (Leland, 2007). Financial synergy rationales occur most frequently within the domain of leveraged buyouts (LBO) by private equity firms (Christensen et al., 2011). Surprisingly, even if the main underlying idea for dedicated LBO companies was to generate value to their portfolio companies through operational improvements, the value in their conducted transactions has been found to often reside in their more efficient use of leverage as well as the deal-related tax shield (Christensen et al., 2011).

It is noteworthy that while conglomeration may sometimes facilitate some financial synergies, it is not the type of a merger which can significantly sculpt the merging companies' business model (Christensen et al., 2011), and the argument for financial

synergies arising from diversification has also been criticized as it is common that the shareholders of the merging companies already hold the opportunity to diversify their individual portfolios and achieve the benefits of lower volatility more efficiently on their own (e.g., Lewellen, 1971).

In addition to operational and financial synergy rationales identified in literature, there is some evidence of a linkage between company cash-richness and M&A activity. For example, Harford (1999) finds excess cash reserves to predict a publicly traded company becoming a bidder even when controlling for the company's stock price movements and sales growth. Moreover, they find that companies with generous cash reserves appear to undertake vertical M&A transactions much more frequently than companies with poor cash reserves. When approached from the agency theory perspective and considering the conflicting interests that exist between managers and shareholders (Jensen 1986), a valid question one may think of is whether large buffers of cash make companies more vulnerable to mistakes and poor investment decisions. However, some forms of acquisitions may also provide a channel to control for agency costs associated with free cash flow, such as LBO transactions and other kinds of transactions which take companies private (Jensen, 1986).

#### **2.2.4. The art of valuation**

The valuation of a company is more of an art than science; even though the practice of valuation is quantitative, it is not exactly accurate to deem it as objective as the models used for valuation purposes leave much room for subjective judgments (Fabozzi, 2008). Similarly to other investment appraisal techniques and attempts to quantify ambiguous information, the concept of uncertainty is strongly linked to company valuation as well because the final valuation numbers are always painted by various uncertain assumptions about the future and overall economy. Furthermore, the precision that can be attained through valuation techniques is partially dependent upon the maturity of the company being valued as well as the industry; uncertainty is higher in emerging markets with unestablished structures and uncertain prospects (Fabozzi, 2008).

From the acquirer's perspective, M&A valuation analysis is at the core of positioning the acquirer's perception of a purchase price that represents the value expected to be derived from the deal (Rosenbaum and Pearl, 2013). In competitive bidding situations, companies expecting larger synergies can often present higher bids compared to their rivals (Rosenbaum and Pearl, 2013). Interestingly, despite the valuation part being deemed as a fundamental element indicating the value an acquirer expects to derive from the deal, it has been argued that the stance of whether the potential target is under- or overvalued from the acquirer's perspective tends to take place prior to the actual valuation (Fabozzi, 2008). Notably, if this were true, it may drive skewed analysis in excessive support of the prior assumptions established of the target without objective justification.

The primary valuation techniques used for M&A in many companies can be divided into intrinsic and relative valuation approaches (Damodaran, 2024). The intrinsic value of an asset or company is based on the predicted cash flows to be generated over the lifetime of the asset, being evaluated against the level of uncertainty attributed to those cash flows. The DCF model is one of the commonly utilized techniques for intrinsic valuation approaches (Rosenbaum and Pearl, 2013). On the other hand, the relative approach utilizes market information as basis for valuation, and it may include multiple analysis (e.g., price-to-earnings multiples) built around benchmark companies in the market to arrive at a comparable value (Rosenbaum and Pearl, 2013). In practice, a combination of both approaches is commonly used.

In-depth analysis of these valuation techniques is purposefully excluded from this thesis as the focus of M&A evaluation in this thesis is not on valuation but on the possibilities of using scenario analysis for enhanced target-related risk evaluation and eventually decision-making.

## **2.3. Scenario analysis**

In this section, previous literature on scenario analysis is synthesized to establish understanding of by whom, how, and for what purposes scenarios can be used in organizations. The section includes parts that touch upon the basic nature of the scenario concept, different future perceptions, theoretical scenario typologies, the typical process phases included in scenario analysis, and some techniques that may be of use for practitioners.

### **2.3.1. Scenarios in a nutshell**

The concept scenario can be defined as a description of one possible future state and the paths of development which may lead to that specific state (Börjeson et al., 2006; Kosow and Gaßner, 2008). Alternatively, scenarios can be characterized as holistic storylines of situations an organization may encounter, established through directing attention to potential contingencies and discontinuities within their environment; thereby encouraging creative and productive thinking of the future (Morrison and Wilson, 1997). Importantly, the purpose of a scenario is not to produce a comprehensive image of the future but rather to embody hypothetical sequences of events that are meant to focus our attention on causal processes and decision points (Kahn and Wiener, 1967), and which can also be labeled as constructs that rely upon the deliberate inclusion and exclusion of certain factors, events, and their interrelationships under specific assumptions (Kosow and Gaßner, 2008). Furthermore, the assumptions can be perceived as representations of the mental constructs that are implicitly rooted in our thoughts around the future, and which need to be explicitly articulated in the process of scenario generation. In simple terms, scenarios can provide insights regarding the following two questions: What path leads to the hypothetical future situation? What options do the involved parties have to either impede the (unfavorable) situation or to divert the evolution into another direction? (Kosow and Gaßner, 2008).

Historically, scenarios have been used for decades by governments and economic and non-economic organizations to help steer them through uncertainty (Cairns & Wright, 2017). In the 1940s, the concept was initiated within the US school of military-strategic thinking as it was used to guide the depiction of possible unfolding situations within the battlefield, and

the concept was soon adapted as part of strategic planning and testing by forerunner corporations such as Shell and General Electric (Steinmüller, 2018). Today, scenarios are used by different users in various contexts, such as strategic planning in companies, political consultancy, and land-use planning (Kosow & Gaßner, 2014). In practice, scenarios are usually used to depict alternative future situations to be compared with one another and let the consequences of various developments and decision-making processes occur against a virtual backdrop. Scenarios can serve to test for policy and strategy reliability, robustness, and effectiveness (Kosow & Gaßner, 2014).

There are some key elements that are usually present in scenarios irrespective of the specific approach chosen to compose them: the driving forces, logics, a plot or storyline, and a description of an end state (Fahey and Randall, 1998). The plot or story for a scenario can be built by identifying the key driving forces behind the hypothetical developments for a given scenario. The driving forces may include environmental and/or institutional forces related to, e.g., economic, social, cultural, ecological, or technological advancements and developments. On the other hand, each scenario should be composed based on logical sequences between drivers and events. The logic should be explicitly stated and framed to improve decision-makers' understanding about the plausibility of a given scenario and to help detect any inconsistencies between different assumptions. Storylines and end states are then drawn from the combination of the driving forces and their logics. The scenario process and the techniques that can be utilized for this purpose are further discussed in section 2.3.4.

### **2.3.2. Three future perceptions**

As briefly denoted above, one of the most basic assumptions one must clarify to determine a suitable approach for working with scenarios relates to individual perceptions around the future; that is, is the future perceived as mostly predictable, evolutive, or malleable (Kosow and Gaßner, 2008). If the future is considered as predictable, statistical approaches may offer suitable techniques for scenario work. With this perception, the future is seen as rather “controllable”, and past observations combined to present knowledge can be used as a basis for future scenarios.

On the contrary, an evolutive view of the future holds our present knowledge as inadequate for making predictions about the future, and the future is considered as purely chaotic, uncontrollable, and random. For those with evolutive future perceptions, emergent strategies may be useful for coping with future uncertainties. Moreover, thorough foresight may not be assigned much value to, and intuition is often relied upon in the process of “muddling through” whichever future lies ahead (Kosow and Gaßner, 2008).

Lastly, the perception of a malleable future is positioned somewhere in between the predictable and evolutive future perceptions. Adopting this viewpoint, the future is seen as neither controllable nor fully chaotic. Instead, the possibility for various future developments is acknowledged while believing in humans’ ability to interfere with the developments to alter the future’s course. It can be argued that many companies are likely to incline towards the malleable perception; otherwise, it would make less sense to focus on implementing different strategies and tactics designed to impact the companies’ prospects.

### **2.3.3. Three scenario typologies**

Various scenario typologies have been described in literature, and consensus regarding their use has not been reached within the “fuzzy” field of futurology (Börjeson et al., 2006). Distinguishing between different typologies can become helpful particularly for choosing appropriate scenario techniques that serve different scenario purposes, as described in later sections of this thesis. Although the earliest scenario developers have used the scenario concept without the inclusion of predictive approaches (e.g, Kahn & Wiener, 1967), a broader typology is adopted for this thesis following Börjeson et al. (2006): 1) predictive scenarios, 2) explorative scenarios, and 3) normative scenarios. Below, these three approaches are discussed in more detail while integrating insights from other literature as well.

#### ***Predictive scenarios***

Predictive scenarios consist of forecasting and what-if scenarios that can provide guidance on what will happen, and the scenarios are typically quantitative in nature (Börjeson et al., 2006). The difference between forecasting and what-if scenarios arises from the conditions



placed on what will or might occur. In essence, forecasting techniques attempt to describe what will happen when a predetermined development labeled likely unfolds. Moreover, forecasts are about making predictions of the future as accurately as possible whilst accounting for historical information and knowledge of any future developments that might impact the outcomes (Hyndman and Athanasopoulos, 2021). Forecasts are often made of external factors, such as economic events or demographics, and they suit best for short-term observation - keeping in mind that uncertainty associated with forecasts increases along with time (Börjeson et al., 2006).

In comparison to forecasts, what-if scenarios can be used as a tool to observe how a predetermined near-future event of large significance may impact future outcomes. What-if analysis dives more deeply into the consequences of an event than pure forecasting; it prompts the practitioner to consider multiple possible scenarios for a SID, and the scenarios usually consist of a group of forecasts with discrepancies in more than a single exogenous variable (Börjeson et al., 2006). This is also what separates them from sensitivity analysis, which can be used to test the sensitivity of a single forecast variable to some changes in assumptions. Furthermore, as a form of predictive scenarios, what-if scenarios can be used for assessing the degree of forecasting risk and identify the most crucial components of the success or failure of an investment (Ross et al., 2008).

Since predictive scenarios are used to make predictions of the future, they are also closely tied to the concepts of probability and likelihood (Börjeson et al., 2006). So-called probabilistic scenarios can be considered a branch of what-if scenarios. Probabilities are not always assigned for what-if scenarios possibly due to the apparent flaw associated with them - probabilities are generally pure estimates given by practitioners and experts, and they seldom accurately represent reality (Kosow and Gaßner, 2008).

### ***Explorative scenarios***

Explorative scenarios adopt a broader and often more creative approach to foresight, and they can be used to show guidance on what can happen (Börjeson et al., 2006). They can further be divided into external and strategic scenarios, separated by a distinction in the

scenario practitioner's ability to impact the key variables that drive the scenarios (Börjeson et al., 2006). Here, the external scenarios consist of scenarios driven mostly by external factors, whereas strategic scenarios can be used to observe potential outcomes that follow strategic actions. In general, explorative scenarios can be depicted combining elements from both qualitative and quantitative methodologies, and the time frame for them is usually long.

Generally, explorative scenarios have close ties to the knowledge-function in companies (Kosow and Gaßner, 2008; Schneider and Rist, 2013) as they seek answers to the question of "What do we know and what do we not know?" Explorative scenario work can be used to creatively identify unpredictabilities, various paths of development, and the key factors and logics behind the alternative scenarios. In this context, a scenario user might benefit from making a distinction between the known knowns, known unknowns, and unknown unknowns as distinguished by Makridakis et al. (2009) - explorative scenarios may even allow for the transformation of some previously unknown unknowns to known unknowns.

External scenarios are focused on scenarios driven by external forces outside the scope of control for the practitioner, and they are often used purely to inform strategic planners and/or strategic developers of a company (Börjeson et al., 2006). The idea of generating external scenarios is to provide a framework for the development and evaluation of strategies with an attempt to increase strategic robustness, and the advantage of them lies in the companies' improved ability to design strategies and tactics that can be rapidly adapted to alternative developments (Börjeson et al., 2006) - a capability particularly useful for entities that have limited ability to impact their operating environment. In addition, external scenarios might serve as a channel to increase the receptiveness of a company to weak signals of radical changes in their environment.

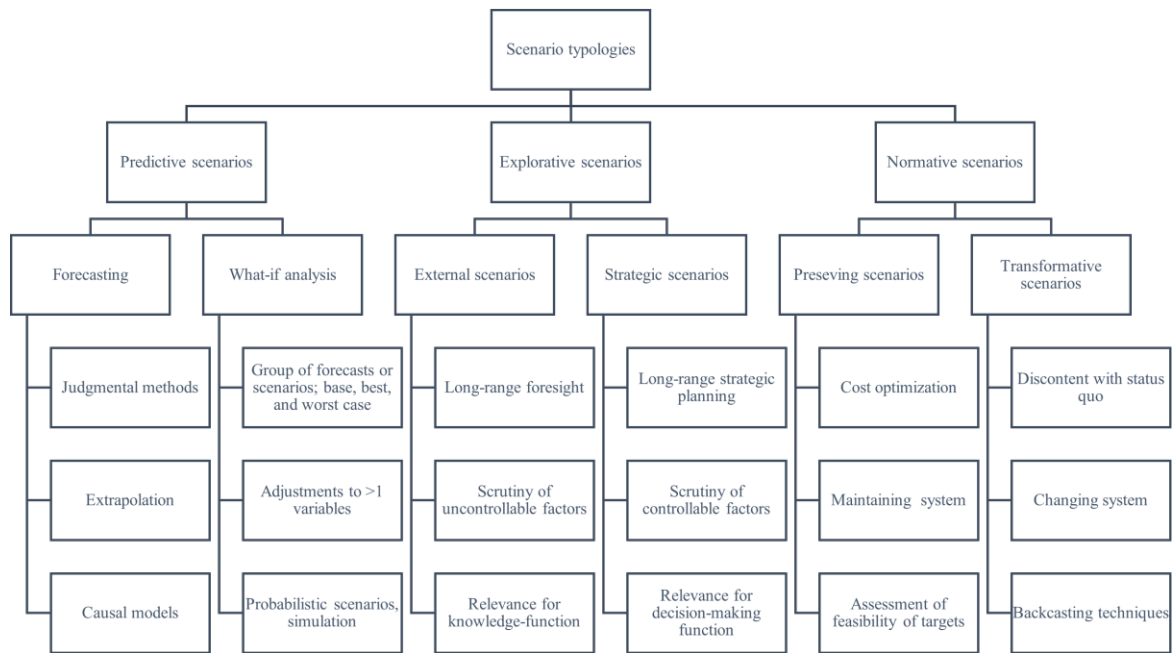
In contrast to the external scenarios, strategic scenarios adopt a more proactive approach to handle possible unfolding scenarios; they put emphasis on internal factors that can potentially be influenced by practitioners, while accounting for some external factors as well (Börjeson et al., 2006). Moreover, they can offer insights into how the consequences of a decision may differ based on which alternative scenario eventually unfolds. Target variables can be set without setting explicit goals, and the impact of different strategies or

policies can be tested against the developments in the variables.

### *Normative scenarios*

Lastly, normative scenarios seek answers to “How can a specific target be reached?” (Börjeson et al., 2006) and they function as vehicles for setting goals and developing strategic plans (Kosow and Gaßner, 2008). Moreover, normative scenarios can be utilized in either a preserving or a transforming manner depending on the attitudes towards the prevailing system structure. In less disruptive environments where the achievement of targets seems possible within the prevailing system structure and its boundaries, the organization might opt for the preservative approach through adjusting their current situation or direction adequately within the system boundaries to achieve a target. More concretely put, the task is to find ways to efficiently meet targets through, eg., optimization models that seek cost-efficiency, or through merely “satisfying” qualitative techniques facilitated through expert judgments and collaboration (Börjeson et al., 2006).

In contrast, if the achievement of a target appears to require a transformation to another system structure, a more suitable option can lie in transformative scenarios. In transformative scenarios, attempts to model the system structure are usually neglected; ongoing trend developments are considered to head into a “wrong” direction, and the prevailing system is seen as part of the problem. Instead of system modeling and optimization, this approach usually entails backcasting techniques, i.e., the starting point for scenarios is situated in the end point and some high-level and deeply prioritized target is determined, and several target-fulfilling future scenarios are developed - including simultaneous discussions regarding the action points necessary to achieve those scenarios. (Börjeson, 2006).



**Figure 1. Scenario typologies and their characteristics.** Based on Börjeson et al. (2006).

### 2.3.4. Five-phase process for scenario analysis

The process for conducting scenario analysis has been split into various multi-phase descriptions in literature (Morrison and Wilson, 1996; Fahey and Randall, 1998; Phelps et al., 2001; Kosow and Gaßner, 2008), and the process can be considerably scaled based on the specific needs of an organization, ranging from highly informal to formal process designs (Schoemaker, 2004). In this thesis, the following five-phase process flow (Kosow and Gaßner, 2008) is focused on and later utilized both to steer the interviews and for the development of the construction (see sections 4 & 5): 1) identification of the scenario field (“P1”), 2) identification of key factors (“P2”), 3) analysis of key factors (“P3”), 4) scenario generation (“P4”), and optionally, 5) scenario transfer (“P5”; later adjusted to scenario learning).

Similar process flows have been formed by various authors, but they often vary in their level of specification and the extent to which different phases are bundled together. For instance, a categorization into four phases has been used as follows; defining scope, constructing database, building scenarios, and choosing strategic options (Phelps et al., 2001). Also, another five-step process has been introduced (Morrison and Wilson, 1996), including the

phases for identification and analysis of the organizational issues, specification of key decision factors, identification and analysis of key environmental forces, establishment of scenario logics, and selection and elaboration of scenarios. Even as extensive as a 12-step process for scenario development has been introduced (Postma and Liebl, 2005), emphasizing the communicative function associated with scenario work. However, due to a simpler and more pragmatic process flow construction aimed at in this thesis, the communicative function is not explicitly included in the chosen process description. Next, each of the five phases following Kosow and Gaßner (2008) are elaborated on separately.

### ***P1: Identification of the scenario field***

The scenario process begins from the identification of the scenario field (Kosow and Gaßner, 2008), during which the practitioner must determine the specific problem(s) under scrutiny. Importantly, the scope of the problem should be restricted with appropriate boundaries to prevent loss of focus and ambiguity. Here, the practitioner needs to make various decisions regarding the extent to which external and internal factors should be considered and how their interrelationships should be treated throughout the process. Furthermore, a clarification of the exact issues at hand and the information hoped to be extracted from the final scenarios may help prevent the scenarios from becoming mere generalizations of the future environment (Morrison and Wilson, 1997).

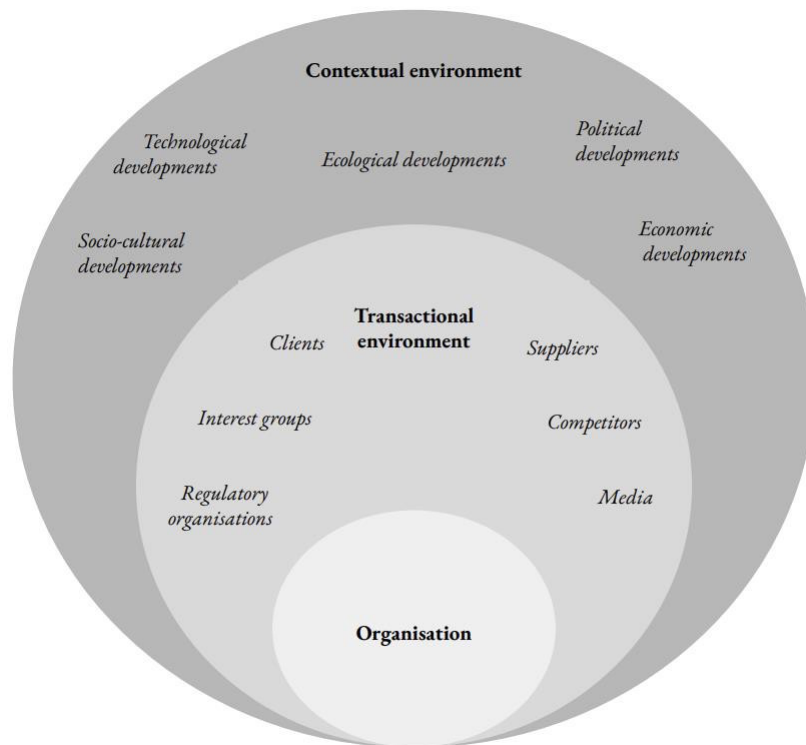
Based on the scenario field identification, it might become possible to identify the most suitable scenario typology and to use its characteristics as guidance in assessing the appropriate scenario techniques for the later process phases. Intuitively, P1 is generally always part of the process irrespective of the specific scenario typologies and techniques used in the analysis (Kosow and Gaßner, 2008).

### ***P2: Identification of key factors***

When the scenario field has been chosen, the scope should be concretized through determining the key factors that drive the phenomenon and/or system central to the scenario scope. Consequently, P2 should result in a more comprehensive look at the scenario field

in preparation for the analysis phase. In practice, the factors that should be analyzed often consist of different variables, trends, developments, and events that affect the scenario field (Kosow and Gaßner, 2008), such as market size, growth, and volatility, or new competing services related to technological developments (Morrison and Wilson, 1997). On the other hand, as noted in section 2.3.1., the drivers can also relate to wider macro-environmental factors such as economic, social, cultural, ecological, or technological advancements and developments. The factors can also be distinguished by the “sphere” they belong to as illustrated in Figure 2 (van Notten et al., 2003); that is, does the specific factor reside in the company’s transactional or contextual environment. This categorization is used for guidance in the later parts of this thesis.

In P2, the importance of external factors has been emphasized (e.g., Morrison and Wilson, 1997) as internal factors are more controllable to the entity, and they become more prominent in later phases concerned with strategic action. Nonetheless, as noted in the prior section on scenario typologies, particularly normative scenarios may follow a backcasting technique aimed at scenarios that are designed for achieving certain strategic targets (Börjeson et al., 2006). Hence, in normative scenarios, internal factors may be definitive for constructing the “wish scenarios” aimed at. On the other hand, for predictive or explorative scenarios, focusing mostly on external factors may be reasonable at this phase. However, this depends much on the purpose of the scenarios, and one should keep in mind that while many factors in the transactional environment (Figure 2) can be considered as partially controllable for an entity, the factors likely present co-dependencies with and can be impacted by various uncontrollable changes happening in the contextual environment, which understandably makes them less controllable for practitioners as well. Based on this, it can be argued that neither factors residing in the transactional nor the contextual environment should be neglected in explorative or predictive scenarios.



**Figure 2. Institution-based spheres in the organizations' environment.** Adapted from van Notten et al. (2003).

There are various methods that can be used to identify the factors during P2. Sometimes the key factors are identified through extensive preliminary desktop research, and sometimes they may be generated through collaborative efforts during workshops or through surveys (van Notten et al., 2003; Kosow and Gaßner, 2008). Many “generating techniques” can be useful during P2 for gathering data, establishing knowledge, and generating ideas for scenario generation (Börjeson et al., 2006). The methodologies are usually participatory in nature; entailing workshops, surveys, and the Delphi method used for gathering and harmonizing expert opinions. Importantly, workshops can be an efficient tool for facilitating collaboration, unlocking the creative aspects of the human mind, and increasing acceptance over decisions among participants (Börjeson et al., 2006). Interviews or interview-like discussions can take place within all these techniques. Some indicative scenario narratives of possible developments in the scenario field can be helpful for identifying the most relevant drivers during P2.

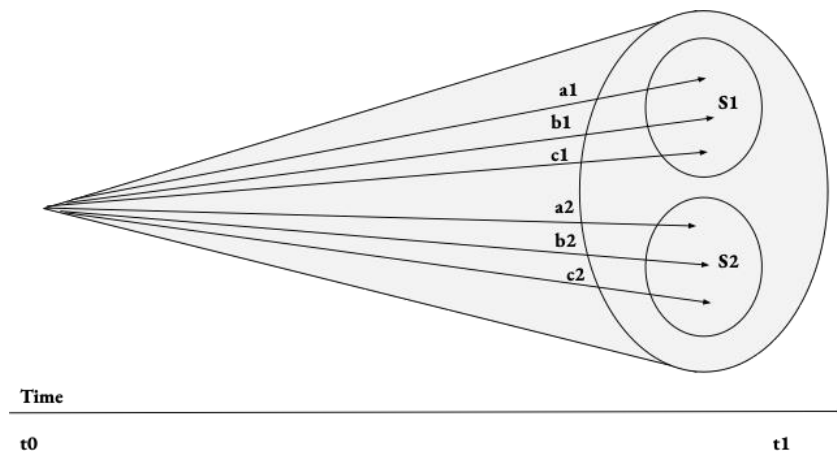
Subjective judgment is central to identifying the key factors for scenarios during P2. As a structured and well-known technique, the Delphi method recognizes the role of human judgment as valid input for forecasting. It allows the compilation of multiple expert opinions, intended to increase the quality of the judgments (Börjeson et al., 2006). The purpose of the Delphi method is not to challenge statistical modeling but rather to complement statistics especially in situations where objective data around the phenomenon is insufficient (Rowe and Wright, 1999).

All generating scenario techniques can be used for various purposes in later phases too, for activities such as generating and reviewing assumptions, underlying data, composed calculations, and the results of the analysis. The techniques can also be used for generating additional input for quantitative modeling.

### ***P3: Analysis of key factors***

P3 involves a deeper look into the key factors that have been sorted out in the prior phase. A distinction between scenario techniques and other analytical tools has been illustrated by presenting scenarios as funnel-shaped descriptions of the future (Kosow and Gaßner, 2008); the scenario funnels represent the value ranges that are assigned to the key factors as part of the analysis (see Figure 3). In multiple scenario analysis, the factors should be analyzed within a broad spectrum of possible outcomes; for instance, one could consider the potential value range for the price of some product ingredient (e.g., between 100 to 200 euros). By doing this, the boundaries of the funnel opening into the future can be drawn (Kosow and Gaßner, 2014). In addition to the analytical skillset required for scenario modeling in P3, the phase usually requires creativity as well, and intuitive judgment is central to the analysis. Various pragmatic scenario techniques are discussed in more detail in section 2.3.5.





**Figure 3. A scenario funnel.** Based on von Reibnitz (1991, p. 38) interpretation of a description by IZT (Institute for Futures Studies and Technology Assessment).

#### ***P4: Scenario generation***

After the key factors have been identified and analyzed, they are eventually combined into coherent bundles and worked up to form alternative future depictions during P4. The scenario generation phase may include techniques from narrative scenario descriptions to “systematic-formalized” quantitative techniques (Kosow and Gaßner, 2008). The number of scenarios often varies based on the specific purpose of the scenarios; however, based on insights from the practical field, the number of scenarios should be limited to approximately three to five scenarios (Alessandri et al., 2004; Kosow and Gaßner, 2008). Limiting the number of scenarios has been suggested to increase the level of meaningfulness that can be attributed to each scenario while ensuring their interpretation remains reasonable.

It should be noted that as various selective decisions must be made as part of the different phases in the scenario process, scenarios are always to some extent normative. In practice, various approaches with both quantitative and qualitative techniques are commonly used in some hybrid form (Kosow and Gaßner, 2008).

#### ***P5: Scenario transfer/learning***

Scenario transfer refers to the application or adaptation of the scenarios developed in one context to another or to a separate organization. Kosow and Gaßner (2008) outline that while

scenarios are often created to address specific issues within a particular environment, they can hold valuable insights that may be beneficial when transferred to different settings as well. However, the effectiveness of scenario transfer depends on how well the original context of the scenario aligns with the new context. Consequently, the success of transferring scenarios is largely dependent on the level of similarity between the original and the new context, and the scenarios often need to be modified to fit the new one. This might include updating data and recalibrating assumptions, or even altering narratives behind the scenarios to fit prevalent culture, external environment, and strategic targets and challenges. On the other hand, meaningful scenario transfer may also depend on mechanisms of organizational learning, i.e., how well the user company is able to transfer the learnings extracted from prior scenario work to other settings.

### ***Organizational learning***

Organizational learning is a process that entails knowledge-sharing among individuals within an organization. Levitt and March (1988) discuss organizational learning as a process that includes collective transfer of past observations into routines that direct behavior under current conditions. The routines may include forms, rules, procedures, conventions, strategies, and technologies colored by a multitude of societal and culture-related aspects that guide day-to-day decisions and actions. Importantly, organizationally established and adopted routines are embedded within the organization, which can build higher robustness against the adverse impact otherwise caused by individual personnel turnover (Levitt and March, 1988); when an individual team member leaves the company, the lessons already learned do not necessarily leave with them.

For effective organizational learning within the context of capital investments, a system that facilitates adequate ex-post assessment of the actual performance of an investment and a comparison against the assumptions made prior to the investment can be argued to be important. Moreover, previous studies have supported the use of post-completion auditing systems for enhancing organizational learning and memory (Azzone and Maccarrone, 2001; Huikku, 2008). As part of post-completion auditing, a company is to systematically scrutinize a previously commissioned investment already generating cash flows and/or

savings, and then compare the results with the pre-investment assumptions (Huikku, 2008). While the value of having formal procedures in place for this has been argued for, Huikku (2011) finds that particularly smaller companies still tend to rely more on less formal knowledge- sharing through other means of interaction and investment control systems. However, particularly for larger companies with a wider variety of investments, established systems can generally present more valuable. In prior research, the time interval for post-completion auditing has been found to lie between 6 to 36 months in practice, one year post investment being the most typical timing (Huikku, 2011).

Within the context of this thesis, scenario transfer is renamed and considered as a scenario learning to better capture the purpose assigned to P5 in the construction. However, the focus of the thesis is mostly on the process elements during scenario analysis and not on the ex-post analysis, and the content of P5 is therefore discussed only briefly.

### **2.3.5. Practical scenario techniques**

There are various schools of thought in terms of scenario techniques, spanning from those advocating for highly formalized techniques to those emphasizing the more intuitive elements in scenario generation (e.g., van Notten et al., 2003; Bradfield et al., 2005; Kosow and Gaßner, 2008). The domain has been described as “methodological chaos” (Bradfield et al., 2005), illustrating the generosity of techniques the practitioners can choose from for scenario analysis. In this thesis, some of the common techniques for scenario analysis will be described based on the categorization by Kosow and Gaßner (2008): 1) trend-based scenario techniques, 2) systematic-formalized techniques and 3) creative-narrative techniques.

The trend-based scenario techniques are mostly built on predictive methodologies such as trend extrapolation and time series analysis, serving as quite simple analysis techniques. On the other hand, systematic-formalized techniques are characterized by high systematization and often require the use of computer-backed analytical models. Lastly, creative-narrative techniques significantly differ from the former as they compose of techniques that build on human creativity and intuition and build heavily on collaboration and communication. As previously mentioned, it is common to apply some sort of hybridization of multiple

approaches with over-lapping elements during the scenario process in practice (Kosow and Gaßner, 2008). It is noteworthy that the techniques presented in this section are not exhaustive.

### **2.3.5.1. Trend-based scenario techniques**

Extrapolation-based time series analysis and trend-impact analysis (TIA) form the basis for trend-based scenario construction (Kosow and Gaßner, 2008). The use of these techniques may involve the use of predetermined structures and mathematical models for data analysis. The basic assumption in this technique is that time series analysis through extrapolation provides a reasonable starting point for the observation of ongoing developments in the field of analysis.

#### ***Time series analysis***

Time series analysis is frequently used to compose forecasts and make predictions of the future based on historical data (Agami et al., 2008; Hyndman and Athanasopoulos, 2021). A trend exists when the analyzed data shows either a long-term increase or a long-term decrease in the data observations, and trend-based information can be used for forecasting future developments using regression models, among other methods (Hyndman and Athanasopoulos, 2021). Trend extrapolation can be useful in stable environments characterized by strong trends and particularly for analyzing the developments in the macro environment, such as in demography, economics, or technology, or when the time horizon under scrutiny is restricted to approximately one to three years (Kosow and Gaßner, 2008).

The advantages of trend-based scenarios lie in their uncomplicatedness and the user's ability to validate the calculations behind them (Kosow and Gaßner, 2008). However, the user should acknowledge that mere extrapolations of past patterns can be naïve despite the feel of objectivity associated with them. They also paint a single possible future instead of multiple alternatives, which may result in excessive reliance upon trends (Kosow and Gaßner, 2008) particularly for them to fit the contextual definition of scenario analysis. Also, it should not be neglected that the historical timeline used for analysis should be long enough

to prevent short-term distortions from occurring. Despite the practical appeal of time series analysis as a simplistic technique, it cannot be considered optimal for compiling explorative scenarios because of its dependence on historical values (Börjeson et al., 2006).

### ***Trend impact analysis***

Trend impact analysis (TIA) can remedy some of the weaknesses associated with pure trend extrapolation as it allows for expert opinions about future developments and enables a switch from a mere surprise-free forecast to a wider spectrum of developments (e.g., Agami et al., 2008; Kosow and Gaßner, 2008). In brief, the method starts from extrapolation, after which a row of experts is composed to establish alternative courses of events which could significantly impact the trend's development (Agami et al., 2008). Advanced TIA can be conducted using dedicated algorithms and Monte Carlo simulations which combine events, and the probabilities assigned to them (Agami et al., 2008) to arrive at a broader spectrum of future states. This should result in a scenario funnel instead of a single line produced by extrapolation. However, the subjectivity associated with the expert evaluations of possible trend-impacting events is considered as a disadvantage of this technique (Kosow and Gaßner, 2008). While TIA is a more comprehensive technique compared to pure trend time series based on extrapolation, the reference scenario for TIA and many other techniques can well be composed using a naïve forecast derived through extrapolating a key dependent factor (Huss and Honton, 1987).

In addition, qualitative trend analysis can be used to complement the “hard” parts of the trend-based analysis, and if no data are available, qualitative analysis may even replace the quantitative part during P3 (Kosow and Gaßner, 2008). Importantly, with the help of qualitative analysis, alternative “outside-the-box” drivers may be identified for more comprehensive scenario work with creative elements. As mentioned earlier, strongly predictive approaches are less frequently referred to in literature concerning scenarios and future studies - a shift from purely quantitative analytical techniques to combinations of quantitative and qualitative techniques has already been adopted in literature (see e.g., Mietzner and Reger, 2005).

### **2.3.5.2. Systematic-formalized techniques**

Systematic-formalized techniques represent a more systematized approach to scenario analysis. Some common systematic-formalized techniques particularly useful for P2 and P3 include impact analysis, cross-impact analysis (CIA), and consistency analysis (Kosow and Gaßner, 2008). The techniques under this category emphasize the assessment of the interrelationships between the key factors identified through trend analysis or other methods. After the factors have been identified, they are bundled and their behavior is analyzed together instead of considering them in isolation (Kosow and Gaßner, 2008). In systematic-formalized scenario techniques, the relatively formal analysis can later be smoothed through textual descriptions. In practice, “raw” scenario narratives are often already unfolding throughout the first three phases of the scenario process. Notably, even if the systematic-formalized techniques appear highly structured and emphasize formalized frameworks, intuition is again at play in their practical application. The three common techniques referred to are more closely discussed in the following.

#### ***Impact analysis***

Impact analysis is a technique that can be used for juxtaposing different previously identified factors to one another with a goal to determine their direct impact on each other. One way to conduct the analysis is to use an influence matrix (see Table 1). In using the matrix, the networked impacts between different factors are assigned numbers from 0 to 3; 0 indicating null influence and 3 suggesting a strong relationship (Blasche 2006, as cited in Kosow and Gaßner, 2008). The “passive sum” in the bottom row shows the extent to which each factor is being passively impacted, and the active sum demonstrates the impact each factor may actively have on other key factors. Based on the analysis using the influence matrix, the most crucial factors (the active and critical factors) can be selected and kept as variables in the scenarios (Kosow and Gaßner, 2008), whereas less relevant ones can be dropped out of the examination.

After unnecessary factors have been filtered out from the analysis, the included factors should be subjectively assigned values within a range to establish the boundaries of the

scenario funnels. This part of the analysis prompts the practitioner to think of which values are realistic, and which are outside the scope strived for. However, scenarios can also be used to simulate more extreme circumstances, and they do not necessarily need to seem realistic for them to be informative.

Impact analysis can be conducted with the help of other systematic-formalized techniques, such as CIA and consistency analysis. Also, if the active and/or critical factors can be directly impacted by the practitioners monitoring their developments, it may be possible to identify some points of intervention as part of the analysis in later phases (Kosow and Gaßner, 2008).

Impact O N OF	<i>Factor A</i>	<i>Factor B</i>	<i>Factor C</i>	<b>Active Sum (AS)</b>
<i>Factor A</i>		2	1	<b>3</b>
<i>Factor B</i>	3		3	<b>6</b>
<i>Factor C</i>	0	2		<b>2</b>
<b>Passive Sum (PS)</b>	<b>3</b>	<b>4</b>	<b>4</b>	
High AS, low PS: active and impulsive factor, “lever” High PS, low AS: reactive or passive factors High AS, high PS: critical or dynamic factors Low AS, low PS: buffering or lazy factors				

**Table 1. Influence matrix.** Adapted from Kosow Gaßner, 2008. Originally presented in Blasche, 2006; 74.

### ***Consistency analysis***

Consistency analysis can be used to control for consistency between or within scenarios and their boundaries (Börjeson et al., 2006; Kosow and Gaßner, 2008). The purpose of consistency analysis is to ensure the logic behind the “variable chains” with different values assigned for key factors. Consequently, consistency analysis serves an important part in securing the eventual credibility of the output of the scenario work. In consistency analysis, at least two possible values are assumed for each key factor, and various values are then bundled together to generate raw scenarios. Mathematically, the number of different

combinations of variables can increase very quickly as the number of factors and their alternative values increases; the aid of a computer program in the analysis can therefore become essential unless the number of factors and their values is kept very low.

Extensive research and the availability of experts that can make trustworthy judgments regarding the variables are prerequisites for formalized consistency analysis (Tietje, 2005). In this technique, factors should be evaluated in pairs against all the values assigned for them; all values of each factor are combined with the values assigned for every other factor, and their consistency is estimated in some systematic manner (Kosow and Gaßner, 2008), such as using a Likert response scale (Hinkeldein, 2009) or other scales that can be used as “consistency indicators” (e.g., Tietje, 2005).

### ***Cross-impact analysis***

Cross-Impact Analysis (CIA) is an analytical approach that accounts for probabilities of forecasted events (Gordon, 1994), and it can be used to analyze the plausibility of different scenarios with the inclusion of both their consistency and probability (Kosow and Gaßner, 2008). The method builds on the assumption that future developments unfold through interactions with other events, and the method focuses most of all on causal relationships between the events (Gordon, 1994; Börjeson et al., 2006). Similarly, as in consistency analysis, the amount of possible event pair interactions increases quickly together with the amount of different possible events included in the analysis.

CIA begins from the choice of events that will be analyzed using the technique. The events may be identified using other systematic-formalized methods or other types of data collection methods. After the events have been clarified, initial probabilities are assigned for each of them to perceive their probabilities without additional conditions (i.e., probability that event A occurs). After the initial probabilities have been determined, conditional probabilities are calculated to study the relationships between events; “if event A occurs, what is the probability of event B (possibly influenced by A) occurring?” (Gordon, 1994). For example, one may attempt to estimate the conditional probability of prolonged traffic jam (event B) in a specific area under the condition that a construction site



is established there (event A).

CIA can be implemented as a stand-alone method or as part of a method combination (Gordon, 1994), often backed by the utilization of a software program (Kosow and Gaßner, 2008). The method has been credited for being highly formalized and therefore suitable for work that needs to be traceable, and it can offer a good starting point for systematic scenario analysis. However, the technique has also been criticized for its over-simplistic, binary approach to the occurrence of events as well as the highly subjective task of assigning probabilities (Kosow and Gaßner, 2008).

### ***Explanatory analysis and optimization***

Explanatory analysis is commonly used in forecasting (Agami et al., 2008), and its use has been studied in the context of scenarios (Börjeson et al., 2006). Explanatory models are often based on causal links between different key variables and equations that connect the variables. Using explanatory modeling, scenarios can be produced within a pre-specified system structure. The use of explanatory techniques may be either very simple or highly complex depending on the assumptions used for modeling purposes. As one could presume, the use of computer programs is often a prerequisite for the use of the more complex modeling (Börjeson et al., 2006), while simple trend extrapolation can be computed in less sophisticated environments as indicated previously as well. Some benefits associated with the mathematical modeling of scenarios arise from them providing the user with quantitative information with consistent predictions and allowing for the quantification of uncertainty (Börjeson et al., 2006), although in a highly arbitrary way.

Additionally, optimization modeling can be used in scenario work, but the technique is mostly useful for normative scenarios designed for fulfilling targets either in a preserving or in a transformative manner (Börjeson et al., 2006). Further discussion regarding optimization is not within the scope of this thesis.

### 2.3.5.3. Creative-narrative techniques

Creative-narrative scenario techniques can be distinguished from the trend-based and systematic-formalized scenario techniques based on their reliance on creativity, intuition, and implicit knowledge shared and unlocked particularly through collaborative efforts (Kosow and Gaßner, 2008). The communication benefits of scenarios can be central to these techniques. On the simplest level, a creative-narrative scenario process may take place as a brief examination and description of alternative scenarios completed by an individual or within a small team. Another possibility is to conduct “complete permutation” of a few possible scenarios by choosing merely two drivers (consisting of a bundle of drivers but taken as a whole) and simply assigning two possible dimensions for them; resulting in a 2x2 scenario matrix with four squares (see Figure 4). In prior literature, this method has been credited as the most popular scenario technique (e.g., van Asselt et al., 2010; Ramirez and Wilkinson, 2014). Understandably, the quality of the scenarios generated using an intuitively constructed matrix is much dependent on the choice of drivers, and whether the drivers can be expected to be strongly inclined towards either a high or a low end.

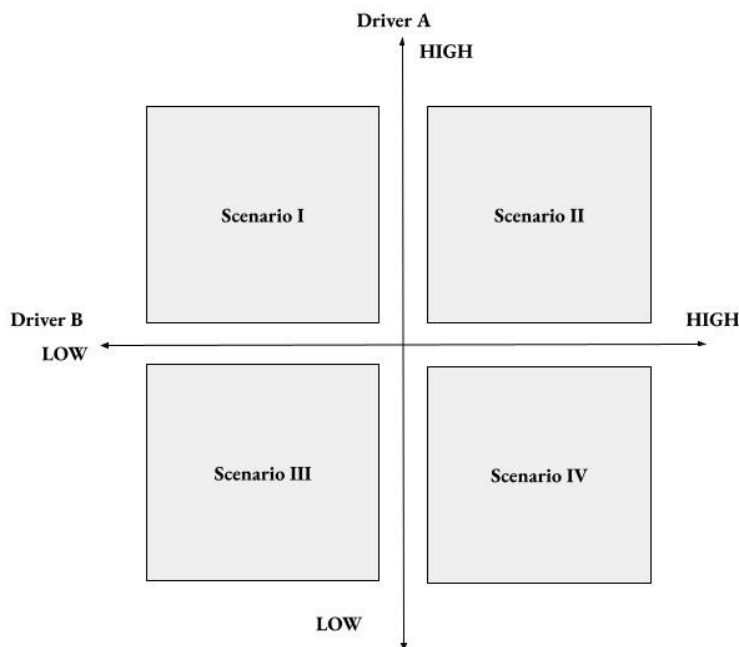


Figure 4. 2x2 scenario matrix. Adapted from van Asselt et al. (2010).

Overall, within the category of creative-narrative scenario techniques, some of the more complex and “holistic” techniques are called Intuitive Logics, Morphologic Analysis (MA), and Normative-Narrative techniques (Kosow and Gaßner, 2008), all of which are explained in the following.

### ***Intuitive Logics***

The Intuitive Logics technique can be traced back to the 1970s as it was then initiated by Stanford Research Institute (SRI) parallel to Royal Shell Corporation (Huss and Honton, 1987; Bradfield et al., 2005; Kosow and Gaßner, 2008). This is the original and perhaps the most famous process for conducting scenario analysis. The underlying idea in Intuitive Logics is to compile all the information available regarding the future and use it creatively to establish patterns and new ideas regarding long-run developments. The technique explicitly allows for intuitive judgments and “gut feeling” to be used as valid input in scenario formulation (Kosow and Gaßner, 2008). It should be kept in mind that the practitioners whose intuition is applied in this methodology are usually experts in the scenario field and closely working with the issues revolving around the scenarios (Kosow and Gaßner, 2008). In this technique, creating a sense of ownership is central to successful scenario work.

Intuitive Logics follows quite a similar process for scenario analysis as other techniques; however, with an orientation towards the decisions that must be made as part of the process. Hence, the process often begins with determination of the decisions and strategic concerns that should be addressed using the methodology (Huss and Honton, 1987; Kosow and Gaßner, 2008). As part of the process, factors in both the transactional and the contextual spheres (van Notten et al., 2003), or “key decision factors” and “key environmental forces” (Huss and Honton, 1987), are included with an attempt to form a comprehensive view of possible developments. The key decision factors might include factors related to market size, price trends, and human resources. Here, basic business analysis tools can be adequate for identifying the transactional factors, but additional insights from experts might increase the quality of the information and consequently improve the quality of the decisions (Huss and Honton, 1987).

On the other hand, factors in the contextual environment should be analyzed using a wider information base; this may require the inclusion of external consultants and analysts, the use of literature, and various information services and databases. The factors can be sorted out using a simple PESTLE framework and analyzed via ranking their unpredictability and impactfulness with descriptive names (see Table 2) As part of the technique, detailed scenario logics should be laid out as logics are at the core of the approach (Huss and Honton, 1987; Kosow and Gaßner, 2008).

Importantly, instead of merely describing the best- or worst-case scenarios, the approach encourages being more creative, and the scenarios should be given descriptive titles and further elaborations through compelling storylines (Morrison and Wilson, 1997). The scenarios drawn from the analysis of the contextual factors can then further be used to compose insights regarding the implications they might have on the identified key decision factors (Huss and Honton, 1987). Moreover, this scenario technique explicitly involves the fifth process phase (scenario transfer) as its purpose is to generate strategic insights and raise awareness of developments that may be relevant for SIDM; the scenarios are ultimately transferred into strategies. The use of Intuitive Logics is mostly associated with explorative and normative scenario typologies (Kosow and Gaßner, 2008).

<b>FACTOR</b>	<b>High uncertainty</b>	<b>Low uncertainty</b>
<b>High impact</b>	<i>“Pivotal uncertainties”</i>	<i>“Significant trends”</i>
<b>Low impact</b>	<i>“Potential jokers”</i>	<i>“Context shapers”</i>

**Table 2. Ranking factors subjectively.** Based on Kosow and Gaßner (2008).

### ***Morphological Analysis***

Morphological Analysis (MA) serves for consistency analysis (Börjeson et al., 2006) in qualitative scenarios, and it is particularly beneficial for examining complex and networked relationships within non-quantifiable and complex problem domains (Zwicky 1969; Kosow and Gaßner, 2008). According to Kosow and Gaßner (2008), MA can be conducted, e.g.,

using a “Morphologic Box”, referring to a process of defining the components in the morphological field, defining alternative hypotheses in the box, and combining the bundles of hypotheses into coherent scenarios either intuitively or more systematically. At the end of the analysis, the scenarios should be textualized as in other creative-narrative techniques as well.

Some of the benefits associated with MA are tied to the way of thinking required for performing the analysis. That is, MA prompts the practitioner to consider all combinations of the different factors included in scenario analysis (Ritchey and Zwicky, 1998; Börjeson et al., 2006). Furthermore, the technique also manages some problem areas associated with scenario work, such as unquantifiable variables, unspecified uncertainty, and lack of transparency in the scenario process. To manage these, MA puts judgment on a more formalized methodological base. As a downside, this may restrict the free, creative flow of thinking needed to compose the scenarios, in which case the technique may eventually become counterproductive.

### *Normative-narrative scenarios*

Lastly, normative-narrative scenario work can be useful particularly amidst organizational change. The technique can be suitable when the purpose of the scenarios is to engage key personnel in the scenario process, build awareness of the requirements for change, and direct the participants’ behavior towards the “normative” future using a positive tone (Kosow and Gaßner, 2008). The process for normative-narrative scenarios is meant to be innovative and motivational, and multi-disciplinary work is encouraged to establish insights. As a creative technique, the method even utilized fictitious narratives of persons and institutions to build the scenarios, and the process often involves multiple workshops and other participatory activities (Kosow and Gaßner, 2008). Because the approach is mostly associated with normative scenario typologies not central to this thesis, further elaboration of the methodology is not included in this literature review.

## **2.4. Synthesis of the literature review**

The literature review for this thesis covered a range of conceptual definitions, theoretical insights, methods and techniques, and practical considerations concerning SIDM, M&A, and scenario analysis. Emphasis in the review was on matters that revolve around the concepts of risk and uncertainty and the means for companies and decision-makers to cope with them. The fundamentals to be kept in mind for the rest of this thesis are summarized in Table 3 at the end of this section.

To summarize, SIDM involves remarkable managerial decisions that may significantly impact an organization's long-term performance. The process embeds high levels of risk and the results of SIDs are often merely partially quantifiable (Alkaraan and Northcott, 2006). The rationales for strategic investments have been categorized to strategic and financial rationales, which often interconnect with each other. Particularly investments with strategic rationales are crucial for organizations' abilities to achieve their long-term strategic targets, and to maintain and enhance their competitive positions in competitive market environments (Slagmulder, 1997).

As part of SIDM, a variety of investment appraisal techniques are used in companies, of which traditional forecast-based methods such as the NPV, IRR and PB dominate in practice (Moore and Reichert, 1983; Graham and Harvey, 1999; Alkaraan and Northcott, 2006). Despite their popularity, these methods may not adequately account for uncertainties and complex variables impacting the outcomes of strategic investments, and Courtney et al. (2013) suggest companies to consider the application of other analytical tools such as scenario analysis and simulation. Notably, a major challenge in SIDM lies in the task of estimating the investment cash flows; an ungrateful task for humans faced with future uncertainty and the high probability of making misjudgments in their estimations.

M&A are major strategic investments central to this thesis. From companies' perspective, M&A are a way to grow inorganically and develop as entities while transforming their focus to fit the demands of shifting market conditions (Rosenbaum and Pearl, 2013). The decisions related to M&A transactions are complex and involve multiple phases from target

identification to valuation and post-merger integration. Importantly, M&A investments carry unique characteristics and risks, such as the difficulty associated with quantifying the strategic fit of entities, the sky-high failure rates (Christensen et al., 2011; Bodner and Capron, 2018) often attributed to poor cultural integration (Björkman et al., 2007; Minbaeva and Muratbekova-Touron, 2011), and misvaluation prior to deals, or unexpectedly low synergy benefits compared to what has been anticipated (Christensen et al., 2011). Indeed, some of the primary rationales for M&A lie in synergies; the combined value of the merged entities is considered to exceed their individual values as separate entities. The expected synergies can be operational, achieved through cost savings and efficiencies, or financial, achieved through reduced capital costs and enhanced tax benefits (e.g., Lewellen, 1971; DePamphilis, 2015).

As a method to identify and hedge the risks and uncertainties associated with SIDM and M&A in particular, scenario analysis may offer useful methodologies for companies. Scenario analysis can be categorized into predictive, explorative, and normative scenario typologies (Börjeson et al., 2006), each serving different purposes and entailing various techniques. Predictive scenarios focus on forecasting and "what-if" analyses, providing guidance on what will happen, while explorative scenarios shed light on what can happen, incorporating both qualitative and quantitative elements to explore various paths of development. On the other hand, normative scenarios focus on how specific targets can be achieved, either by preserving current system elements or by aiming at higher levels of transformative action (Börjeson et al., 2006).

Interest towards scenario analysis methodologies has been increasing over the past decades, and literature on the surface-level process phases for scenario analysis as well as the main pragmatic techniques for each phase is abundant. However, no clear consensus exists on the typologies and techniques that best fit different circumstantial needs, particularly within the domain of managerial accounting, and literature on process design for real-life contexts is lacking. In this thesis, the synthesizing work of Kosow and Gaßner (2008) is used as main guidance for choosing the elements for the scenario process flow designed for the case company.

<b>SYNTHESIS OF THE LITERATURE REVIEW</b>		
<b>Research area</b>	<b>Key considerations in this thesis</b>	<b>Key papers in this thesis</b>
<b>SIDM</b>	<p>Decisions with long-term impact</p> <p>Characterized by substantial investments and risks</p> <p>Traditional appraisal techniques (i.e., NPV, IRR, and PB) may excessively overlook uncertainties</p>	<p>Alkaraan and Northcott (2006)</p> <p>Courtney et al. (2013)</p>
<b>M&amp;A</b>	<p>Rapid way to grow and increase market power</p> <p>Main rationales in financial &amp; operational synergies</p> <p>Complex multi-step process with uncertain outcomes</p> <p>Very high failure rates (e.g., unrealized synergies, overpayment)</p>	<p>Christensen et al. (2011)</p> <p>DePamphilis (2015)</p> <p>Rosenbaum and Pearl (2013)</p>
<b>Scenario analysis</b>	<p>Division into predictive (what-if, plausible), explorative (possible), and normative (desirable) scenario typologies</p> <p>Creation of distinguishable narratives of the future, particularly helpful in uncertain contexts</p> <p>Bundle of methodologies available for practitioners; trend-based, systematic-formalized, and creative-narrative</p>	<p>Börjeson et al. (2006)</p> <p>Kosow and Gaßner (2008)</p>
<b>Table 3. Synthesis of the literature review.</b>		



### **3. METHODOLOGY**

Next, the research methodology and data collection process for this thesis are outlined, providing the foundation for understanding how the study was conducted and how the findings were derived. This section details the rationale behind the chosen research methodology, the techniques used for data collection, and how these approaches align with the overall research objectives. The following subsections delve into the role of qualitative research in accounting, describe the use of single-case study and the constructive research approach in the domain. Additionally, the concepts of generalizability, reliability, and validity are explained, and this thesis is critically evaluated within these concepts.

#### **3.1. Research methodology and data collection**

The choice of research methodology should be based on the research problem and the objectives set out for a study (Hopper & Powell, 1985), and making an appropriate choice requires critical reflection on the study's purpose (Yin, 2003). The objectives for this thesis are twofold; to map how scenario analysis can be leveraged for enhanced decision-making within M&A in the case company, and to use the findings to design a construction for the company to serve this purpose in practice. For fulfilling these objectives, qualitative single-case study with a constructive approach was chosen as the research methodology for this thesis.

Data collection for the thesis involved five semi-structured, in-depth interviews with company executives and managers (see interview summary in Table 4). The interviewees are frequently involved in the company's M&A process either as decision-makers or contributors to investment appraisal and the evaluation of assumptions made for target valuation and risk evaluation through scenario and sensitivity analyses. For enhanced data triangulation, other materials, such as documentation of previous M&A investment proposals presented to decision-makers, were utilized. The use of various data sources was meant to help establish a more thorough view of the current practices and policies for SIDM, M&A, and risk/scenario analysis in the company.

<b>Interviewee</b>	<b>Interview date</b>	<b>Interview place</b>	<b>Interview length</b>
CFO	27.5.2024	Company office premises	60 min
Head of Business Controlling	27.5.2024	Company office premises	62 min
M&A Manager	29.5.2024	Company office premises	65 min
Head of Sales and Partnerships	7.6.2024	Teams	57 min
Head of Business Controlling & CFO	1.12.2024	Company office premises	30 min (overview of the final construction)

**Table 4. Summary of the interviews.**

In the beginning of the interviews, the main typologies of scenario analysis (section 2.3.3.) were explained to ensure all the participants were speaking on equal understandings during the interviews. The interview template (see appendix) was designed to enable establishing a solid overview of the company's current situation and environment and to help address any pitfalls and challenges that should be accounted for in the new scenario analysis process design. Moreover, the semi-structured interview approach allowed for deeper elaborations regarding the problem areas. After mapping the current situation, the rest of the interviews were mostly aligned with the scenario analysis process phases covered in the literature review's section 2.3.4. In this part of the interviews, the personnel could present their ideas and opinions to impact the content of the construction. Later, during the post-interview phases of writing this thesis, the main contact person from the company was asked to comment on the interview findings presented in section 4. By this, the company was given the opportunity to correct possible misunderstandings, give clarifications, and contribute to the construction upon their wish.

In the following, literature insights regarding qualitative research in accounting and the CRA are presented to justify the choice of research methodology.

### **3.2. Critical overview of CRA**

#### *Qualitative case study in accounting*

In accounting research, qualitative research has allowed researchers to acknowledge the bifurcations that exist between the textbook view of management accounting and organizational reality; to understand the lack of rationality and the political and power-related nuances that sculpt organizations' actions in the real world (Vaivio, 2008). Through qualitative research, researchers have gained the ability to perceive management accounting as a rather multifaceted and context-specific domain instead of a fixed set of rational practices that mechanically take organizations towards their targets. In qualitative research, empirical findings are collected from the field, e.g., in the form of interviews, surveys, or by simply making observations (Kasanen et al., 1993).

Case study has been adopted as a valid research method across various academic disciplines since a long time ago (Cooper and Wayne, 2005), and it has later gained popularity within management accounting research. As in other qualitative accounting research, case studies typically combine different data collection methods, including the use of company archives, interviews, surveys, and other observations (Eisenhardt, 1989). In single-case study conducted with an intensive research design, the depth of the study creates a proper foundation for rich contextual observations regarding the phenomenon under research (Vaivio, 2008; Erikson and Kovalainen, 2008).

However, the generalizability of single-case studies conducted through intensive case study remains limited. In contrast to single case study, multiple case study usually entails a comparative approach and each organization in the study can therefore be studied less intensively (Vaivio, 2008). On one hand, even when the analysis of single organizations is not as intense, the study methodology provides the researcher an opportunity to focus on cross-case patterns in the search for distinguishing factors between organizations (Vaivio, 2008). In turn, this can pave the ground for more detailed theoretical understanding (Eisenhart, 1989; Vaivio 2008).

The popularity of the case study method can be explained above all with reasons related to the method's ability to squeeze complex business problems into more accessible, descriptive, and "down-to-earth" format (Erikson and Kovalainen, 2008). As part of qualitative accounting research, case studies have held significant contributions to revealing how practical findings may deviate from management accounting theory (Vaivio, 2008), and they can be a good source of knowledge for understanding the practical management accounting issues in companies (Scapens, 1990). However, the question of depth versus breadth is central to the study design and should be addressed carefully.

### ***The constructive research approach***

Practically oriented accounting research has been called for in prior research (see e.g., Kasanen et al., 1993; Labro and Tuomela, 2003; Malmi and Granlund, 2009). As a pragmatically oriented research method, the CRA may answer the gap between accounting research and its relevance for practitioners (Rautiainen et al., 2017). The CRA in management accounting refers to problem-solving through the creation of organizational procedures and/or models ("constructions") that function as solutions to explicitly identified managerial problems. Hence, the crucial prerequisite for the method is that a practically addressable problem has been identified. The construction created based on the research findings is the most central element in the approach, and it should have both practical and theoretical relevance. Moreover, the construction should be functional, and it should be simple enough and easy to use for practitioners (Kasanen et al., 1993).

In this thesis, a clear problem was outlined as the company expressed a need for a systematized scenario analysis process to improve risk identification and decision-making in M&A. The current policies were considered blurry, and lack of clarity around responsibilities deterred the company's ability to conduct the analysis in a systematic and coherent manner. In this thesis, the construction is designed keeping in mind the requirements for practical functionality and simplicity in the CRA.

### ***CRA Market test***

According to Kasanen et al. (1993), testing the construction's relevance using either a weak, a semi-strong, or a strong market test is central to the approach. The minimum requirement for completing a weak market test is that a person responsible for the financial results of the entity is willing to apply the construction to practical use. On the other hand, a semi-strong market test entails a wider adaptation of the construction across multiple organizations. The strong test requires that evidence is available of the improvements in financial performance achieved with the construction. Nonetheless, even a weak market test can be argued to be relatively strict; stronger market tests often require extensive statistical analysis, and the process for it may take a long period of time (Kasanen et al., 1993).

Fulfilling the criteria for testing the construction's relevance, a weak market test for this thesis has been completed as the professionals interviewed for the thesis have expressed a willingness to apply the construction to their M&A decision-making processes (see section 5, subsection 5.2.7.). The construction is not meant to be an exhaustive framework for scenario analysis with all the bits and pieces figured out at this point, but rather to describe the systematic process phases that could support the company's ability to overcome the challenges related to the use of scenario analysis in their SIDM. The content of each phase will likely be iterated on and adjusted based on insights, if applied into practical use.

### ***Contribution and relevance of the CRA***

Interestingly, while clear criteria for testing for the pragmatic relevance of the CRA has been articulated, criteria for addressing its theoretical contribution have been discussed less. However, Rautiainen et al. (2017) argue that analyzing the relevance of the study from four separate angles could benefit the research agenda. To enrich Barth et al. (2001) division of relevancy into value and decision relevancy dimensions, more comprehensive analysis can be conducted using four dimensions: practical value relevance, legitimate decision relevance, academic value relevance, and instrumental decision relevance (Rautiainen et al., 2017). This division serves the need to separate between the academic and practical requirements given for the construction.

Practical value relevance may entail long-run financial benefits for the organization, whereas academic value relevance stands for contributions to science and the creation of new knowledge. On the other hand, legitimate decision relevance can be assessed to examine improvements in the studied organization's position in terms of stakeholder and societal support, such as through access to sources of funding. Lastly, instrumental decision relevance may facilitate short-term operational efficiency gains. Obviously, many sources of relevance may co-exist, be complementary to each other, or sometimes even conflict with each other (Rautiainen et al., 2017).

The construction in this thesis serves mostly for practical value relevance and possibly instrumental decision relevance. The practical value relevance is expected to arise from enhanced decision-making for major, strategic M&A investments. If successful, scenario analysis can help the company avoid resource expenditure on M&A targets that do not support the company's long-term financial and strategic goals. At best, scenario analysis can reduce the number of unforeseen risks, help in risk mitigation, and give confidence to invest into less known territories. In the shorter term, the company can use the construction to find new opportunities for operational synergies and efficiencies through M&A as well. The academic value relevance and legitimate decision relevance associated with this thesis are less apparent but not non-existent; however, research regarding scenario analysis within SIDM and particularly M&A remains scarce, and this thesis contributes to the academic domain mostly indirectly by raising questions around the topic and examining the potential for combining these concepts.

### ***Criticism towards the CRA***

Despite the opportunities the CRA brings for enhancing the pragmatic usability of accounting research, the method has remained scarce in its application and received some critical commentary as well (Kasanen et al., 1993; Kaplan, 1998; Labro and Tuomela, 2003). Kasanen et al. (1993) suggest the reasons behind its scarce use lie in the consultative nature of the work associated with the CRA, partially colliding with the methods that have been used to develop the accounting research domain. Moreover, the research work

performed as part of the CRA may require establishing a consulting-like relationship between the researcher and the organization, and the outcome may entail monetary value; hence, the findings may be purposefully withheld from publication in scientific journals (Kasanen et al., 1993).

However, there exists various characteristics to the CRA that distinguish it from consulting. Most importantly, the CRA focuses on innovative constructions while the main methods in consulting often relate to the use of existing and tested tools to tackle specific problems (Labro and Tuomela, 2003). In contrast, academics are more inclined towards the creation and dissemination of new knowledge compared to consultants (Kaplan, 1998). On the other hand, the accounting research domain has historically adapted various research methods from natural sciences and applied them to management accounting research with an attempt to establish the domain's credibility in the academic agenda. Notably, the use of action research addressing practical, real-life problems has been more extensively adopted in social sciences compared to accounting (Labro and Tuomela, 2003).

Finally, it should be noted that as part of the choice of research methodology for this thesis, consideration was given to alternative study designs as well. Moreover, focus on deeper analysis of the current scenario analysis process in the company and the possibilities for its mere improvement were initially under consideration; however, because the company's scenario analysis process is not highly developed, mutual agreement between the researcher and the company's representative was established for the need to design a new construction instead. Overall, the chosen qualitative research methodology enabled the required breadth and depth for the analysis during the study period.

### **3.3. Generalizability, reliability, and validity**

Addressing the generalizability, reliability, and validity of a study should be a part of the research process. Below, these concepts are briefly introduced with a discussion of their applicability in qualitative case studies and in the CRA.

## ***Generalizability***

Generalizability refers to the extent to which research findings can be generalized and extended into wider contexts. A researcher's ability to generalize their findings refers to recognizing linkages between the researcher's own findings, findings of others, and other concepts or phenomena (Parker and Northcott, 2016). Understandably, generalizations build on a presumption of the structural similarity of the past and the present (Lukka and Kasanen, 1995); for what has been researched in the past and has proven useful now, making a generalization implicitly indicates an expectation of achieving similar results in the future as well. As discussed in the literature review, this assumption is somewhat problematic, and not even sophisticated statistical methodologies can eliminate the problems associated with this (Lukka and Kasanen, 1995).

Consequently, uncertainty associated with generalizability is always present, and this has received attention especially in terms of the qualitative case study methods utilized in accounting (Yin, 2003; Vaivio, 2008; Parker and Northcott, 2016). To counter the criticism around generalizability, Vaivio (2008) states the research findings of qualitative research are not necessarily meant to be statistically generalized - not even if this is one of the frequently used methods for generalization in accounting research (Scapens, 1990). Instead, the findings can entail properties that better serve for theoretical generalizability (Lukka and Kasanen, 1995).

Moreover, Lukka and Kasanen (1995) present three generalization rhetorics that triangulate in accounting research: the statistical generalization rhetoric, the contextual generalization rhetoric, and the constructive generalization rhetoric. Most of the modernist accounting research falls under the statistical generalization rhetoric (Scapens, 1990; Lukka and Kasanen, 1995), in which the statistical methods provide tools to address the generalization of the study and conform its reliability through methods such as measuring confidence intervals. The statistical methods are generally accepted as valid methodologies, which provides the rhetoric a solid ground. On the other hand, the contextual generalization rhetoric can be utilized when the studied phenomena relate to some real-life phenomena for which general structural relationships can be discovered and communicated. The validity of the research



results may be extended beyond primary observations using effective data triangulation. Lastly, the constructive generalization rhetoric is often applied to studies conducted using the CRA; in this rhetoric, the researcher may argue for the generalizability of the solution based on its successful implementation in the case organization, thereby prompting the construction should work in similar settings in other organizations as well.

Overall, the prerequisites for generalizability can be assessed for all accounting research in three rough dimensions: considering the general theoretical knowledge of the area of interest, prior empirical findings and their interpretations, and similar aspects of the research at hand (Lukka and Kasanen, 1995). Particularly in case studies, the problem of generalizability is often tackled by seeking for large theoretical and/or practical relevance of the research topic, triangulation of research methodologies, and the depth of analysis and the richness in findings interpretation (Scapens, 1990; Lukka and Kasanen, 1995).

### ***Reliability and validity***

The concept of reliability can be used to refer to the quality of the data utilized for research purposes, indicating the extent to which the researcher can rely on it. Reliability may be hindered if the data are not free from “accidental circumstances”, such as a survey respondent’s inconsistent answers to a survey due to lack of attention (McKinnon, 1988). On the other hand, validity refers to whether the researcher is factually researching the topic they intend to research. Validity is maintained when the researcher can control for the researched phenomena in that it does not extend to other phenomena or unjustifiably shrink from its original scope (McKinnon, 1988). The major threats to reliability and validity can be categorized into four distinct categories as follows (McCall and Simmons, 1969; Simon and Burstein, 1985, as cited by McKinnon, 1988): observer-caused effects, observer bias, data access limitations, and complexities and limitations of the human mind.

The observer-caused effects refer to factors induced by the observer's presence in the field. More specifically, there is evidence of a change that takes place in the observant’s behavior because of them being observed. For ensuring minimal impact of this threat on the data for this thesis, the interviewer was presented as a consultative researcher with a specified

agenda to assist the company's decision-making with the use of reliable interview data. Moreover, the interviewees were mostly from high-level positions, which decreased the risk for behavioral changes that could occur in their responses; the interviewees not having to be afraid of "managerial spying" (McKinnon, 1988).

The observer bias, on the other hand, is a concept used to describe the observer's tendency to observe the research setting in a consistently biased manner (McKinnon, 1988). Moreover, the researcher may have some initial beliefs and perceptions that sculpt their interpretations of research findings. As the issue is always present in different research settings, attempts to fully eliminate it may not be reasonable. Instead, attempts to manage the observer bias can be more effective. Naturally, as the CRA involves the researcher being highly involved in producing the construction, the threat of observer bias may be magnified (e.g., Lukka, 2003). As part of controlling for observer bias, the template for the semi-structured interviews was read by another person prior to conducting the interviews to ensure the questions were not constructed in a biased manner. Moreover, the researcher attempted to maintain objectivity and "distance" to the topic throughout the interviews and the analysis of them. Also, the findings were retrospectively discussed with the company representative to control for possible biased interpretations.

For one, data access limitations form a boundary condition for the data available for study. These limitations may arise from the researcher's limited time on site and the representativeness of that time, this being a risk more apparent for empirical observation in the field instead of interviews. In other terms, the observations made during a specific time may be somehow distorted if some abnormal instance causes the observant's behavior to change. Also, another limitation relates to restricted access to data imposed by the research hosts. Not all relevant data may be given access to for various reasons. To limit potential impact of data access limitations during data collection for this thesis, the researcher signed a non-disclosure agreement with the company, and the interviewees can be expected to have felt more comfortable to disclose confidential information for research purposes both as part of the interviews and with additional documentation drawn from the archives.

Lastly, the complexities and limitations of the human mind encourage us to think of the reliability that can be assigned to the statements made by humans - it may be reasonable to not take every statement at face value (McKinnon, 1988). Broken down to two major concerns, the subjects may either purposefully seek to mislead the researcher, or they may intend to be honest and thorough and yet fall victims to the fallacies of the human mind. Moreover, people may forget matters or get distracted during conversations, and biased thinking may impact the answers and behavior of those being observed and interviewed similarly as they affect the researcher (McKinnon, 1988). However, probing questions have been identified as an effective way to mitigate the threat (McKinnon, 1988). Consequently, during data collection for this thesis, the researcher attempted to address the complexities and limitations of the human mind particularly by asking probing questions depending on the tone of the answer to a specific question and/or when some area of the discussed topic seemed unclear. Also, the researcher aimed at granting enough time for the interviewees to prepare for the interviews by sending the question template to the interviewees in advance.

### ***Summary of the methodology section***

To summarize, this methodology section of this thesis outlines the chosen research design and the process for data collection for understanding the study's execution and derivation of findings. The selected qualitative single-case study with the CRA approach aligns with the study's dual objectives: enhancing decision-making in M&A within the case company and designing a construction for this purpose. The section also includes a critical overview of qualitative research in accounting, highlighting its strengths and limitations, particularly in the context of single-case studies. It also justifies the use of the CRA, emphasizing its relevance for practical problem-solving in management accounting. In addition, the concepts of generalizability, reliability, and validity and their applicability to qualitative case studies and the CRA are elaborated on. As discussed in this section, the chosen methodology ensures a solid foundation for the study, with careful considerations given to threats to reliability and validity in terms of potential biases, data access limitations, and the complexities of human cognition.

## 4. EMPIRICAL FINDINGS

### 4.1. Introduction to the case study setting

The case company for this thesis is a large Nordic company operating in the social and healthcare industry. The company was selected for this thesis based on research interest and alignment between the research objectives set for this thesis and the company's current development initiatives. In addition to greenfield investments, one of the most important enablers of growth for the company is M&A, and the company is actively monitoring, evaluating, and pursuing strategically fit M&A targets. At the time of the interviews, the company did utilize some scenario analysis methods as part of their SIDM process, but the analysis was described to lack systematization and significant improvements were expected to be achievable through careful planning. Moreover, the scenarios seemed to be strongly characterized by a predictive tone (i.e., "what-if" scenarios) instead of well distinguishable futures.

During the interviews, the company's internal structure, processes, and policies were being re-developed, and fine-tuning the scenario analysis process as well fit the company's ongoing initiatives. At the start of the interviews, it remained unclear which scenario analysis approach would be most suitable for the company's purpose, but the core idea was to maintain emphasis on the predictive while extending, customizing, and systematizing the process according to findings from the interviews. The company's Head of Sales & Partnerships described their current use of scenario analysis as follows:

*"We do scenario analysis but not very systematically. Systematization of our doing is central to what we want to strengthen right now. As part of our everyday meta process, our scenario analysis starts from the M&A Manager. The M&A Manager makes a proposal which we contemplate on, and then we raise questions ... like hey, what if we were to assume or do this instead. ... During the last case, I told our M&A Manager we should compose three different models of how things could turn out. It's not scenario analysis per se, but it has the same idea behind it; the idea of having [different models] built upon elements different from each other." - Head of Sales & Partnerships*

In the beginning of the study, the fit between the CRA (see section 3 for more details) and the company's circumstances was further strengthened by abrupt legislative changes that were initiated within the company's core operating field. Significant changes were to take place in the company's contextual environment, i.e., outside the scope of the company's executives' direct influence. To cope with the uncertainty posed by the changes, extending the company's SIDM toolbox was considered beneficial particularly for M&A. At best, a more systematic scenario analysis process could enable improvements in risk evaluation for M&A investments particularly in decision-making contexts characterized by higher uncertainty, as stated by the Head of Business Controlling:

*“There are risks that touch upon the whole industry. Operative risks are quite basic stuff for us, and the focus of our scenario analysis should be on larger shifts within the industry; shifts that increase project sensitivity.” - Head of Business Controlling*

The Head of Business Controlling emphasized the company has good knowledge of and is quite comfortable with the most typical, operative risks that remain much the same for investments in key operating areas. However, the upcoming larger shifts in the industry had raised more questions as their impact was more uncertain and they could simultaneously have long-term impact on the company; therefore, the shifts were seen as natural focus areas for scenario analysis.

Importantly, a structured scenario analysis process was expected to accelerate already ongoing discussion around the company's prospects and risks that should be acknowledged during SIDM. Expectedly, various benefits were anticipated to arise from scenarios, such as improved capabilities to identify risks and opportunities and to coherently communicate insights to decision-makers. In addition, stronger personnel commitment and enhanced communication flow were considered as advantages of collaborative scenario work. In essence, the expected benefits of scenarios were condensed into presenting more credible business cases for decision-makers, particularly when subject to group-level scrutiny:

*“We want to identify risks, opportunities, and different options [prior to decisions- making]. Our M&A cases are usually decided upon on group-level, and for decision-making, we want to ensure various alternative scenarios have been considered and that the case can be presented in a comprehensive format for decision- makers. After all, nothing ever turns out exactly as planned. ... Even communication is one benefit of scenarios. On the other hand, I think scenarios also do create the foundation for further implementation of a specific project; ensuring commitment and setting expectations for the longer run.” - CFO*

It is reasonable to highlight that despite the interviewees’ interest towards explorative scenario analysis focused on larger industry force developments as well, the formation of a construction serving this purpose would likely require group-level contribution. Moreover, a more suitable place for building such extensive, explorative scenarios is at group-level and should be linked to upper-level strategy formulation – after all, strategic preferences would likely dictate the choice of scenario approach, and the scenario outcomes would likely impact the focus areas in the strategy. As noted in the literature as well, explorative scenario analysis is usually conducted for the longer run and with the inclusion of a wider panel of experts. The CFO characterized the role of group-level strategy in their local SIDM as follows:

*“Group-level strategy gives us a framework for our strategy. There is a space within which we can move, operate, and adapt to changes while balancing with the boundaries of the group-level strategy.” - CFO*

Because of the previously discussed, explorative scenario analysis conducted explicitly for long-run foresight and strategy formulation is not focused on in the construction created as part of this thesis. Instead, the objective is to create a process flow for scenario analysis that can be used to support mid-term SIDM for M&A. In the next subsection, the company’s dominant rationales for active involvement in the M&A market are elaborated on.

## **4.2. The company’s M&A rationales**

Understanding the company’s rationales for M&A helps in identifying the most prominent areas that should be addressed in scenario analysis. Based on the interviews, the main rationales are linked to the company’s growth and profitability targets. Growth was

emphasized as the main rationale by all interviewees, and the role of M&A in achieving the company's growth targets was described central.

*“Growth is the most important rationale for M&A for us. Particularly for some service domains, we have clearly specified growth targets, and we use all the tools available for us to achieve those targets.” - Head of Sales & Partnerships*

Interestingly, while raising questions about the requirements and/or expectations for synergy benefits, all interviewees considered them as secondary and more relevant for targets outside the company's core business areas. More specifically, transactions for which synergies were considered important were described to predominantly take place within various “support domains”, in which efficiencies can be achieved through stronger service offering or enhanced operational functionality. Overall, synergies were mostly considered an additional bonus arising from a deal, as can be interpreted from the following extract:

*“Growth, of course, is our main rationale. Synergy-wise ... they may be relevant for cases which are meant to support our core business and make it more profitable. But I'd say it's mainly growth.” - M&A Manager*

The Head of Sales & Partnerships offered similar insights on synergies while highlighting prevalent industry dynamics and pinpointing the size of the company as a limiting factor for achieving big efficiency gains through M&A transactions:

*“In theory, we do seek for efficiency gains as well, but it's less relevant in our service domain. In terms of our support functions, we might achieve efficiencies by strengthening our service offering in some areas; in which case it can become relevant and yet remain a smaller gain. We are quite a large operator, and so there may not even be such targets available in the market [which enable big efficiency gains]. - Head of Sales & Partnerships*

Even some characteristics of game theory were referred to during conversations regarding the company's deal rationales; the company's core business areas are dominated by a few large operators, and companies in the industry must know their competitors from head to toe for establishing capabilities to anticipate their behavior. In M&A, not only must the company consider potential outcomes of leaving a bid or proceeding with a deal, but the market dynamics force the company to think of potential consequences arising from

decisions not to be active as well. The Head of Sales & Partnerships illustratively explained this as follows:

*“We attempt to imagine what will happen if we don't buy; what it means in terms of competition or our market offering. All the time, we attempt to understand the whole service portfolio in each district. This is an industry dominated by a few large competitors only, so it's quite easy to conclude what may happen if we are not active.” - Head of Sales & Partnerships*

Consequently, while the company also conducts greenfield investment, the market dynamics seem to incentivize pursuing M&A for growth. Moreover, the market is heavily clustered around a few large industry operators and their engagement in M&A with smaller companies established for the sole purpose of exit by their founding entrepreneurs:

*“If one is to slightly exaggerate, the market functions in a way that it's the same people who always establish new companies, build good pipelines, and then sell them to bigger entities, and we are indeed interested in participating. We do greenfield as well and have been active in it. But as the smaller operators seem to know what they are doing and establish companies purely with an idea of an exit, it gives us the benefit of achieving growth through M&A. It's a systemic way of operating in this market; not only do larger operators seek for potential targets but companies are also established with the sole idea of an exit in mind.” - Head of Sales & Partnerships*

Whilst the deal rationales were discussed with the interviewees, the attitudes towards risk in M&A target selection were brought up. Generally, the company appears to have a somewhat conservative approach to M&A and emphasis is clearly given to the quality and efficiency of a potential purchase target's ongoing operations:

*“We favor targets that are already operating with high capacity utilization rates. There are also companies in the market with, let's say, 50% capacity utilization rates or which are otherwise just kicking things off. These targets entail more risks. We do look at them too but clearly favor established companies that have it all figured out.” - M&A Manager*

Still, the interviewees seemed to be interested in targets that operate in less known territories as well. Application of a more sophisticated scenario analysis could facilitate the inclusion of riskier targets in the “jar” of potential ones worth more scrutiny. Especially as the core area of the company is currently subject to changes, it could be beneficial for the company



to build more capabilities and courage to investigate or pursue targets in a wider market range. Through systematic, collaborative scenario analysis, the company could generate knowledge of unknown areas, and the risks and uncertainties associated with them could become less abstract and eventually more manageable. Interestingly, the idea of managerial flexibility (“real options”) was also touched upon amidst discussions regarding the use of scenarios for higher-risk targets:

*“It [investment into riskier M&A] just requires more analysis. We particularly look at the market and the demand in the area where a new unit is opening. It always helps the more sophisticated analysis we can conduct. And it's not only the demand-supply dynamics - we may also look at our current units in the same area to see if we can close some units in case there is overcapacity ... like if there is room for managerial flexibility.” - M&A Manager*

Particularly the company’s M&A Manager appeared to pay attention to potential managerial flexibilities available for specific M&A opportunities. Overall, long-term commitments as part of a deal were considered to significantly increase the value of managerial flexibility; long-term commitments increase the risks associated with a deal, and having options to adjust operations can decrease the impact of realized risks.

Next, more detailed descriptions of how the company evaluates potential targets and the risks associated with them are presented. Delving into these topic areas enables identifying unmet challenges in one of the most crucial parts of the M&A process, and which can potentially be addressed with scenario analysis.

### **4.3. Target and risk evaluation**

#### ***Target evaluation***

Based on the interviews, group-level strategy work forms the foundation for M&A target identification, evaluation, and selection. In a nutshell, group-level strategy gives the company guidance on their strategic direction and preferred growth areas, building the foundation for identifying attractive M&A targets:

*“The most important thing from my point of view is that we have a strategic fit. If we want to fit into one box, we don’t pursue M&A from another box outside of it. On one hand though, sometimes we might realize our strategy is headed into another direction and then adjust our position based on it.” - CFO*

Interestingly, the CFO found timing as one of the most crucial and yet difficult areas to master in bidding for targets. For example, the company may occasionally have “sleepy” deal interests, which may suddenly become highly relevant and timely:

*“We have a list of potential targets, and the most crucial and difficult question is often related to timing. Sometimes we start working on a case that has for long been on the list and suddenly becomes timely and requires rapid action.” -CFO*

Based on this, it can be expected that SIDM under time pressure can form a challenge for the company; finding a balance between comprehensive enough analysis and quick enough decision-making may be difficult. Importantly, in high-velocity decision-making contexts, the utilization of intuitive expertise may be a key element to prompt decision-making.

While the M&A target evaluation process was described as a conversation around the target’s strategic fit, the reality is often less structured in terms of identifying the most strategically fit options in the market. The M&A Manager used a hands-on example to describe the relatively unstructured process for the selection of potential targets:

*“In one of our recent cases, somebody heard a rumor about the company possibly being for sale, and then we just called them. ... It is not a very structured process. Also, there was another purchase which sort of just unfolded; our initial interest was in another area of the target's business, and then we ended up narrowing down the scope and purchased just a small part of the business to serve as a support function for us.” - M&A Manager*

### ***Risk evaluation***

To evaluate the risks associated with a target, the company utilizes traditional accounting methods, demonstrating strong preference towards quantitative risk evaluation. For more easily quantifiable risks, the company relies mostly on adjusted NPV and sensitivity analysis. As can be expected, difficulty in quantifying many of the risks in the company’s

contextual environment was acknowledged among the interviewees, and qualitative analysis is used to complement the evaluation.

*“Quite often particularly operative risks, such as salary harmonization, capacity utilization, or personnel availability, are accounted for in the calculations themselves. Some of the risks related to wider industry prospects are quite difficult to quantify.” - Head of Business Controlling*

Remarkably, the CFO distinguished the company’s M&A targets into two rough categories based on the source of potential value in a deal: (1) targets with value in established contracts and existing assets, and (2) targets with future potential. Based on this, categorizing the company’s targets into two groups should be considered in the construction; more comprehensive scenario analysis could possibly be assigned for targets with value in their future potential, or which are otherwise more complex, uncertain, and risky. Being mindful of both positive and negative risks associated with such targets was acknowledged during the interviews as well:

*“In general, there are two types of deals we conduct; those that concern targets with established operations and secure going concern, and others with most of the value embedded in their future potential. Naturally, the latter come with more risks; both positive and negative.” - CFO*

While it is possible to use scenarios for identifying positive risks as well, the overall grasp from the interviews was that focus should be maintained at identifying risks that may *adversely* impact the company’s performance post-merger. Next, the interviewees’ individual future perceptions are assessed briefly.

#### **4.4. Future perceptions of key personnel**

As described in the literature review, determining an appropriate approach for scenario analysis requires assessment of participants’ future perceptions, i.e., how predictable or chaotic individual scenario participants consider the future to be (Kosow and Gaßner, 2008). In the interviews, purpose of this part was to establish common ground regarding the following questions: *To what extent do you see the future as predictable and controllable? To what extent do you see it as chaotic and following random paths (“muddling through”)?*

Unsurprisingly, all interviewees had aligned views of the future and their own ability to impact future developments; sharing a sense of agency to what will or might happen in the future. Particularly good industry knowledge and ability to influence important contextual factors in the company's operating environment were considered to increase their collective ability to establish foresight and act on it. Some of the key driving forces in the industry were considered as highly predictable, and data regarding them abundant and available even from public sources. On the other hand, political and legislative factors were seen as less predictable as reflected by the Head of Business Controlling:

*“I think the future is controllable to some extent. In our industry, there are roughly two ends: on one hand, it is relatively easy to predict future service needs based on statistics regarding the Finnish population or workforce; however, the political and legislative sides are more difficult to predict and appear to be somewhat inconsistent.” - Head of Business Controlling*

On the other hand, the M&A Manager considered industry knowledge to be one of the main prerequisites for building accurate predictions. In general, the industry was considered stable and relatively predictable.

*“Within the work context, I think there are plenty of predictable things. ... Looking at the macro environment, some things are predictable to an extent, but then again, some changes may be more difficult to foresee. The better you know the industry, the easier it gets of course. Nevertheless, the bigger drivers in this industry are predictable and it's quite a stable industry.” - M&A Manager*

Interestingly, the Head of Sales & Partnerships approached the question more pragmatically and emphasized the importance of systematic ways of working for dealing with future uncertainty. Systematization was seen as a path to less “muddling through” and less stressful working conditions as well:

*“In my opinion, we can use systematic ways of working to perceive approximately 80% of the theoretical alternatives; I don't like the thought of just rolling up the sleeves and starting to work - I feel it's a fragile and burdening way of working.” - Head of Sales & Partnerships*

Overall, the interviewees had identified clear drivers that can be more easily predicted and others that may cause sudden changes in the operating environment, which underlined the need for systematizing the company's current scenario work. Importantly, one of the company's strong assets for scenario work is having a workforce with seasoned industry professionals; adding more cross-functional scenario work and structure to the process can enable better utilization of in-house expertise and enhance decision-making. In the following subsection, the company's current use of scenarios is examined in more detail.

## **4.5. Scenario analysis**

### **4.5.1. Elements in the current use of scenarios**

Next, conversations regarding the company's current scenario analysis approach are elaborated on. As briefly discussed in the beginning of section 4, the current use of scenarios in the company is mostly limited to M&A cases with higher-than-average uncertainty. The extent of analysis can be considered as relatively light and the process itself quite unstructured, still including valuable elements worth having as part of the more systematized construction presented later in section 5 of this thesis.

During the discussions on the company's current scenario work methodologies, relevance of scenarios was perceived somewhat inconsistently among the interviewees. Unsurprisingly, the difference was most apparent between interviewees who are hands-on involved in scenario analysis and others who are more involved in the last steps of preparing the investment proposal and/or business case construction, or in the decision-making itself. The company's CFO viewed scenarios as a tool increase the amount of information available for decision-making, particularly useful in uncertain contexts:

*"We do not use scenario analysis systematically, but we do use it as a tool when the amount of uncertainty is high. There are cases which build on sort of stable worlds, and then there are cases in which the world can go in many directions; in these, we have used scenarios. ... We might have an optimistic salesperson who thinks about the world in a certain way, thinking built around the case, and then we need to establish our own perception; we then evaluate the "realistic" scenario and evaluate risks against it. There are usually three different scenarios for each case." - CFO*

In contrast, the Head of Business Controlling, often involved in scenario analysis, described the use of scenarios on a more detailed level, emphasizing scenarios' usability for simulating operative risks. It became clear that analyzing the most obvious operative risks is considered "business as usual" within the company – understandably arising from the deep industry knowledge that has accumulated to the company throughout the years.

*"We comprise scenarios with different price assumptions and compare the assumptions to what happens in our model... We are good at testing operative risks. ... Scenarios allow for testing their [operative risks'] impact on a given project." - Head of Business Controlling*

The company's current scenario methodology was described on more pragmatic terms by the M&A Manager who is almost always closely involved in both the analysis and scenario generation for M&A. The company appears to favor quantitative analytical methods and to lean towards predictive what-if scenarios complemented with sensitivity analysis when required. More specifically, alternative scenarios are quantitatively produced by adjusting different parameters included in a DCF model, possibly followed by testing the project's sensitivity against small changes in its parameters:

*"I have a DCF model in Excel, and once a case proceeds far enough in the process, I calculate the DCF with three different scenarios; addressing how we estimate price and rent developments; and what would happen if the worst or best case would occur. I also do some sensitivity analysis, to test the impact of changes in certain parameters, like prices and capacity utilization; to test the sensitivity of the net present value for our assumptions." - M&A Manager*

Justifiably, the company does not use any sophisticated mathematical models for scenario generation. As the industry was deemed as quite stable, unreasonably complex mathematical models could over-complicate and delay the target evaluation process; unnecessary delay is avoidable, particularly when the deal opportunities can be highly time sensitive. However, the M&A Manager showed interest towards the use of probabilities to arrive at an expected NPV, still acknowledging the inherent difficulty associated with the evaluation of an event's probability:

*“In fact, I haven't done this, but in principle one could calculate the expected net present value. However, they [probabilities] are very difficult to estimate.”*  
- M&A Manager

On the other hand, it was acknowledged during the interviews that creating a scenario model with probabilities could be beneficial for decision-making under some conditions. Even if probability assignment can appear as a highly arbitrary step for practitioners, it can enrich communication and provide a way to express the level of confidence one has about a specific project. The CFO reflected on the methodology in their current scenario process:

*“The analysis techniques we currently utilize are relatively simplistic in terms of their mathematical attributes, and we do not have any structured methodology. However, the analysis could account for probabilities and the impact of a wider variety factors as well.”* -CFO

While the interviewees expressed interest towards the use of probabilities as part of scenario analysis, it should be noted that the process should be maintained simple for practical relevance and usability. Especially in terms of the level of mathematical sophistication, it appears that relatively simple accounting models serve the company's needs well. Moreover, given the current emphasis on quantitative information in the company, opportunities to enrich their scenario work could be found in scenario methodologies that entail qualitative considerations instead.

#### **4.5.2. Challenges in the current process**

During the interviews, discussions on challenges in the company's current scenario analysis application revealed some pain points that should be addressed in designing the construction. The discussed challenges related to an unstructured/unsystematic process, unclarity around responsibilities and communication between participants, ambiguity of the required level of preciseness for the analysis, and resource scarcity in terms of both headcount and knowledge. Overall, the process was thought of as scattered and blurry. The lack of internal knowledge and under-systematization of the process currently perceived within the company was elaborated during the interviews as follows:

*“In doing the scenarios, [lack of] internal capabilities [is the biggest challenge]. ... We have new people in the house, and the challenge is to determine who does and what, who says what to do, and who answers about the actions. ... And who steps in whenever there is an urgent situation; it's [a challenge] related to our process. This makes our scenario work more difficult, as we sort of "run" the things together, which is why we want to systematize them now. Scenario work can be one part of the process; when we have identified a potential target based on some criteria, then we can proceed to building alternative scenarios.” - Head of Sales & Partnerships*

On the more hands-on level of scenario work, particularly reaching a sweet spot between clear communication and the required level of preciseness for the analysis were seen as challenges. The M&A Manager perceived lack of time as part of the issue as well:

*“Well, it can be challenging to communicate these things as we have a lot of busy people here. If you come up with an idea about a scenario, it sometimes goes over to a detailed level. It can become difficult to push the underlying thinking through in a compact enough package... Also, as I work in this solo, sometimes it's difficult to determine the required level of preciseness [for scenario analysis].” - M&A Manager*

Systematization of the general process could provide the company an opportunity to establish more clear responsibilities and structured communication, and help tackle any inefficiencies in the process; also likely contributing to the lack of time, headcount, and know-how perceived by participants. However, it should be noted that too formalized a process should be avoided as it could lead to decreased communication flow and/or creativity.

Interestingly, during the interviews, the company's current process was most critically evaluated by the interviewee who had spent least time working for the company. This highlights the importance of having a pair of “fresh eyes” at times walk through crucial process flows and identify critical challenges associated with them. This may also help in identifying any collective bias and/or blind spots impacting the company's culture, processes, and decision-making.

Overall, as the extracts from the interviews here have demonstrated, the company's interviewees were able to name many challenges that further concretize the company's need for a more systematized scenario analysis process flow.



### **4.5.3. Scenario analysis process design**

The fourth part of the interviews revolved around the requirements for the construction. In the interview template, the phases were divided corresponding to the five-phase process description presented in the literature review. Like the process phases, the questions for each phase partially overlapped, and probing questions were included as typically with the semi-structured interview approach.

#### **4.5.3.1. Identification of the scenario field**

The fourth interview part began from the identification of the scenario field; that is, the purpose of the scenarios was determined to identify the appropriate scope and boundaries (i.e., the “scenario field”) for the analysis. A clear definition of purpose prevents the scenarios from becoming mere generalizations of vague future states (Kosow and Gaßner, 2008), and specific articulation helps narrow down the scope for the spheres that should be included in the analysis. As part of determining the scenario purpose, the three scenario typologies - predictive, explorative, and normative scenario typologies (see section 2.3.3. for more details) - were introduced to the interviewees, and a distinction was made between scenario analysis used for identifying risks and opportunities.

#### ***Purpose***

All interviewees had a relatively coherent view of the purpose that should be given to scenarios - the company wants to emphasize the identification of risks associated with M&A. In contrast, identifying opportunities (or “positive risks”) was considered a benefit possibly enabled by scenarios as well, but this perspective was less frequently referred to during the interviews. Interestingly, understanding the proportions of risks and opportunities for a target was considered valuable:

*“I think it’s more about risk evaluation; like a standardized model to put risk and opportunities into proportions. For example, if there is a target company with five units and we think two of them are good, one is really bad and the rest of two are somewhere in between, we should have something to base our decisions on ... It’s not like we are throwing a dice now either, but it feels like*

*nothing can be extracted from the case to determine the relation between risk and reward. I think we could assign weights to those [differently evaluated units], and systematically write them into narratives to create a way to make the evaluation objective and use it as basis for our decision-making.” - Head of Sales & Partnerships*

While the Head of Sales & Partnerships approached the purpose of scenarios from a risk evaluation perspective, the CFO highlighted the role scenarios can play in risk management too. For successful risk management, the company should acknowledge the limitations of predictability they must cope with and aim at proactively mitigating risks instead of passively waiting for them to realize:

*“I think it’s about risk management; it’s about questioning the scope of predictability and understanding whether we may proactively do something to mitigate and overcome those risks instead of waiting to see what happens. This applies to positive risks as well.” - CFO*

The statement by the CFO underlines the interviewees’ collective approach to the future in general, emphasizing the importance of being critical towards its predictability but acknowledging that possible future paths can also be impacted by knowledge and adequate tools.

As the purpose of the scenarios was narrowed down to risk identification - without the complete exclusion of “positive risks” - the nature of factors that should be included in scenario analysis was discussed too. Based on the interviews, factors related to specific operative risks were highlighted. As previously noticed, the company’s SIDM relies heavily on quantified information, and scenario analysis should not become an exception; the analysis should continue to include financial modeling that facilitates the quantification of information wherever reasonable. Particularly information related to the operative risks (e.g., personnel, property, capacity utilization, pricing...) can, and should, be quantified as part of the scenarios. Furthermore, as quantified information is held the most valuable for the company’s SIDM, factors in the company’s contextual sphere may not fit into any standardized scenario models. Nonetheless, the inclusion of such factors could be considered on a case-by-case basis as part of the scenario process.

*“Financial information is highly relevant; it forms the "hard" base and know-how for us. In this sector, we look at capacity utilization rates and personnel structure as well as availability - these are the factors that make up the profit in our business. Analysis of the prevailing situation in various districts is important; like how much they [in a specific district] want to produce [similar services] themselves and how much they want to purchase. ... To understand their strategic view ahead to the future. Sometimes what's said in the strategy is one, people say the other, and what they do is something else. It is not easy at all.” - Head of Sales & Partnerships*

### ***Responsibilities***

After defining the purpose for the scenarios in the interviews, more pragmatic aspects regarding top-level process ownership, division of responsibilities and more detailed boundaries for the scenario field were laid out. While discussing the main responsibilities for the process, the inclusion of other personnel from different functions was suggested as well.

In terms of top-level ownership, all interviewees agreed it should be held on the company's leadership level; even if the process flow was to unfold on lower levels in the company's hierarchy. This perception was collectively rationalized with the strategic and monetary significance of M&A for the company, highlighting the importance of having decision-makers involved in the process particularly responsibility-wise. Based on the interviews, the Head of Sales & Partnerships appeared as the most logical leadership team member to take ownership over the process, especially because of their supervisory role for the M&A Manager.

*“I think the ownership should be on the leadership level. In M&A, the responsible person would be the Head of Sales & Partnerships.” - Head of Business Controlling*

Importantly, the Head of Sales & Partnerships was on the same page regarding their role in the process, in any case holding the responsibility over the process at leadership level:

*“In short, I think it should be me. M&A is highly significant both as a contributing factor to the realization of our strategy and as monetary investments. ... I think ownership over the scenario process should be in the leadership team. Within the leadership team, the alternatives would be me, the business function, or the CFO who has the responsibility over the general investment process.” - Head of Sales & Partnerships*

On the other hand, all interviewees agreed cross-functional collaboration would be essential for comprehensive scenario work, and indicated the extent of required collaboration should be determined case-by-case. The functions suggested to be involved in the process were the sales function (including M&A managers), business function, and financial function including business controllers and risk experts. The contribution of different functions may be required in different scenario phases depending on the required knowledge and input.

The sales function’s input was considered as highly central as the company’s sales analysts possess the most accurate and timely information regarding the market situation, competition, and developments in various business districts. Input from the business functions (i.e., “the field”) was called for as the personnel working in the field would be involved with the project on the grassroot level. The CFO also emphasized the importance of assigning responsibility over the scenario outcomes to the business function; active contribution in the scenario process would likely increase the business function’s commitment and sense of ownership in the project. Additionally, some mentions about the HR and legal functions were also brought up, but the role of these functions would become essential later as part of the due diligence phase in M&A. Hence, they would not preliminarily be included in the scenario process.

*“From our organizational functions, I think the sales and M&A function, financial function including risk experts, and business function should be involved in the scenario process. However, the contents of and the responsibility over the scenarios should come mainly from the business units; in the end, they will be the ones executing the project.” - CFO*

While the CFO discussed the crucial role of the business units in scenario formulation, the Head of Business Controlling considered the roles from a slightly broader angle; emphasizing “case-by-case” evaluation of appropriate contributors. Particularly for the part including financial modeling, the controlling organization may also be a valid contributor:

*“The people responsible for the operations, people in charge of M&A [should contribute]. ... And if we look at financial modeling, then why not our business controlling organization as well. I’d say it depends on the scenario we are working on; for example, whether we are working on scenarios that require input regarding changes in the whole industry or scenarios that require information of price signals from the field. Like in strategy work, I think contribution always pays off.” - Head of Business Controlling*

### **Boundaries**

Finally, more detailed boundaries for the analysis part were discussed, addressing both the “scope” of the analysis and the criteria for M&A targets that should be subject to scenario analysis. Based on the prior insights in this section, scenario analysis would mainly be used for risk identification, and quantifiable information should be prioritized. These insights naturally limit the scope of the analysis to cover more of the transactional sphere of the company and less of the contextual sphere; thereby comprising of factors related to competitors, regulatory organizations, clients, and suppliers, among others.

To address which potential targets scenario analysis should be applied to, discussions revolved around the possibility to establish some predetermined criteria and/or price thresholds that could be used as guidance. Interestingly, responses to this were not uniform, and alternative viewpoints seemed equally justified. Some deliberations regarding possible target/case criteria included, e.g., selection of targets subject to higher uncertainty and targets of significant size. The targets subject to higher uncertainty could contain targets with less established operations and uncertain prospective value, or targets in less familiar business areas.

On the other hand, as perhaps the most central person involved in the target evaluation phase, the M&A Manager suggested the analysis would be beneficial for almost all cases irrespective of their estimated deal value per se. Still, the M&A Manager maintained that considerations for the target’s level of risk - particularly tied to any long-term commitments arising from the deal - should be considered in determining the required depth of analysis:

*“In my opinion, all [should be analyzed with scenario analysis] especially as*

*many of our potential targets come with long term commitments. The purchase price may be low, but we might be committing to a multiple-year agreement, so that makes it quite a big decision.” - M&A Manager*

While this statement seemed well justified, it became clear that the personnel dedicated to M&A are timewise relatively squeezed, which increases the appeal of having established some pre-determined criteria to filter out the smallest and least risky targets. By this, the company can avoid excess resource expenditure on scenario analysis and focus the in-depth analysis on more uncertain targets. Nevertheless, the company will most likely continue making case-by-case judgments of the need for scenario analysis and the extent of it.

Possibly, all targets could be analyzed to some extent, and additional explorative methodologies could be included for the more uncertain, complex, or riskier targets. Moreover, the categorization of M&A targets into two different types suggested by the CFO (see section 4.3.) could be used for determining the appropriate level of scenario analysis:

*“I like the thought of having certain criteria. [As discussed earlier], there are roughly two types of M&A cases, and I would apply scenarios to those with value residing in their future potential because of their lower level of predictability. Scenarios for those should cover both internal and external factors. The size should not necessarily be a defining factor.” - CFO*

The CFO’s perception was also supported by the Head of Business Controlling. However, the Head of Business Controlling also indicated that the transaction’s size relative to the company’s ongoing operations could be another defining factor while acknowledging that scenario analysis may be useful even for smaller targets under scrutiny whenever the evaluated target lies outside the company’s core competencies. Such targets naturally entail higher perceived levels of risk and uncertainty and addressing them through more extensive scenario analysis may help raise important questions and detect critical information otherwise more easily overlooked. The power of scenario work for provoking thoughts around the “unthinkable” can become a major asset in less familiar territories.

*“For the smallest transactions, scenario work is not so important. The size of the potential deal compared to other businesses should be a criterion. But even if the planned case is smaller, and in a domain we are not actively operating in yet and do not have the knowledge, then they can be useful. So cases outside our core competence.” - Head of Business Controlling*

However, it should not be forgotten that while scenarios can increase the *sense* of knowledge for contributors, they are still merely narratives on possible outcomes, and the quality of input for them is vital. The company might benefit from the use of external consultants whenever approaching a new domain.

Finally, to concretize the impact the company expects scenario analysis to have on their decision-making, the interviewees were asked to speculate on some previous M&A case for which scenarios might have been useful but were not utilized. Overall, the interviewees agreed that scenario analysis could have guided the company's SIDM in various prior cases, possibly leading to different decisions too. Importantly, as scenarios have been used mostly for analyzing risks and project sensitivity in the company, their use has led to higher conservativeness in estimations used for target and risk evaluation. In some occasions, this increased conservativeness may have caused the company to lose a bid for a target in a competitive bidding:

*“There have been cases which have initially been considered quite rosy, but scenarios have raised concerns about their risks and impacted our final valuation. Sometimes, we may have applied more conservative estimates and consequently lost a bid against our competitor.” - CFO*

In the other end, some risks may have gone unnoticed with lack of scenario analysis or its level of systematization so far. The Head of Business Controlling remembered a case which was not evaluated using scenario work, and suggested scenarios could have improved their decision-making:

*“One case comes to mind ... had we done scenarios back then, covering the service network planning and the economic situation in the district, it may have impacted our decision-making through highlighting project riskiness.” - Head of Business Controlling*

#### 4.5.3.2. Identification of key factors

After P1, following the five-phase process description for scenario analysis, P2 concerns the identification of key factors that are included in P3 analysis. For key factor identification, the aspects that mostly impact the attractiveness of any M&A target most should be identified. Unsurprisingly, the opinions regarding this varied among interviewees, and the specific nature of a target seemed to be a central consideration. Beginning from the leadership level and aligned with the prior descriptions of target evaluation, strategic fit was named as the most important factor building up the attractiveness of any target:

*“The rationales are based on strategic fit. First and foremost, it should be assessed. Then comes the value that can be added. Thinking of value; it could be growth, profitability, or something else - it depends on what we are going to pay for.” - CFO*

While strategic fit is highly important as growth and profitability targets can be reached through projects that fit group-level strategy, considering strategic fit is not at the core of scenario analysis. Instead, the existence of strategic fit should be a prerequisite for any target to proceed to the pipeline of potential M&A targets; not a criteria for scenario analysis but a criteria for any consideration towards a target to begin with.

More detailed and hands-on descriptions of characteristics that make up an attractive M&A target were shared by the Head of Business Controlling, clearly valuing financial profitability and growth prospects. Particularly EBITDA multiple (i.e., enterprise value in relation to the target's EBITDA) was named as the most important factor as it puts the price tag on a target in proportion against its earnings. Also, the inherent nature of capital investment and the balance between risk and reward were addressed, suggesting that some risk-taking be required for reaching growth targets:



*“For me, the most important factor is the EBITDA multiple. If the multiple is “too long”, then the target loses attractiveness. The range depends on what we are purchasing. ... Surely there are many other factors as well, especially if we attempt to purchase something aligned with certain strategic choice; if we decide to pursue aggressive growth in a sector we are not strongly present in, we need to be prepared for taking risks too. On the other hand, sometimes we execute transactions meant to support the core business, and the evaluation is quite straight-forward then.” - Head of Business Controlling*

Considerations in terms of the balance between quantitative and qualitative factors for the evaluation of target attractiveness aligned with prior empirical findings, presenting clear emphasis on quantitative analysis. However, the CFO still highlighted the importance of a story in the scenario work:

*“In my opinion, a combination of qualitative and quantitative information would serve us the best. A story should be unfolding as the scenarios are worked out. For example, even for what-if questions, there is always some story present. Then we simulate the alternative options.” - CFO*

In general, scenarios are typically textualized at least to some extent, and a storyline even for predictive what-if scenarios can be established irrespective of the emphasis on quantitative factors in the process. Naturally, the collaborative work that precedes quantification, quantification itself, and the creation of scenario narratives usually overlaps; a narrative is always behind numbers, even if not explicitly textualized. In the company, quantification was above all regarded as a vehicle to validate underlying narratives:

*“We build an understanding with narratives and then validate through quantified facts.” - Head of Business Controlling*

During key factor identification, different variables, trends, developments, and single events central to possible project outcomes should be selected, and data around them should be collected. As previously discussed, the known, most prevalent, and simultaneously more controllable risks in the company’s core business cluster around operative factors in the transactional sphere. The less controllable and more uncertain risks include contextual factors, such as political and legislative forces. However, even factors in the transactional sphere can become more uncertain and at least subjectively riskier for targets outside the company’s core domain as the level and quality of information for these can be much lower.

During P2, identifying key drivers of uncertainty, risk, and value in the environment should be prioritized. For example, even small changes in regulation may radically change the company's prospects in some districts. Also, analyzing targets in less familiar territories may require more extensive environmental screening and broader thinking compared to targets with familiar operative risks that can be routinely modeled in existing DCF models. The Head of Business Controlling summarized the main considerations for key factor identification in the following way:

*“Simply put, the drivers for demand and the availability of personnel are the key parameters. In specific fields, we also need to consider the legislative side.” - Head of Business Controlling*

Nevertheless, critical factors should be considered and chosen case-by-case as differences in the most important parameters may present. In practice, the key factors could be chosen from a list of standard parameters while leaving room for the inclusion of possible “outlier” events and other adjustments if required. In essence, the parameters should be chosen for further analysis based on the level of their potential impact on deal outcomes and the level of uncertainty associated with that estimated impact.

*“This [which key parameters to apply] should be determined case-by-case. First, we need to identify the most relevant areas of impact for each case, after which we can determine the specific variables with higher uncertainties that should be included.” - CFO*

#### **4.5.3.3. Analysis and scenario generation**

As the key factors have been chosen from the standard list, possible outlier events and other unique factors identified, and the factors left for further analysis chosen based on their a) estimated impact and b) uncertainty of that impact, data collection and analysis should take place. As part of scenario analysis, data collection can be executed through various methods, such as desktop research, workshops, surveys, and expert interviews. Even informal hallway discussions can be a valid source of information. P3 phase usually also requires some creativity, and intuitive judgment can be central to the analysis (Kosow and Gaßner, 2008). To address this during the discussions regarding P3 for the construction, the role of intuition

in the company's SIDM process was reflected on. The inevitable role of intuition in forming opinions and stances was acknowledged, but some interviewees also expressed reservations over the word "intuition", possibly because of a slightly negative connotation with the word.

*"I think it plays a part in the phases; foresight and predictions cannot be formed or managed solely based on historical data. More often the phases rely on the beliefs and assumptions one has about the future. However, I think the word intuition has a "woo woo" feel, and I think "taking a stance" better captures the meaning. ... It is based on experience and understanding of what the future could look like. Sometimes though, if there is a specific target, such as growth, one may start to seek for it and suddenly see it everywhere. Scenarios themselves bring us the opportunity to create alternative descriptions and facilitate communication." - CFO*

As already established, the company has experienced professionals working in different functions, which forms a major asset for the company. Even the intuitive aspects in the SIDM process were taken as "derivatives" of the company's in-house knowledge and expertise. Importantly, even while the interviewees emphasized the role of facts and validation through quantitative modeling in their SIDM, subjective judgments are always present in scenario analysis.

Utilization of scenario narratives was considered a platform to communicate the knowledge-based intuitive judgments and stances taken during the process to others. Simultaneously, using scenario techniques can help in sanity-checking various assumptions made during P3 and hedge cognitive biases, which can adversely impact SIDM. Building credible scenario narratives requires that the logics behind different developments are clearly articulated as part of the process, and their articulation can pinpoint any fallacies arising from the more intuitive reasoning. Importantly, it was not omitted during the interviews that pure reliance on intuition and prevailing knowledge may lead to blindness over other possibilities and cause organizational inertia:

*"For better or worse, we have a lot of people in the organization who have worked in this sector for a long time. They have a good grip on things, but it might simultaneously cause blindness to certain things. Our aim is to go through the cases by validating [intuitive thinking] in one way or another. Then there is this; if we have four options built into four different worlds, we should determine which one we choose to believe in. ... I would strive for better understanding of perceived probabilities. Especially if we have been*

*working on a case for a long time, people may start to push it as a "must have" no matter what the price tag ... you sort of get blind and then you just want to believe in the best case. But we should maintain objectivity all the way through." - Head of Business Controlling*

Furthermore, while intuitive logics are an essential part of P3, the leading idea within the company is that each assumption that is being made should be adequately justified; for it to “withstand daylight”:

*“Intuition has an impact [on our analysis], but we do look at everything thoroughly; sometimes the people with wider industry experience may make decisions based on intuition, but homework needs to be done anyway.”  
- M&A Manager*

### ***Collaboration***

Like the previous phase, P3 was also found as a proper phase for cross-functional collaboration. Insights from business functions were seen as crucial as the personnel working in the field have more pragmatic views of the ongoing developments particularly for the near future. The personnel in the field were also considered to possess majority of the information required for the key factor analysis and scenario generation.

Another important incentive for cross-functional collaboration during P3 was the positive effect it could have on personnel commitment during later project execution phases; the commitment of the business function is the basis for successful M&A integration and synergy realization, for example. Cross-functional collaboration was thought to be particularly critical for analyzing any interrelationships between factors and preparing the estimates/ranges for them in different scenarios:

*“For example, for analyzing the impact of various factors, I think the M&A function together with the business function should prepare the estimations. This way they can be engaged, and commitment is higher; it would not make sense to just conduct the evaluations within the financial function ... just to have the people actually engaged with the projects later come in and flag things that were not considered thoroughly in the scenarios.” - CFO*

On the contrary, more detailed quantitative modeling should be assigned to specific people in the company as the task requires different kind of analytical expertise and a more structured approach. The company's M&A function is responsible for preparing a comprehensive business case for a target, and quantitative scenario modeling can be embedded to the business case generation. Accounting for this, the Head of Business Controlling emphasized the role of the M&A Manager in this:

*“For quantitative analysis, I think the M&A Manager should do it as part of the business case construction. I have to say, we have a lot of cases in which they are the only person working on the case.” - Head of Business Controlling*

As described as part of section 4.5.1., the company currently utilizes DCF-based models to simulate various future scenarios for potential targets and complements them with sensitivity analysis. Being asked about their interest to use more complex, systematic-formalized techniques as part of scenario analysis (e.g., CIA), the interviewees expressed a more general need to understand the impact an M&A deal could have on the company - both if completed, or if abandoned.

However, considering this would likely be inconvenient to be included in the scenario construction. Instead, assessment of this could take place after scenario analysis and as part of making the final investment proposal and/or decision.

*“I think we at least always need to identify the impact of decisions on our competition and on our own service offering. In this game, there is also the aspect of what happens if we do not purchase ... then who does, and at what price. There are plenty of possible futures, and what it means for us to buy or not to buy should be assessed.” - Head of Sales & Partnerships*

#### **4.5.3.4. Scenario transfer/learning**

Finally, scenario transfer takes place at the end of the process. Within this thesis, P5 covers the phase following scenario generation, during which opportunities to capture organizational learning are searched for, investment decisions are made, and personnel commitment is built and maintained through various actions.

## ***Organizational learning through scenarios***

Pondering upon the possibilities for organizational learning in a scenario-based context, retrospective review of prior scenarios and mirroring the insights against decisions can function as a channel for continuous learning. Using scenario reviews can enable the company to develop its capabilities to identify valuable information from their analyses, possibly indicating areas of strength and weakness in forming assumption for the scenarios. In other words, the company can learn whether the scenarios assumed realize or not and to what extent, and which factors may have eventually driven them. Scenario reviews can also enable the company to harness prior scenarios for other M&A targets as well.

In addition, formal documentation of the insights could facilitate more efficient institutionalization of organizational learning, which could positively contribute to the robustness of the company's knowledge base, decreasing its fragility against personnel turnover. However, there were differences in the interviewees' opinions regarding the extent to which scenario reviews should take place. The Head of Business Controlling suggested conducting reviews for every case that has been analyzed using scenarios:

*“The smart thing to do would be to do this for each M&A case, systematically; not only to evaluate how the case has performed economically but also to see how certain assumptions have landed ... to try and learn which areas we are good at making assumptions in and which not. From a learning perspective, we should do our homework.” - Head of Business Controlling*

Nonetheless, resource scarcity in the M&A function creates some boundaries for the frequency of possible scenario reviews. Still, the M&A Manager did not refer to a specific number of cases that should be subject to review but focused on preferred review intervals (e.g., per quarter or annum), eventually suggesting annual reviews:

*“Well, if I looked back to last fall, perhaps some understanding could be extracted of why we made specific right or wrong assumptions. But we haven't done this. Due to resourcing, I think maybe once per year would be a good frequency.” - M&A Manager*

Importantly, a long enough time horizon between the scenario analysis and the review would enable gathering more data and increase the trustworthiness of the comparison between prior assumptions and reality. For M&A cases, even a one-year span may be relatively short as the analysis may take place months before the actual deal. Because of this, it can be reasonable to consider even as long as a two-year lag between the generation of the scenarios and the reviews.

Additionally, particularly in M&A, the actual performance during the first year of operating as a merged entity may not accurately reflect the long-term outcome; post-merger integration is a long and complex process, and it may take time for the dust to settle. However, the length and the complexity of the integration process depend on the level of integration looked for in the first place.

As an argument in support of the M&A Manager's suggestion of annual reviews, the CFO suggested scenario review itself could occur annually but with the inclusion of M&A cases completed approximately one to two years before. Overall, if the reviews were to be conducted annually, they could be tied to a more comprehensive evaluation of strategic performance undertaken within the company:

*"I think [reviewal could take place] at least annually. In our organization, we look back each year and reflect on the scenarios that were painted out and whether they were realized or not. I think reflective learning would enable a more frequent use of scenarios. The reference should be large enough for going back to those scenarios, and during the reflection, one must acknowledge that a specific risk or a scenario may have been relevant in that moment and lose its relevance when considered today. We should also see if there is some new information that can be useful." - CFO*

During the conversations around scenario reviews and organizational learning, some discussions over the principles for documenting scenario work were initiated. The company currently has some procedures in place to ensure proper documentation and archival of the conducted work, but systematization of the procedures may be beneficial:

*“We have identified that we have information all over the place, some of which is up-to-date and some of which not. Clearly it does not work so that we go back to it just when needed or update the information whenever there is a situation at hand. We should have this assigned to somebody, to keep the market and competitor analysis up to date.” - Head of Sales & Partnerships*

Similar concerns were previously raised while discussing the challenges related to the M&A evaluation process in section 4.5.2., and particularly vulnerability to personnel turnover was seen as a threat. Moreover, lack of clarity around responsibilities in the process phases extends to smaller tasks as well, such as the archival of information. Essentially, proper documentation of insights could help the company in maintaining valuable knowledge in their possession despite changes in personnel.

### ***Communication***

While the scenario reviews were considered as crucial for efficient learning, communication is also central to scenario learning. Scenario analysis can be used to enrich cross-functional communication in the company and increase the informational value in investment proposals presented to decision-makers. In essence, transparent scenario-related communication could facilitate sensitivity towards smaller changes in the operating environment as well as enhance personnel commitment throughout project execution and post-merger integration phase.

However, despite acknowledging the potential benefits of openly communicating scenario insights, the interviewees also pointed out that communicating wider scenario narratives can be more conveniently tied to group-level strategy communication. Group-level scenarios with broader contextual considerations and long-term impact are not within the scope of this thesis.

*“It could be useful if everyone had a perception about what we think about the macro environment; for example, the upcoming changes impact our industry a lot, and these affect our decisions all the time. ... Having a shared vision and talking about it could be useful. Having looked at the presentations about strategy, there has not been any specific scenarios whatsoever about the macro environment; but these could be interesting to have, and then we could see how the anticipations turn out.” - M&A Manager*



For specific M&A targets and investment proposals, scenarios can facilitate more efficient communication between the personnel involved in the business case construction and the personnel working to execute the project. However, wider communication of scenarios would require critical assessment and planning. Particularly within the context of M&A, the sensitive nature of the materials was also a concern. Because of these previous reasons, a broader framework for scenario communication remains outside the scope of this thesis.

*“On one hand, I think we are sharing too little information, but on the other, there are some challenges related to this. M&A cases are often quite sensitive in their nature and especially in terms of purchase prices.” – CFO*

#### **4.5.4. Summary of empirical findings**

The interview findings reveal that the current scenario analysis process involves creating what-if scenarios for M&A targets on a case-by-case basis, relying heavily on broad in-house industry expertise and focusing on risk identification within a DCF model. However, the process is scattered, unsystematic, and informal, with unclear ownership, responsibilities, and communication channels. There is also limited training and expertise among contributors, and possible overreliance on quantitative data at the expense of qualitative insights. Additionally, the documentation and review of scenario analyses are inconsistent and information of them is not always easily accessible. To address these issues, there is a need to systematize the process with clearly defined phases, assign clear ownership and responsibilities, enhance cross-functional collaboration, integrate both quantitative and qualitative elements, and ensure consistent documentation with annual reviews.

Below, table 5 summarizes the company’s current scenario use and highlights the main challenges and considerations for the construction designed for the company in this thesis. The construction is presented in the following section.

<b>SUMMARY OF EMPIRICAL FINDINGS</b>		
<b>Current scenario analysis</b>	<b>Challenges</b>	<b>Desired construction</b>
<ul style="list-style-type: none"> <li>• What-if scenarios, often created of three (3) different future states</li> <li>• Generation in an ad hoc manner, “on-the-go” for riskier and more complex M&amp;A targets (case-by-case)</li> <li>• Broad in-house industry expertise to build scenario assumptions on</li> <li>• Heavy focus on risk identification and quantified information built into a DCF model</li> <li>• Information stored in various places, no continuous scenario reviews</li> </ul>	<ul style="list-style-type: none"> <li>• Scattered, unsystematic, and informal process flow</li> <li>• Lack of clarity around ownership, responsibilities and communication</li> <li>• Partially limited training and expertise for scenario analysis among contributing personnel</li> <li>• Possible overreliance on quantitative data, oversight of qualitative insights</li> <li>• Inconsistent documentation and review of scenario analyses against occurred reality</li> </ul>	<ul style="list-style-type: none"> <li>• Systematization of the process with clear phases and content</li> <li>• Assignment of process ownership and responsibilities</li> <li>• Enhancement of cross-functional collaboration and increased business function commitment</li> <li>• Integration of quantitative and qualitative elements</li> <li>• More consistent documentation and annual scenario reviews</li> </ul>

**Table 5. Summary of the empirical findings for the construction.**

## **5. THE DESIGNED CONSTRUCTION**

This section outlines the designed construction for a more systematic scenario analysis process flow, building on the insights presented in section 4 and incorporating others from the literature review in section 2. The construction is phased similarly as the scenario process phases described earlier and integrates some scenario techniques to meet the information requirements for effective risk identification facilitated by scenario work. A summary of the construction can be found in Table 6 at the end of this section.

### **5.1. General objectives and commentary**

As already discussed, process systematization was considered important as it is anticipated to help clarify personnel responsibilities, increase accountability and commitment, and smoothen communication between different collaborators. As a “bonus”, systematization may also facilitate more efficient scenario learning given that appropriate documentation of the work is completed. During the hands-on process phases, collaborative work is expected to provoke outside-the-box thinking and help perform more considerate risk identification. Furthermore, because the primary purpose of the scenarios for M&A for the company is to improve risk identification capabilities, the scenarios should mostly revolve around risks both within the company’s contextual and transactional spheres. The scope of the analysis should be based on the nature of the target, and therefore be determined case-by-case.

As mentioned in section 2.3.5., implementing a hybrid approach comprising multiple scenario techniques is common in practice, and quantitative and qualitative methodologies can be combined. In this thesis, the construction is built on components from various scenario typologies and techniques, with emphasis on quantified information according to the company’s preferences. However, the approach merges systematic-formalized techniques with some principles of Intuitive Logics, the latter of which is commonly used by leading global corporations such as GE and Royal Shell. Moreover, the company's current use of what-if scenarios and simulate alternative outcomes is integrated into this approach. In this section, the main contents of each phase are described and rationalized in more detail.

As a general observation, it should be noted that scenario analysis does not necessarily provide guidance on how to deal with the identified risks per se but rather directs attention to critical uncertainties and possible outcomes of risk realization in specific contexts.

## **5.2. Description of the process flow**

### **5.2.1. Scenario field identification**

#### ***Objectives and responsibilities***

In defining the scenario field, the purpose and concrete objectives for the scenarios should be outlined, responsibilities assigned, and the scope and boundaries for the analysis determined to ensure smooth workflow and clear vision for the desired output. As mentioned earlier, the purpose of scenarios for the company is mostly linked to risk identification; still, it is advisable to articulate explicit objectives for the scenarios for each single case because no target or scenario setting is ever identical. Clear expression of objectives helps in defining the overall scope for the analysis.

Once the objectives for the scenarios are clear, ownership and responsibilities should be assigned for each task in the process. The Head of Sales & Partnerships is recommended to adopt the overall process ownership and oversight, given their supervisory role over the M&A Manager. Cross-functional collaboration throughout the process should be facilitated, and the process owner should be responsible for dividing responsibilities among different collaborators. As a rule-of-thumb, it is advisable to maintain a maximum of three to five people as contributors to maintain uninterrupted communication, protect sensitive information, and manage resources effectively. In general, the collaborators should include at least the M&A manager, sales analyst(s) with market expertise, business function personnel involved in project execution, and business controllers if additional support for scenario generation is required. The tasks for each collaborator are elaborated on in more detail in their respective phases below.

In P1, the scope and boundaries for the analysis should be established. Because of the company's preference for quantified information and the mixture of predictable and malleable future perceptions within the company, the analysis should maintain a predictive tone while incorporating some explorative elements that facilitate more creative thinking. The explorative elements can be utilized particularly for targets requiring more comprehensive analysis, which should be determined on a case-by-case basis.

### ***Target categorization***

To clarify the case-by-case determination, the company could benefit from a standardized system for categorizing different M&A targets. During the interviews, the company's CFO seemed to support the idea of establishing criteria to determine the need for scenario analysis to begin with. As an example, the targets could be categorized based on the source of value in a hypothetical deal (i.e., existing assets versus prospects) or the level of knowledge possessed of the target, weighed against the level of uncertainty associated with the case. If the categorization of targets is conducted in this manner, it is recommended that the M&A manager take responsibility over presenting these aspects to decision-makers because the M&A Manager is likely to be the most familiar with each M&A opportunity. However, separate validation for the categorization itself is unlikely to be required, and if this is true, the M&A Manager can use their expertise and judgment to initiate the scenario process in the extent they see fit.

As some of the interviewees also advocated for analyzing *all* potential targets with at least some scenario techniques, a less binary approach for target categorization can also be used, with the inclusion of multiple criteria that need to be justified by the evaluator. This could include, e.g., assigning scores for factors such as level of risk, relative deal/target size, level of industry unfamiliarity, and other factors related to market dynamics. Market dynamics can be important particularly in competitive bidding contexts as noted in section 4. For decision-making, a rule-of-thumb for the overall score could be determined, e.g., targets that receive scores above a threshold should be analyzed using in-depth, explorative scenarios and those that fall below the threshold should be analyzed using less extensive scenarios. Understandably, assigning a numerical value for each attribute is a purely

subjective task, and the values given to each attribute represent merely the judgments made by the person performing the task. Consequently, each score should be thoroughly justified, preferably in a form that can be sanity-checked by others if deemed important.

In essence, most of the value in the categorization exercise is likely to arise from having a standardized “system” for determining the scope for the analysis and the encouragement to think of all the listed attributes from various angles. Also, using numbers for the categorization can assist in comparing targets prior to their further analyses. Overall, using target categorization can enable the company to identify the “safer” targets for which what-if scenarios are adequate and the “riskier” targets for which additional scenario exploration is preferred.

### **5.2.2. Key factor identification**

Once the scenario field has been determined, the key factors for the scenarios are defined. Cross-functional collaboration should be at the heart of this phase; the M&A manager, sales analyst(s), and the business function should work in close cooperation during P2. The need for involving the business function arises from the central role the “field” has in the post-merger integration processes. In general, the composition of the collaborating group should vary depending on the specific target, and the responsibility for composing the appropriate group should remain on the process owner (Head of Sales & Partnerships).

For safer M&A targets within familiar domains, P2 may not be required as the key factors are already much known. The key factors for these targets likely consist of factors within the transactional sphere, such as factors related to competitors, regulatory organizations, clients, and suppliers. However, additional insights for the scenarios composed for these targets as well can be derived using traditional business analysis tools (Huss and Honton, 1987), such as SWOT and Porter’s Five Forces. The risks in these spheres are mostly operative and at least partially controllable to the company. Based on the interview findings in section 4, some critical factors to be accounted for in the company are price movements, capacity utilization rates, district and municipality planning, competitor behavior, the length of related commitments, options for managerial flexibility, workforce availability and salary level, and population age distribution.

On the contrary, more comprehensive scenario analysis may be beneficial for the riskier deal targets. In this case, additional information about the target company, its market and operating environment should be gathered to determine the key factors. According to Börjeson et al. (2006), workshops and meetings have been found as efficient for facilitating creative, collaborative work, and these techniques can be useful during both P2 and P3 in the scenario process. Overall, in accordance with the principles of Intuitive Logics for riskier targets, P2 and P3 should cover both transactional and contextual spheres. While the key *transactional* factors can be identified using the traditional analytical techniques, identifying the *contextual* factors may require using a wider pool of information and resources, including literature, information services platforms, public databases, and/or external consultants and analysts. Contribution of outside experts can increase the quality of the information used for scenarios and decrease the risks of biased interpretation.

Once the key factors within the predetermined scope have been identified, the least critical factors should be dropped out from the analysis to restrict the number of variables included, particularly if/when there is plenty of identified factors and no software program is available for use in quantitative scenario generation. Unnecessarily high number of variable combinations might complicate consistency checking for scenario generation unless software solutions can be used. To assess the relevance of each factor and their impacts on one another, the company could benefit from using an influence matrix as a tool. The matrix can assist in evaluating the relationships between different key factors and in prioritizing them, based on both their *active* impact on other factors and on their sensitivity for being passively impacted by other factors.

On top of identifying the less relevant factors, one benefit of applying the influence matrix technique can be attributed to the exercise of filling in the matrix itself; its use can encourage critical thinking in terms of each factor and without isolation, which serves for the later phases of scenario analysis. However, a prerequisite for the usefulness of this is that the relationships between different factors remain the same into the future, which may not be true. It is also noteworthy that the evaluations are reliant on the subjective judgments of the person in charge of the exercise. For this reason, it is advisable to use the inputs of multiple

experts to generate an “average” view of the factors’ relationships. The company can assign this task to the collaborators in charge on a case-by-case basis. For risky target evaluation, the use of external experts for this task is encouraged as well.

### **5.2.3. Key factor analysis**

P3 includes drafting indicative, alternative scenario narratives, determining ranges for scenario parameters (and their probabilities if required), and simulating alternative outcomes to build the final scenarios. As part of P3, describing the logics behind the indicative narratives and the quantified value ranges is important to ensure underlying consistency in the scenarios, which further impacts their credibility and eventual value for SIDM. To separate scenario analysis from sensitivity analysis, more than one parameter should be adjusted for each scenario. During this phase, exploring some extreme scenarios can also be beneficial for the company, particularly if the target operates in a more complex market with less visibility into the future. In general, the scenario process is always iterative; in P3, indicative scenario narratives help determine the realistic/within scope ranges for key factors by forcing the scenario contributors to think of potential reasons for certain outcome – on the other hand, narratives form also the main output of the scenario process.

Again, during P3, collaborative work between the business function and sales analysts can be relevant for determining the possible ranges for key factors for specific scenario narratives. For example, sales analysts’ can bring their rationalized, “best guesses” over price ranges, while the personnel in the field may have more information about the most likely ranges for capacity utilization under different price assumptions. Importantly, the M&A Manager should always rationalize all assumptions as well while completing the P3 “what-if” simulations, possibly supported by business controllers or risk experts. The final number of scenarios should be limited to three to five scenarios in accordance with literature.

In P3, simple approximations of the ranges for key factors should be adequate for safer targets; for example, the company may want to simulate alternative outcomes using a service price ranging from X to Y and different capacity utilization rates within a given timeframe, such as five years. The M&A Manager can combine the information gathered



during cross-functional collaboration and compare it to historical data from internal databases for validation purposes, if required. Also, if confirmatory or additional information is required for the quantitative part, trend-based analysis based public databases can also be used to complement the analysis. Trend-based techniques can be beneficial in more stable environments characterized by strong trends, such as the company's core operating segment.

In contrast, the inclusion of more creative, qualitative elements can be useful for riskier targets as part of P3. Under higher uncertainty or in more unfamiliar markets, comparable data points may not be easily accessible, and lack of expertise may cause information gathered from internal functions to be less trustworthy, resting on subjective assumptions. Using more creative scenario techniques, such as workshops and brainstorming sessions to form imaginary future scenarios, the company can start by forming more general narratives, resulting in a "helicopter view" over the target and its market, before proceeding to observe the unfolded assumptions under quantified, "what-if" scenarios. Out-of-the-box thinking can be more easily facilitated in groups, during sessions explicitly reserved for such work. Overall, this can help the company in identifying the major drivers and sources of risks for a potential deal, and in determining their ability to find ways to mitigate them. Notably, as discussed with the interviewees, risk is inherent to M&A and any other investment and should be approached accordingly.

Also, albeit slightly counter-intuitive, it should be noted that whenever information about a potential target is simultaneously scarcer and more uncertain, striving for too detailed of an analysis may become inefficient in terms of resource expenditure; costs arising from the time spent over analyzing something characterized by high uncertainty may eventually exceed potential benefits drawn from it. Therefore, resources should be carefully managed for scenario analysis over riskier targets.

#### **5.2.4. Scenario generation**

At the end of the scenario generation phase, the output should be a consensus over three to five plausible scenarios for the M&A target. For safer targets, brief narrative descriptions validated through numbers can be adequate, whereas more thorough descriptions for riskier

targets can increase the informational value of the scenarios when presented for decision-makers. In the Intuitive Logics technique, the emphasis is on building scenarios that differ from each other and compose more than mere descriptions of “worst case” or “best case” scenarios; instead, the scenarios should be given descriptive titles and compelling storylines (Morrison and Wilson, 1997). In the company, whether this is required should be determined case-by-case. For example, if an opportunity has been identified, analyzed, and it appears significant in terms of its expected value for the company and local executives wish to proceed, comprehensive scenario descriptions can be used to demonstrate the scrutiny given to the case as part of group-level communication, increasing the investment proposal’s credibility in the eyes of decision-makers.

#### **5.2.5. Scenario learning**

As part of this construction, P5 serves for scenario learning (instead of transfer) because the phase should cover the requirements for learning from previous scenario work. In the company, for this phase to facilitate efficient scenario learning, scenario reviews should be conducted annually, considering M&A deals completed within not less than one and no more than three years ago. The appropriate amount of time prior to undertaking scenario reviews should be determined based on the level of integration strived for between the merged entities and the amount of time required for reliable insights of the outcome versus scenarios. For example, if the company strives for a highly integrated post-merger entity, it can be assumed that more time is required for the integration process to be completed and for the outcome to become representative of the actual post-merger outcome, and for it to become comparable to the estimations made during scenario analysis. For targets that are meant to continue functioning as stand-alone entities or somewhere in-between, one to two years can be enough before scenario review. Notably, this underlines the importance of proper documentation of scenario analyses; this way scenario reviews can be completed even if the personnel involved in the analysis are no longer present in the company. As a general guideline, scenario reviews could take place as part of the company’s annual work concerning overall company- and group-level strategy.

**Table 6. Scenario analysis construction for the case company.**

<b>Scenario analysis process flow</b>	<ul style="list-style-type: none"> <li>• <b>Ownership:</b> Head of Sales &amp; Partnerships</li> <li>• <b>Time reservation:</b> 0,5 to 2 months depending on the level of complexity</li> <li>• <b>Resourcing:</b> 3 to 5 people from relevant functions</li> <li>• <b>Objective:</b> M&amp;A target risk identification, output of 3 to 5 different and consistent scenarios narratively described and quantitatively validated</li> </ul>			
<b>Process phase</b>	<b>Key focus areas</b>	<b>Objectives and comments</b>	<b>Possible techniques</b>	<b>Responsibilities</b>
<b>P1: Scenario field identification</b>	- Setting overall and target-specific objectives	- Set expectations, ensure focus on right areas - Focus on risks in contextual and transactional spheres	N/A	- Head of Sales & Partnerships: ownership - M&A Manager: hands-on management - Sales analysts and business function(s): collaborators - Business controllers/risk experts: support
	- Assignment of responsibilities	- Assign collaborators, clarify their roles, and create a platform for communication		
	- Determination of scope and boundaries	- Limit scenario scope (e.g., transactional/contextual factors) to avoid work "off the rails"	Target categorization	
<b>P2: Key factor identification</b>	- Utilization of cross-functional collaboration	- Involve different functions depending on the target and objectives	Meetings and workshops to facilitate knowledge exchange	- M&A Manager leads, collaboration between assigned team members
	- Identification of key factors in transactional and contextual spheres	- Use predefined key factors for safer targets and more extensive techniques for riskier targets	<b>Safe targets:</b> Pre-determined list + SWOT, Five Forces if required <b>Risky targets:</b> Workshops, PESTLE, SWOT, Five Forces, desktop research, and consultants if required	
		- Abandon unnecessary variables	Influence matrix	
<b>P3: Key factor analysis</b>	- Drafting of narratives	- Combine quantitative and qualitative data	Brainstorming, creative methods	- M&A Manager leads simulations supported by business controllers/risk experts if required, ensuring consistency and sanity of all assumptions
	- Determination of ranges for chosen scenario variables	- Validate ranges with historical data and apply more creative techniques for riskier targets, particularly when no sufficient data are available	<b>Safe targets:</b> Benchmarking, trend-based techniques <b>Risky targets:</b> Workshops, PESTLE, desktop research, benchmarking, and consultants	
	- Simulation of alternative outcomes	- Test how the outcomes change when changing parameter values using different, consistent combinations	DCF analysis with scenarios, subjective consistency/logic checks with narratives that could lead to the outcomes	
<b>P4: Scenario generation</b>	- Textualization of 3-5 plausible scenarios	- Produce 3-5 scenarios beyond just "worst" or "best" cases - Provide compelling narratives and titles for decision-makers	Same as P3 + add probabilities and/or additional variables if required	- M&A Manager ensures scenario consistency and relevance
<b>P5: Scenario learning</b>	- Annual scenario reviews	- Ensure organizational learning and strategic reflection based on past M&A cases	Documentation and archival Utilization of prior analyses for future analyses if relevant	- M&A Manager reviews with local executive team and business controllers if required

## **5.2.6. Considerations for practical implementation**

### ***Implementation plan***

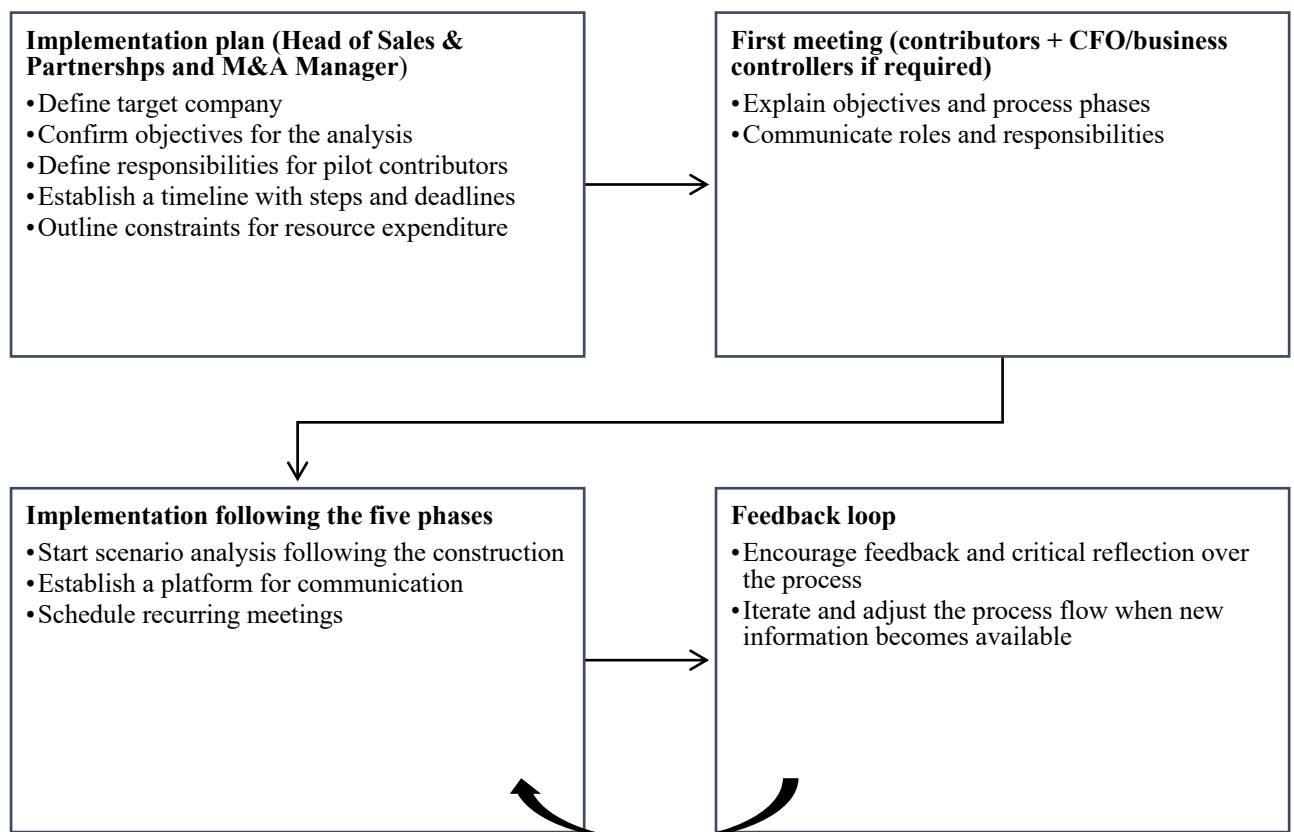
To implement the designed scenario analysis process into practical use for the first time, the company should create a detailed implementation plan to ensure clarity of objectives and responsibilities, establish a timeline for the process, and outline the resources available for the analysis. A group of people, preferably with interest towards scenario work and knowledge required for completing the analysis, should be chosen for the pilot. The implementation plan is advisable to be created by the process owner (Head of Sales & Partnerships) and the person in charge of hand-on management during the process flow (M&A Manager), and the plan is recommended to be revised by others from the company's local executive team to ensure that all required factors and constraints have been accounted for. The timeline for the pilot should be clearly articulated, including a few deadlines and time allocation for each phase and task. Naturally, the timeline should align with any time constraints considering the M&A opportunity chosen to be analyzed during the pilot. Also, in terms of resourcing, the possibility for using outside experts as part of the analysis can be addressed; if not at more detailed level, at least outlining thresholds/criteria after which the utilization of outside expertise can be brought into discussion.

### ***First group meeting***

Once the implementation plan is in place, the first meeting with all contributors should be hosted, led by the Head of Sales & Partnerships and/or the M&A Manager. If considered useful, the CFO and/or a business controller may also participate in the meeting – particularly CFO involvement can be used to signal the importance of the topic and increase personnel engagement. The agenda for the meeting should be to explain the purpose and objectives of the construction, lay out the phases and their main content, and communicate what is required from each collaborator during the first round of implementation. The group of people involved will be functioning as a “test group” during the pilot, and they should not only be dedicated to contributing to the scenario phases but also to making observations of the process flow and giving their feedback and suggestions for improvement.

### ***Implementation and feedback loop***

After the first meeting, the implementation of the construction following the five phases can begin. It is important that a clear platform for communication between the collaborators is created to ensure transparent information exchange and to encourage active participation in conversations regarding the construction itself as well. Particularly during the pilot, it is advisable to have at least weekly meetings between the collaborators and adjust the implementation plan according to new insights. The scenario process will likely be subject to many adjustments along the way, not only during and after the pilot but in the future as well. Establishing a feedback loop for continuous improvement over the process is important. A summary of the guidelines for implementation is given in figure 5 below.



**Figure 5. Guidelines for practical implementation of the construction**

### 5.2.7. The company's approval of the construction

As part of the thesis, the final construction was presented to and overviewed by the professionals who were involved in the process during the interviews. Particularly insights from the professional responsible for making investment appraisals and decisions were central during this. No changes to the construction were made after the overview.

As mentioned in section 3, this thesis passed the CRA weak market test as the professionals interviewed for the thesis expressed a willingness to apply the construction to their practical M&A decision-making processes. The approval of the construction was given by the people responsible for the financial management of the company, including both the CFO and the Head of Business Controlling. As part of the final overview, Head of Business Controlling stated as follows:

*“The main challenges we discussed and the requirements we had for the process have been accounted for in this construction. We believe that this will be a good starting point for our future scenario work in M&A. More systematic and active collaboration between different functions will also help us develop the process further.” - Head of Business Controlling*

On the other hand, the CFO considered the construction as a good starting point to improved risk evaluation, as hoped for during the interview process:

*“I look forward to seeing how more structured scenario work might impact the quality of the information we use for risk evaluation. Particularly more active collaboration can be expected to increase critical thinking within the team.” - CFO*

As suggested in the considerations given for practical implementation of the construction; if the company eventually decides to implement the construction into practical use, more detailed observations will likely arise and pinpoint some requirements for adjustments. However, the construction as such provides a solid starting point for the company's M&A scenario work and a platform for its continuous development.

## **6. DISCUSSION AND CONCLUSIONS**

The objective of this thesis is to explore how scenario analysis can be leveraged for enhanced SIDM in mergers and acquisitions. The research was conducted as a case study of a Nordic company, utilizing both empirical data and insights from literature to construct a systematic scenario analysis process flow in accordance with the company's requirements and preferences. This final section of the thesis begins with a research summary and is followed by a discussion combining the empirical findings presented in section 4 with literature insights presented in section 2. As part of the discussion, managerial insights regarding the benefits and challenges associated with the use of scenarios in SIDM are presented. At the end of this section, the limitations of this study are acknowledged and interesting avenues for future research are suggested.

### **6.1. Research summary**

In the beginning of this thesis, the objectives for the work were outlined in collaboration with the case company's representative. The objectives were determined by naming challenges and uncertainties associated with SIDs concerning M&A, particularly in the social and healthcare industry. As part of the section 2 literature review, it was established that despite the persistent popularity attributed to traditional investment appraisal methods such as the DCF model and NPV calculations, they may fall short in addressing the complexities and risks associated with strategic investments, such as M&A. Here, scenario analysis was proposed as a complementary tool that can support organizations dealing with uncertainties in their environment by directing attention to any discrepancies in the surroundings and by encouraging broader thinking of possible futures.

The data collection phase for this thesis involved semi-structured, in-depth interviews with company executives and managers, all involved in the company's M&A process either as decision-makers or contributors to M&A target evaluation. During the interviews, more detailed images of the company's current methods for M&A evaluation, deal rationales, and the use of scenarios were outlined, with an attempt to identify challenges with prevailing practice. Based on the interviews, the challenges regarding the company's scenario work were mainly related to internal capabilities, division of responsibilities, and low level of

systematization in the process. The latter part of the interviews included questions around the requirements for the construction, and the interviewees therefore had the opportunity to contribute to the designed construction. In addition, additional commentary regarding the construction was given by a company representative as the fifth interview was held at the end of the thesis work.

As usually in the practical application of scenario analysis methodologies (Kosow & Gaßner, 2008), the construction (as detailed in section 5) created in this thesis integrates both quantitative and qualitative scenario techniques. A hybrid approach is adopted, combining characteristics from the systematic-formalized scenario methodologies with more creative elements from the “Intuitive Logics” school of thought, as distinguished by Kosow & Gaßner (2008). The choice of a hybrid approach is a result of balancing the company’s preference towards quantitative information with the requirements of the dynamic world, underlining the need to think exploratively, creatively, and without excess limitations of unnecessarily formalized approaches to scenario work. The inclusion of explorative elements as part of the process flow is suggested particularly for high-risk targets, which may require broader analysis of factors in both the company’s transactional and contextual spheres.

In the construction, the scenario process is divided into five phases, aligning with Kosow & Gaßner (2008): scenario field identification, key factor identification, key factor analysis, scenario generation, and scenario learning. The last phase of the analysis was modified from scenario “transfer” to scenario *learning*, for it to better describe the content of the phase, built to support organizational learning through scenarios. The key focus areas, objectives, techniques, and responsibilities for each phase in the construction were outlined in the process description in section 5. To summarize, the involvement of cross-functional collaboration, clear division of responsibilities, and appropriate level of depth and breadth in the analysis are central to the construction. Categorization of deal targets is suggested to give guidance on the extent of the analysis as well as possible inclusion of explorative elements; targets characterized by higher uncertainty, complexity, and higher risks, should be analyzed with a more holistic approach, and vice versa. The categorization task may also help perform efficient and justified resource allocation for scenario analysis, and



systematically filter targets for in-depth analysis instead of following the more standardized steps for what-if scenarios. Nonetheless, what-if scenarios - also currently prevalent in the company – can continue to be adequate for targets within the company’s core competence or which are otherwise considered less risky.

### ***Contribution***

The contribution of this thesis is twofold, providing both pragmatic and academic insights. First, as a constructive single-case study, this thesis provides evidence of requirements for scenario analysis as a tool to cope with uncertainty under real-life circumstances, providing the case company with a scenario analysis process flow for M&A. The construction is designed to fulfill those requirements, and therefore suggests a practical approach into designing a scenario analysis process flow for a real entity. As part of the empirical findings, the value attributed to and the challenges associated with the pragmatic use of scenarios are elaborated on as well, which further increases the pragmatic relevance of this thesis.

Academically, this thesis enriches the SIDM literature by integrating literature insights from both accounting and futures studies, examining the value of scenario analysis for investment appraisal and risk evaluation alongside more traditional accounting techniques. As described in the literature review, the use of traditional accounting methods may not suffice for SIDM under uncertainty, and scholars may consequently find it reasonable to seek for ideas from multidisciplinary fields, such as futures studies, and possibly integrate the ideas to their own research. Overall, this thesis shows that scenario analysis can be a valid addition to the investment appraisal toolkits used in companies, touching upon a theme highly relevant for the research field of managerial accounting.

## **6.2. Managerial insights**

Based on the findings in this thesis and previous literature, scenario analysis can be argued to bring value for companies and their managers coping with SIDM under uncertainty. However, there are some challenges as well that may impact managers’ willingness to implement scenario analysis as a tool for SIDM, and which managers vouching for scenario

work should be made aware of. In the discussion that follows, the suggested value and challenges associated with scenario analysis are reflected on, using both previous literature and the findings in this thesis as guidance. As part of the reflection, the value arising from scenario analysis is roughly divided into *information value* arising from the broader thinking provoked by scenario work, and *communication value* resulting from enhanced collaboration and a structured “platform” for communication between analysts, decision-makers, stakeholders, and presenters of the investment proposals. The challenges can mostly be traced back to the ambiguous nature of the information used for producing the scenarios and to the resource intensity often tied to practical scenario work.

### **6.2.1. Value in scenario analysis**

#### ***Information value***

Looking at the value addition scenarios can produce for SIDM, a significant part of it arises from the novelty of and/or creative recalibration of the information produced during scenario analysis. As one may expect, the ways in which scenario work encourages thinking of the less thinkable and questioning the assumptions used for investment appraisal, it can enhance the quality of the information. Courtney et al. (2013) argue that over-reliance on traditional accounting methods (e.g., NPV, IRR, payback time) persist, and yet companies could benefit from using a wider analytical toolkit for investment appraisal. It is easy to understand that incorrect assumptions in investment appraisal can misdirect decision-makers and lead to sub-optimal SIDs, either through advising to abandon opportunities that seem worse than they are or by encouraging to undertake investments unlikely to succeed.

Particularly M&A as complex investments, characterized by significant failure rates, can be argued to be sensitive to judgment errors, and the use of additional tools to sanity-check the assumptions can increase the quality of M&A decisions in companies. Scenario analysis can assist in this; it can help managers and decision-makers simulate the most plausible and other possible consequences of alternative future developments for specific projects, while ensuring consistency of impactful event chains and thereby increasing the credibility of investment proposals. As an example, instead of merely relying on adjusted NPV calculations (e.g., using higher discount rates or risk-adjusted cash flows), practitioners can

use scenario analysis to create storylines that concretize imaginary futures and the paths that lead to them (Börjeson et al., 2006). Also, explorative scenarios can help in identifying the most impactful factors characterized as “pivotal uncertainties”, or direct attention to less impactful and yet highly uncertain “potential jokers” (see table 2 in subsection 2.3.5.2.), which may eventually give ground for new opportunities to companies. Hence, as part of the process, scenario contributors may detect signals of some fundamental changes in their operating environment, possibly requiring changes to strategy and/or business model. Overall, scenario work can unlock creativity required for imagining alternative, comparable futures and help detect vulnerabilities that should be addressed, giving guidance on SIDM under uncertainty (Kosow & Gaßner, 2008).

### ***Communication value***

Another significant part of the value in scenario analysis can be attributed to the increased communication between different functions during scenario collaboration (Kosow & Gaßner, 2008). By involving different departments in the scenario process, companies can ensure that a broad range of perspectives and expertise are included. The empirical findings in this thesis align with this and highlight the need to include cross-functional collaboration in scenario work. In practice, relevant information can often reside among personnel working hands-on “in the field”, those people also having the best understanding of the day-to-day challenges that should be accounted for in project execution. Importantly, the inclusion of the personnel involved in execution is expected to have a positive impact on the outcome; the people become more informed, feel more included and committed, and become aware of the risks associated with the project and possible ways to mitigate them in practice.

In addition, scenario work provides a platform for more frequent and transparent communication between personnel in the field, analysts, investment proposal presenters conducting the appraisal, decision-makers, and other stakeholders. By breaking down complex, vague, and uncertain futures into more manageable and intuitive storylines, scenarios can smoothen the communication flow within companies, ensuring that all stakeholders are on the same page during presentations and negotiations. Generally,

scenarios can be used to translate complex information into more accessible and structured formats (Kosow & Gaßner, 2008).

### **6.2.2. Challenges in scenario analysis**

While potentially beneficial for companies in many ways, scenario analysis also presents companies with some challenges they must cope with. First and foremost, an obvious challenge lies in the complexity and uncertainty associated with predictions of any future scenarios. As discussed in section 2.1.2, humans' ability to predict is dependent both on the complexity of the phenomena and/or system being predicted as well as the data available; for example, some natural phenomena can be relatively predictable (Savvides, 1994) based on physics and historical observations, whereas predictions in high-velocity, dynamic business contexts are often impossible to reliably predict. Particularly contextual factors, such as political and environmental risks, can increase the level of unpredictability in contemporary market environments. However, as one may conclude, this fundamental issue is a challenge for scenario work while also being part of the challenge being solved using scenarios. In essence, unpredictability is an issue particularly for predictive scenario work and even more for pure forecasting methodologies; in contrast, it is less of a challenge for explorative scenario work not used for predicting per se. Notably, possibly due to the challenging nature of predicting and the "flesh" of scenario work, early scenario developers have even neglected the inclusion of the more predictive approaches as scenario typologies (Börjeson et al., 2006).

In general, it can be argued that making predictions in scenario analysis requires a delicate balance between reliable quantitative data and high-quality qualitative insights. Companies' ability to achieve the balance is not always evident. Even if a company had enough data points available, there is no guarantee of the accuracy or relevancy of the data considering the current state, and analysts' judgment is central for data validation. For the qualitative part, the composition of the collaborating team is crucial – the team must have enough experience, knowledge, and resources available for high-quality insights. For one, resource scarcity can adversely impact information quality if capable enough personnel are not available. Furthermore, the scenario process can be resource-intensive and demand substantial amounts of time from the contributors. After all, the relevancy, accuracy, and

consistency of the produced scenarios relies much on the quality of the data used for scenario generation, and inaccurate or biased data can produce misleading scenarios, negatively affecting SIDM.

### **6.3. Considerations and limitations**

While the construction formed in this thesis provides a systematic approach to SIDM for the case company, there are several consideration and limitations to this study that should be addressed. First, the research is based on a single case study, which may limit the generalizability of the findings. Understandably, the unique characteristics of the case company, such as the company's existing practices and policies, interviewee opinions and future perceptions, and the company's focus areas within the social and healthcare industry, influenced the choices for the construction. Consequently, the process flow may require significant adaptation if applied to other contexts. Moreover, as discussed in section 3 touching the research methodology, the CRA requires a market test, testing for the relevance of the construction. Because of the limited time scope of this thesis, the construction was subject to a weak market test, requiring that a person responsible for financials in the company be willing to implement the construction into practical use. Nevertheless, even a weak market test can be argued to adequately prove the relevance of the construction as stronger market tests frequently require statistical analysis and the process for completing them can require significant amounts of time (Kasanen et al., 1993).

Secondly, scarcity of prior research to support designing the construction may have slightly hindered the thesis work. There was a lack of variety in papers that concern practical scenario techniques, and the techniques applied for the construction were drawn mostly from the paper written by Kosow & Gaßner (2008). Alternative sources were either inaccessible or written in German language. On the other hand, the scholars had utilized the insights of various German scenario developers, who have made significant contributions to the scenario field. Therefore, it can be argued that the construction rests on high-quality insights regarding the topic.

Thirdly, observer bias may have skewed the analysis of empirical findings as well as the design of the construction, even when objectivity was held a central consideration throughout the thesis. As explained in section 3, the CRA requires intensive involvement from the researcher in producing the construction, and the threat of observer bias may be magnified under such circumstances (e.g., Lukka, 2003). However, it has been argued that observer bias neither can nor should be attempted to be fully eliminated from research (McKinnon, 1988). The methods for controlling the observer bias in this thesis have been elaborated on in more detail in section 3.2.

Lastly, another limitation worth keeping in mind during the practical implementation of the construction arises from the hybrid approach to scenario analysis used in it, i.e., using a combination of quantitative and qualitative methodologies. While being more comprehensive than either alone, the approach may also lead to unnecessary complexity during implementation. Balancing detailed quantitative analysis with qualitative scenario work can be resource-intensive and might present challenges for companies with limited expertise and resources. However, as for the implementation of any change or new process, an iterative approach with a continuous feedback loop is recommended, as discussed in section 5.2.6. This way the construction can be adjusted based on actual outcomes and new requirements along the way.

#### **6.4. Suggestions on future research avenues**

While this thesis provides one approach for the application of scenario analysis into a predictive, accounting context, a generosity of interesting future research avenues within this topic can be highlighted, accounting for both the utilized research methodology and the specific approach taken to scenarios.

First, different research methodologies can provide researchers with novel and practically relevant research angles on the topic. While this thesis was conducted as a single-case study with the CRA and limited to a specific industry, comparative single- and multiple-case studies across a wider range of industries could bear interesting insights for researchers. Furthermore, the research setting of this study could be applied to other contexts, with an attempt to assess the adaptability and effectiveness of the construction designed in this

thesis. Naturally, comparative studies could provide insights into the impact of industry-specific factors on the requirements for the design and on the objectives set for scenario work. Industry-specific factors may be significant particularly for the choice of scenario methodologies.

Linked to the choice of research methodology, the inclusion of quantitative validation over scenario relevance may also provide ground worth exploring. As this thesis is limited to a weak market test, further constructive studies could be tested by stronger market tests and statistical analysis in longitudinal research settings, arriving at more trustworthy general implications for practitioners; either supporting the use of scenarios in managerial accounting or not. Moreover, there is room for more research regarding scenario analysis in *accounting* in general because much of the current scenario literature is based on *futures studies* and is limited to quite conceptual approaches, research on scenario techniques for accounting remaining on a rather surface level.

Secondly, while the choice of research methodology already provides options for future research, other interesting directions can be found in the choice of scenario typology and the purpose assigned to scenarios. As the focus of this thesis is on the possibilities for using scenario analysis especially for risk identification, exploring the topic from an opportunity-driven angle may be fruitful and relevant. Research from this angle could increase knowledge of how scenarios can be harnessed to not only mitigate risks but also to make the most of them.

Importantly, future research within the SIDM domain should aim at encouraging management accounting practitioners to adopt bolder, broader, and more creative approaches to investment appraisal and SIDM. After all, as constant change is inevitable, why should our methods to evaluate strategic investment decisions not evolve too? The number of disruptive events around us is unlikely to decrease any time soon, and in facing them, those bold, critical, and creative enough to think of the unthinkable will likely be better off than those continuing to rely on the rear-mirror.

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# APPENDIX

## Interview template

These preliminary questions have been structured to capture insights for the purpose of designing a scenario analysis construct meant to enhance M&A decision-making within the interviewed company. The questions are used as a template for semi-structured interviews. Adjustments to the template may be made based on specific interview outcomes and/or additional findings from literature.

### Background information

- 1.1. Can you describe your role in the organization? How long have you been working in this position and in the organization?
- 1.2. What are your responsibilities in terms of mergers and acquisitions (hereinafter referred to as M&A)?

### M&A rationales and current evaluation techniques

- 2.1. What are the key rationales for M&A investments in your company (e.g., growth, cost/revenue synergies, diversification of risks, etc.) How frequently does the company conduct M&A?
- 2.2. Can you describe the typical process for the evaluation of different M&A alternatives in your pipeline? For example (questions selected based on the responsibilities of the interviewee):
  - 2.2.1. How do you identify and select potential targets?
  - 2.2.2. How do you evaluate the target's strategic and cultural fit (i.e., qualitative features)?
  - 2.2.3. How do you evaluate and quantify the potential value from M&A (tangible and/or intangible)?
  - 2.2.4. How do you account for risks associated with M&A? Do you quantify them?
  - 2.2.5. How about other capital investment, what are the investment appraisal and risk analysis techniques you used for their evaluation?
  - 2.2.6. Do you apply scenario analysis techniques in the current M&A evaluation process?
    - 2.2.6.1. What techniques and why?
    - 2.2.6.2. How about other investments: how do you utilize scenario techniques in their evaluation?
  - 2.2.7. How do you make the final decision to proceed or abandon a M&A case?

### Individual perceptions of future

- 3.1. How do you view the future?
  - 3.1.1. To what extent do you see the future as predictable and controllable? Why?

3.1.2. To what extent do you see it as chaotic and following random paths?  
Why?

3.2. Considering the balance between predictability and randomness; to what extent do you think the future can be manipulated through intervention and adequate planning?

The construct: scenario analysis design

#### 4.1. General

4.1.1. Who should have the primary ownership over the scenario analysis process? Why?

4.1.2. What functions and/or people should contribute to the scenario analysis process? Why?

#### 4.2. Phase 1: Identification of the scenario “field” and objectives

4.2.1. Which M&A projects should scenario analysis be applied to?

4.2.2. Should scenario analysis be applied to all M&A cases in the pipeline, or just those that exceed certain thresholds or fulfill certain criteria? Why?

4.2.2.1. If not all: what thresholds or criteria should be used to select M&A cases for scenario analysis? Why?

4.2.3. For what purpose do you want to implement scenario analysis into your M&A evaluation process?

4.2.4. What kind of factors should be integrated? On the other hand, where are the limits and what is to be left out of scope?

4.2.4.1. For example, do you want to identify opportunities or threats, or both? Do you want to explore possible future developments irrespective of their desirability, or rather identify desirable futures and alternative paths to arrive at those?

4.2.5. Can you provide a historical example of a situation where scenarios could have supported your decision-making process?

4.2.6. What are the main benefits you expect from the use of scenario analysis in the context of M&A?

#### 4.3. Phase 2: Identification of key factors

4.3.1. What are the most important criteria to consider when evaluating the attractiveness of M&A?

4.3.2. What kind of information do you want to extract from the scenario analysis process?

4.3.2.1. For example, do you want to establish narrative, qualitative descriptions of alternative future environments to support target selection?

4.3.2.2. Or do you want to establish quantitative models of alternative value outcomes for a specific investment (e.g., what-if analysis and simulation)? Or both?

4.3.2.3. What do you think are the key variables, parameters, trends, developments, and events that should be considered as part of the scenario analysis process? For example; firm revenue and costs, key personnel retention, wider industry and environmental trends and developments (e.g., PESTLE), possible outlier events, etc.

4.3.2.4. How and by whom do you think information regarding the factors should be collected? For example, do you think one person should be responsible for the collection of the information, or should the process include collaborative workshops and individual surveys?

#### 4.4. Phases 3 & 4: Analysis of key factors & scenario generation

4.4.1. Who do you think should be involved in analyzing the key factors and their relationships?

4.4.2. What kind of qualitative and/or quantitative analysis techniques should be conducted? Why?

4.4.3. To what extent do you think intuitive expertise may affect these phases? How do you reflect upon the accuracy of subjective judgments?

4.4.4. Can you provide an example of a M&A case where intuition may have significantly sculpted the evaluation of and the decision to proceed with or abandon a case?

#### 4.5. Phase 5: Scenario transfer (optional)

This phase involves a description of the further application and/or processing of scenarios which have been generated. This phase is generally considered as optional but may assist in organizational learning.

4.5.1. How often and by whom do you think the prior scenarios should be revised and the learnings integrated into new scenarios?

4.5.2. Do you think scenario analysis documents should be shared with and communicated to others within the organization? Why?

4.5.3. How could the company harness organizational learning to enhance the scenario analysis process and decision-making in the future?

4.5.4. Where should scenario analysis documents be archived? Why?