Babeş-Bolyai University

Faculty of Economics and Business Administration

Summary of Doctoral Thesis

How Does Ambidexterity Drive Organizational Agility and Performance?

Scientific coordinator:

Levente Szász, PhD, full professor

PhD Student:

Gerald Stei

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Abstract

Purpose – Against the backdrop of existing and impending social, economic and geopolitical crises, organizational research has shifted its attention to organizational agility as a means to deal with environmental uncertainties and raise organizational performance. The author adopts an organizational learning perspective to examine how organizations can facilitate agility. The development of organizational agility involves organizational learning strategies such as tapping into external (exploration) and internal (exploitation) knowledge resources. While prior research has found that ambidextrous organizations capable of balancing out the two strategies can improve organizational performance, it remains unclear if that is also true for the development of agility. This thesis analyses how such ambidexterity can foster organizational agility and, in turn, performance. Furthermore, the author tests if enterprise social media (ESM) use moderates the ambidexterity−agility relationship. Investigating two further potential moderators (environmental competitiveness and knowledge intensity), this thesis sheds light on the relevance of different contextual environmental conditions in the proposed research setting.

Design/methodology/approach – Using the dynamic capabilities (DC) approach and the knowledge-based view (KBV), a systematic literature review is presented on the constructs of interest to define a research model. A review of existing measurement models for ambidexterity shows that a crucial aspect, tension, is often neglected. The author therefore develops an alternative measurement model of ambidexterity that addresses that aspect. Using this measurement model, he then applies partial least squares structural equation modelling (PLS-SEM) to examine the effect of ambidexterity on the development of entrepreneurial and adaptive agility, as well as performance, and to investigate the moderating impact of ESM use, environmental competitiveness, and knowledge intensity.

Findings – The analysis reveals that ambidexterity (a balance between exploration and exploitation) has a significantly positive impact on both, entrepreneurial and adaptive agility. This finding confirms the ambidexterity hypothesis with respect to organizational agility. This positive effect is even more pronounced under the influence of high levels of environmental competitiveness and knowledge intensity. However, the analysis reveals no significant moderating effect of ESM use in this regard, but rather shows a direct effect on both agility dimensions. In addition, both entrepreneurial and adaptive agility have a direct, significant impact on improving organizational performance. The two indirect effects *via* agility fully mediate the impact of ambidexterity on organizational performance, which challenges a direct effect of ambidexterity on performance that has been established in prior research.

Originality – The thesis examines how organizations can become more agile to face environmental uncertainties. To analyse the effect of ambidexterity, this thesis distinguishes between an active (entrepreneurial agility) and a passive dimension (adaptive agility) to test whether the impact of ambidexterity on organizational performance is mediated by agility. Additionally, the author introduces an alternative method of measuring the ambidexterity construct. By providing a comprehensive operationalization of ambidexterity, this thesis contributes to the existing research on the topic and opens up opportunities for future applications of the concept. Furthermore, this thesis demonstrates the impact of ESM use on the development of organizational agility in an organizational learning context. This sheds light on previously unknown organizational effects of ESM use and paves the way for future in-depth examinations.

Keywords Ambidexterity, Agility, Enterprise social media, Environmental competitiveness, Exploitation, Exploration, Knowledge intensity, Measurement, Performance

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List of abbreviations

AA Adaptive agility
Abbr Abbreviation
AIC Akaike's information criterion
AIC_3 Modified Akaike's information criterion with factor 3
AIC_4 Modified Akaike's information criterion with factor 4
Amb Ambidexterity
AVE Average variance extracted
BIC Bayesian information criterion
CAIC Consistent Akaike's information criterion
CSV Comma-separated value
DC Dynamic capabilities
e Residual term
e.g. exempli gratia (for example)
EA Entrepreneurial agility
EC Environmental competitiveness
EFS Enterprise feedback suite
EN Normed entropy statistic
ESM Enterprise social media
ESMU Enterprise social media use
FIMIX-PLS Finite mixture partial least squares
H_0 Null hypothesis
H_1 Alternative hypothesis
HTMT Heterotrait-monotrait ratio
i.e. id est (that is)
ID Identification
IPMA Importance-performance map analysis
IT Information technology
ITC Information technology capability
KBV Knowledge-based view
KI Knowledge intensity
KIO Knowledge-intensive organization
KMC Knowledge management capability
KMS Knowledge management system
LM Linear regression model
LnL LogLikelihood
LVS Latent variable score
M Sample mean
MAE Mean absolute error
MDL_5 Minimum description length 5
ns not significant
O Original sample
OC Operational capabilities
OP Organizational performance
Org Organizational
p Error probability
Perf Performance
PLS-POS Partial least squares prediction-oriented segmentation
PLS-SEM Partial least squares structural equation modeling
R^2 Coefficient of determination
RBV Resource-based view
RMSE Root mean square error
RSS Really simple syndication
SD Standard deviation
SEM Structural equation modeling
VIF Variance inflation factor
VRIN valuable, rare, imperfectly imitable and non-substitutable
VUCA volatile, uncertain, complex, ambiguous

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1 Introduction

Agility has become a central construct in operations management research. A variety of recent, disruptive events, such as health crises, political and military conflicts, have shown the necessity to keep agility in the focus of both, practice as well as theory, as it can be considered a central strategic capability for organizational robustness, flexibility, and, ultimately, survival (Aslam et al. 2020; Do et al. 2021; Müller et al. 2023). The search for agility is soaring, as in today's continuously changing and widely uncertain business landscape organizations face the challenge to defend, maintain, and even expand their level of competitiveness (Harraf et al. 2015). In fact, prior research has linked organizational agility to increased organizational performance (*e.g.* Ahammad et al. 2021; Cai et al. 2013; Chakravarty et al. 2013; Nejatian et al. 2018).

Organizational learning has been characterized as a key capability to foster agility (Teece 2009). Organizations in uncertain situations need to continuously scan their environment, interpret it, draw adequate conclusions and formulate proper decisions. They need to learn and collect information and knowledge from inside as well as outside the organization. Organizations can follow two fundamental learning strategies: (1) On the one hand they may use existing relevant knowledge from within (exploitation) and (2) they may utilize relevant knowledge from outside (exploration). The combination of both strategies has been called ambidexterity, which is about a simultaneous pursuit of exploration and exploitation (Patel et al. 2012). It relates the exploration of new possibilities to the exploitation of old certainties (March 1991). The pursuit of both learning strategies simultaneously promises desirable organizational effects but also poses heavy demands on organizations (Hughes 2018). Prior research has formulated the so-called ambidexterity hypothesis, which claims that ambidextrous organizations (organizations that are capable of balancing out exploration and exploitation strategies) are generally awarded with higher organizational performance in the long run. He and Wong (2004) have empirically confirmed this hypothesis, yet it remains unclear whether ambidexterity has a positive effect on the development of organizational agility, as this effect has not been a subject for scholarly research so far. While a positive impact of ambidexterity on agility has been theorized (O'Reilly and Tushman 2013), an empirical test in an operations management context is still pending. Thus, current knowledge on ambidexterity (*e.g.* O'Reilly and Tushman 2013; Raisch and Birkinshaw 2008) needs to be expanded to include its immediate effect on agility.

To summarize, the relationship between ambidexterity, organizational agility and performance can be viewed as the central cornerstone of this thesis. However, several additional questions are also of interest. A first issue refers to the use of IT systems to facilitate

organizational learning activities. Organizations have traditionally relied on so-called knowledge management systems (KMS). However, practical experiences show that these systems often do not deliver the expected benefits. Coding efforts for employees are high, and the incentives for actively contributing to such systems often remain scarce. Recently, the use of enterprise social media (ESM) promises advantages over the traditional KMS as they offer a seamless knowledge transfer among employees.

Another open research issue refers to the role of different variables that potentially may be relevant to the development of agility. Prior research has proposed different contextual variables that may be relevant in a DC context, for example, the so called VUCA (volatile, uncertain, complex, ambiguous) conditions (North and Kumta 2018). This thesis focuses on two related potential moderating variables. First, since agility allows firms to gain a competitive advantage, it is particularly valuable in environments characterized by a high degree of competition. Second, knowledge can be considered a central organizational resource in the development of agility in an organizational learning context. Therefore, the knowledge intensity of the organization may facilitate the development of agility. This thesis examines the role of these variables (environmental competitiveness and knowledge intensity) as well.

To summarize, there are multiple gaps in current literature: (1) A potential mediating effect of agility in the ambidexterity−performance relationship is still unknown. (2) Current measurement approaches of ambidexterity neglect the tension that accompanies ambidexterity. (3) The role of ESM use in the development of agility has not yet been examined. (4) The impact of variables such as environmental competitiveness and knowledge intensity remains unclear as of today.

This thesis takes on an organizational learning perspective on organizational agility. It aims to examine how the pursuit of two different knowledge strategies (that is exploration and exploitation) can support developing organizational agility and it analyses how this agility drives organizational performance. Furthermore, this thesis describes which roles ESM use, environmental competitiveness, and knowledge intensity play in the ambidexterity−agility relationship. Specifically, this thesis addresses the following research questions:

1. *How does ambidexterity affect organizational agility and, indirectly, organizational performance?*
2. *How can ambidexterity be measured in this context?*
3. *How does ESM use influence the relationship between ambidexterity and agility?*
4. *How do environmental competitiveness and knowledge intensity influence the relationship between ambidexterity and agility?*

2 Theoretical foundation

The first theory that is relevant for the given research endeavour refers to DC. The DC concept gained rising attention in the 1990s (*e.g.* Teece and Pisano 1994). Since then, it has become an established concept in strategic management research that acknowledges the dynamics of markets. Specifically, the DC concept can be drawn on to gain an understanding of the success of organizations in highly dynamic and competitive environments. Its central idea is that, to thrive, organizations need to be aware of opportunities in their environment and make use of these opportunities. The DC concept acknowledges dynamic developments in the business environment and helps to explain changes within organizations. It is this connotation of change and evolution that is indicated by the term 'dynamic' (Easterby-Smith and Prieto 2008).

The DC concept focuses on organizational resources. It attributes differences in competitive positions to different possessions of resources and capabilities. These capabilities in turn influence organizational performance. Originally, Teece et al. (1997) defined DC as an organizational capability that refers to the integration, development and reconfiguration of competencies that help organizations to cope with rapidly changing environmental conditions. Eisenhardt and Martin (2000) subsequently extended the definition by emphasizing the importance of resources in organizational processes (in particular for integration, reconfiguration, collection and freeing of resources). Resource (re-)configurations are particularly important in emerging, colliding, splitting, evolving, and dying markets. In a further established definition, Helfat et al. (2007) characterize DC as an organizational capability for the creation, extension, or modification of the resources base.

A resource can be understood as an asset or input to production and it is important for the organization to own the asset, control it, or have regular access to it (Helfat and Peteraf 2003). These assets are part of the organization's resource base.

In strategic management literature, the KBV is considered as a variant of the resource-based view (RBV). The RBV regards enterprises in terms of their resources and capabilities. Its central assumption is that not all resources are distributed equally among enterprises, nor do enterprises share the same capabilities. This heterogeneity in resources and capabilities may cause competitive advantage and disadvantage. Especially resources that simultaneously meet the VRIN conditions play a major role in this regard. The RBV therefore provides an explanation of competitive effects caused by resource heterogeneity (Helfat and Peteraf 2003).

The meaning of knowledge in a knowledge economy (*e.g.* Makani and Marche 2010) is without doubt of paramount importance. Organizational knowledge has found its way into enterprises' strategic considerations. Organizational theory has also acknowledged the relevance of the knowledge resource. The KBV of the firm considers knowledge a key strategic resource.

Knowledge can be the source of competitive advantage, especially in organizations that rely heavily on this resource.

To analyse prior articles on organizational agility, organizational performance, and ambidexterity, a systematic literature review was conducted. This systematic literature review follows the suggestions of Durach et al. (2017) to guide its search efforts and to retrieve as well as analyse relevant articles. As such, this thesis performs a series of systematic steps.

The thesis creates a framework for the phenomenon of interest. The main interest of this review is the concept of organizational agility. Consequently, it is part of the research framework. Prior research approaches organizational agility as a dynamic capability (*e.g.* Roberts and Grover 2012). Specifically, organizational agility can be understood as a higher-order capability that is facilitated and enhanced by lower-order capabilities (*e.g.* Cai et al. 2013). This literature review follows this approach. This thesis includes this construct in the theoretical framework. In total, three constructs are part of this systematic literature review: (1) Organizational agility, (2) organizational performance, and (3) ambidexterity.

Appropriate inclusion and exclusion criteria had to be created. The thesis focuses on English-language articles on the three constructs of interest published in scientific journals and conference proceedings. To be included in the analysis, the articles also have to be double-blind peer reviewed. Furthermore, they have to refer specifically to organizational learning or be applicable in such a context. Subsequently, articles from contexts that do not refer to an organizational learning context were excluded from the analysis. Another exclusion criterion is the unit of analysis: Articles that do not refer to the organizational level but, for example, to an employee level, a project level or enterprise network level, were not retained for further analysis.

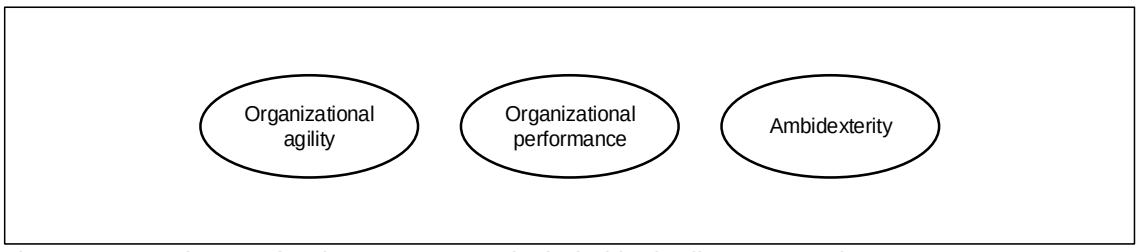


Figure 1: Overview on the three constructs included in the literature review
Source: Own compilation

This thesis proceeded accordingly to find articles that refer to all other combinations of the constructs of interest as indicated in Figure 1. To avoid missing out on relevant articles that are not listed in the Clarivate Web of Science Core Collection database, the thesis additionally addressed two further scientific databases: EBSCO Business Source Complete (http://search.ebscohost.com) and ScienceDirect (http://www.sciencedirect.com). The use of different databases as sources of information may help to void missing single publications as each database can be considered to have a unique scope (Schryen 2015).

These searches were conducted on 14th December 2023. After scanning the title, abstract, and body of each article, all publications that either did not meet the inclusion criteria or met the exclusion criteria were eliminated. Afterward, a snowball sampling process was conducted to retrieve additional potentially relevant journal and conference articles. This led to the final sample of 124 articles for the systematic literature review. Figure 2 displays the section process for the reviewed articles.

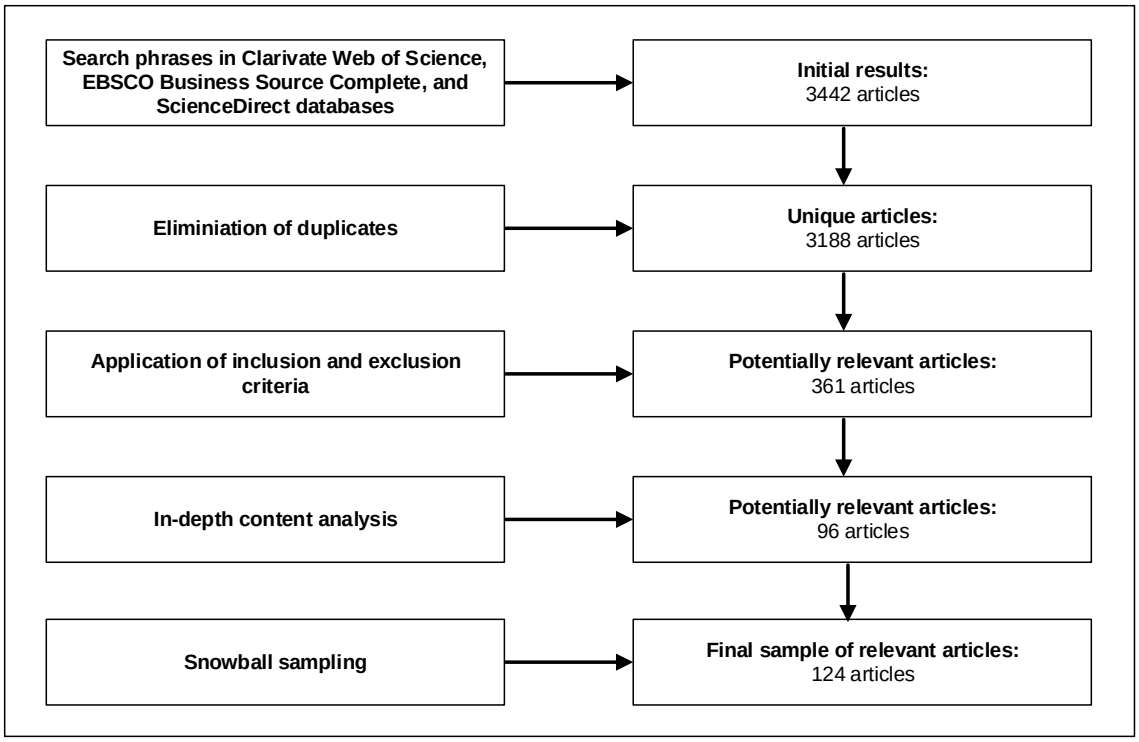


Figure 2: Selection process for the reviewed articles
Source: Own compilation

Organizational agility: The literature search identified 57 articles that focus on the construct of organizational agility. The remaining hits refer to the other constructs of interest. This thesis classifies the search results into primarily knowledge management-related articles and primarily IT-related articles. The analysis shows that 38 articles examine organizational agility primarily in an IT-related context while only 19 articles describe organizational agility in a knowledge-related context.

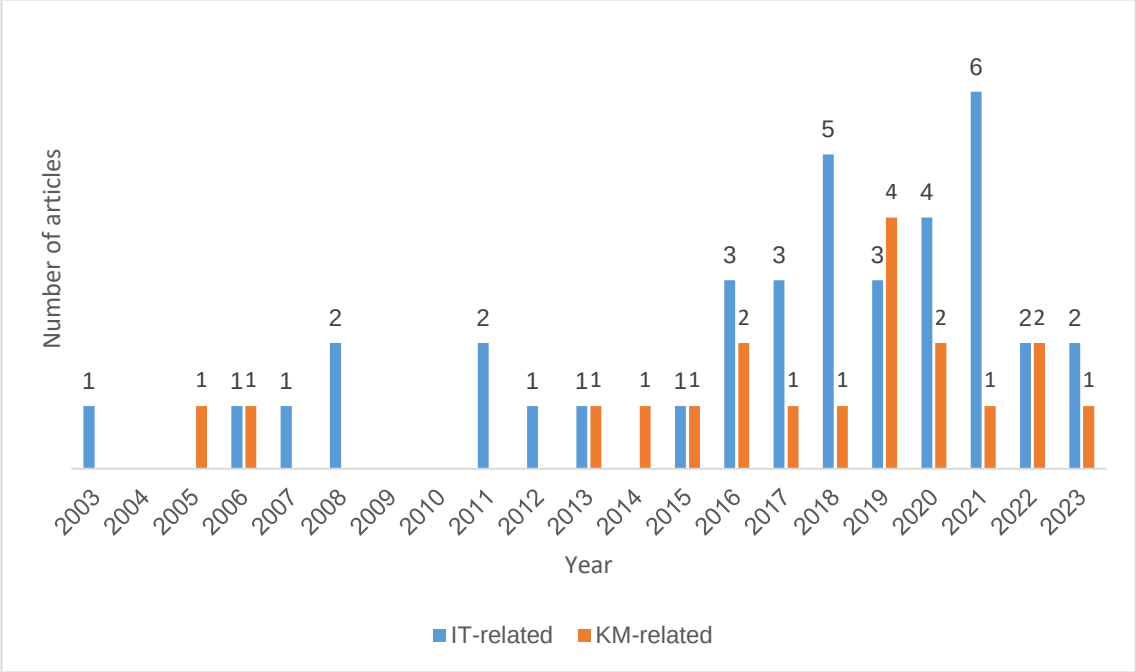


Figure 3: Overview of reviewed articles per year
Source: Own compilation

Figure 3 shows the number of reviewed articles per year between 2003 and 2023. It distinguishes between organizational agility articles primarily from an IT-related context (represented by the blue columns) and from a knowledge management-related context (orange columns). A look at the total numbers of publications per year (blue and orange columns) reveals that, while the topic of organizational agility has gained some attention prior to 2011, it has only been present to a greater extent in the reviewed publications afterwards. In 2016, the topic has accelerated with several publications per year. Organizational agility research, therefore, can be described as a rather young research field. The majority (42 of 57, or 73.68%) of articles analysed have been published since then (2016 or later). The peaks are in the year 2019 and 2021 with a total count of seven publications on organizational agility each. A look at the blue columns reveals that organizational agility is well-established in IT-related research with several publications per year since 2016. The orange columns indicate that knowledge management-related research has touched the topic of organizational agility less often. While this topic has gained more attention since 2016, it shows considerably less publications than the studies with an IT-related context. In 2019, organizational agility was subject to more knowledge management-related articles (four) than IT-related articles (three). While the IT-related research seems to be accelerating again between 2019 and 2021 (2019: Three articles; 2020: Four articles; 2021: Six articles), knowledge management-related research on organizational agility seemed to slow down in that period (2019: Four articles; 2020: Two articles; 2021: One article). In 2022 and 2023 the number of publications declined (2022: Two IT-related and two knowledge management-related publications; 2023: Two IT-related and one knowledge management-related publications).

The analysis reveals different definitions of the construct of organizational agility. A central definition of organizational agility stems from Chakravarty et al. (2013, p. 984) who, building on the work of Overby et al. (2006), distinguish between entrepreneurial agility (that is about the proactive anticipation and response to dynamic market developments) and adaptive agility (that refers to a defensive detection and response to dynamic market changes). Proposing these two forms of agility, the authors distinguish between an active agility aspect and a passive agility aspect. These aspects refer to the capitalizing on opportunities (sensing) as well as the passive becoming robust against threats (responding). The distinction between an active and a passive component of agility makes this conceptualization interesting for this thesis. It resembles the ambidexterity construct with its exploration and exploitation components. Both concepts comprise a primarily internal and a primarily external component. Therefore, it was considered fruitful to examine them in tandem.

With respect to conceptualizations of organizational agility, the data show that there is a large consensus in the reviewed articles to describe organizational agility as a multidimensional construct. Most articles describe organizational agility as a two- or three-dimensional construct. Table 1 provides an overview on dimensions of organizational agility from selected reviewed articles.

Table 1: Dimensions of organizational agility from selected reviewed articles
Source: Own compilation

Source	**Dimensions**
Chakravarty et al. (2013)	1. Entrepreneurial agility 2. Adaptive agility
Lee et al. (2015)	1. Proactiveness 2. Radicalness 3. Responsiveness 4. Adaptiveness
Lee et al. (2016)	1. Operation-level agility 2. Strategic-level agility
Lu and Ramamurthy (2011)	1. Market-capitalizing agility 2. Operational adjustment agility
Panda and Rath (2016)	1. Business process agility 2. Market responsive agility
Park et al. (2017)	1. Sensing agility 2. Decision-making agility 3. Acting agility
Ravichandran (2018)	1. Customer responsiveness 2. Operational flexibility 3. Strategic flexibility
Sambamurthy et al. (2003)	1. Customer agility 2. Partnering agility 3. Operational agility
Shan et al. (2020)	1. Hyperawareness 2. Informed decision-making 3. Fast execution

Organizational performance: a further point of interest in reviewing the articles was to examine the impact on organizational performance. The DC concept attributes agile organizations the capability to reconfigure their resources, which subsequently can lead to competitive advantages, and, in turn, positively impacts organizational performance. Therefore, one can expect performance to play a central role in literature on organizational agility.

Organizational performance is a central concept of interest in strategic management research in general. Also, in organizational agility research, organizational performance can be seen as a central goal of organizations: There is a large consensus that agility serves as a means to the end organizational performance. Agility, therefore, can be understood as an antecedent of the dependent variable performance. However, there is some discussion among scholars about what organizational performance is and what aspects of performance are important in this context. In general, there are two broad categories of organizational performance that can be distinguished: Financial performance, which focuses on financial aspects of this performance (*e.g.* sales growth, profitability, and earnings per share), and operational performance, which comprises operational performance aspects (*e.g.* market share, product quality, and marketing effectiveness) (Kurniawan et al. 2020). Another classification that is used for organizational performance is to distinguish between short-term and long-term performance (Kuilboer et al. 2016).

Ambidexterity: There is a consensus that ambidexterity comprises exploration and exploitation. Exploration can be understood in terms of new product development, experimenting with new ideas, and the development of new capabilities. Exploitation on the other hand refers to stability, efficiency, and continuous improvement of existing operations. The concept of ambidexterity has been subject to different research areas, for example organizational learning (*e.g.* Kane and Alavi 2007), business transformation (*e.g.* Leonhardt et al. 2017), innovation (*e.g.* Benitez et al. 2018), new product development (*e.g.* Syed et al. 2020), quality management (*e.g.* Moreno Luzon and Valls Pasola 2011), information technology (*e.g.* Zhen et al. 2021), and sustainability (*e.g.* Peng et al. 2019).

With respect to organizations, ambidexterity can be understood as an organizational capability to engage in incremental as well as discontinuous innovation endeavours at the same time (Tushman and O'Reilly 1996). Moreno Luzon and Valls Pasola (2011) refer ambidexterity to the capability to simultaneously execute two different actions. Effective organizations need to be able to balance both strategies (Rivkin and Siggelkow 2003).

The need to pursue two conflicting strategies simultaneously can lead to tension within organizations. Ambidexterity refers to the capability to cope with this tension. Clauss et al. (2021) emphasize this perspective and describe ambidexterity as the organizational capability to pursuing existing business operations efficiently (exploitation) while, simultaneously engaging in rising opportunities and radical innovation endeavours (exploration).

3 Research model development

Knowledge plays a central role in organizational learning. To make use of this resource, organizations apply different knowledge processes. This thesis focuses on ambidexterity, in particular exploration and exploitation strategies. Prior research has emphasized the role of ambidexterity in uncertain environments. For example, North and Kumta (2018) elaborate on the importance of pursuing conflicting strategies for exploration and exploitation for organizational success under environmental uncertainty. Organizations capable of managing the tension are likely to gain competitive advantages; therefore, ambidexterity can play a major role in the agility of organizations. Against this background, this thesis argues that enterprises need to engage in exploration and exploitation strategies to ensure the use of knowledge from both outside and inside the organization. It can be assumed that this knowledge can serve as a basis for managerial decisions. These decisions can lead to the reconfiguration and reallocation of organizational capabilities and resources, leading to the development of new capabilities (O'Reilly and Tushman 2013), in this context: Organizational agility.

This thesis proposes that organizations that are ambidextrous, simultaneously pursue both incremental as well as discontinuous innovation and change (Tushman and O'Reilly 1996), are capable of anticipating opportunities that arise in their environment (*e.g.* Lee et al. 2007). On the one hand, such organizations are able to more frequently sense such opportunities (Cadden et al. 2022) and therefore actively capitalize on them (Teece et al. 2016), thereby developing entrepreneurial agility. This thesis hypothesizes:

H1 (+): Ambidexterity positively impacts on entrepreneurial agility.

On the other hand, ambidextrous organizations can use knowledge (Roldan Bravo et al. 2018) to shift organizational resources in such a way to passively respond to environmental changes (Dubey et al. 2018). This allows such organizations to avoid or mitigate threats from their environment (Teece et al. 2016), thereby developing adaptive agility. Thus, this thesis hypothesizes:

H2 (+): Ambidexterity positively impacts on adaptive agility.

Agility helps organizations to quickly shift their internal resources to cope with different environmental conditions, thus enabling them to sense and seize opportunities and transform them accordingly. Therefore, agility should positively affect organizational performance (Alfalla-Luque et al. 2023; Cegarra-Navarro et al. 2016; Nejatian et al. 2018). This thesis argues that organizational agility leads to increased performance through two mechanisms. First, entrepreneurial agility enables organizations to harness opportunities or even create new ones.

Such opportunities can lead to a competitive advantage and boost organizational performance. Second, adaptive agility involves avoiding threats and transforming, thus making organizations more resilient to harmful external impacts. Increased resilience can also lead to improved organizational performance. Thus:

H3 (+): Entrepreneurial agility positively influences organizational performance.
H4 (+): Adaptive agility positively influences organizational performance.

This thesis aims to test the ambidexterity hypothesis with respect to agility to see if agility mediates the effect of ambidexterity on organizational performance. As Rungtusanatham et al. (2014) recommend, mediation effects should explicitly be hypothesized before testing and drawing conclusions about them. The direct effect of the exogenous on the final endogenous variable should be hypothesized as well when testing if this relationship is mediated by one or more variables (Rungtusanatham et al. 2014). Therefore, this thesis also hypothesizes for a direct effect of ambidexterity on performance. Prior research suggests that ambidextrous firms directly experience higher levels of performance (*e.g.* He and Wong, 2004; Kafetzopoulos et al., 2023; Peng et al., 2019). Such performance can be attributed to firms' capability to balance strategies that target exploitation and exploration, thereby integrating radical as well as incremental innovation efforts. Thus, this thesis hypothesizes:

H5 (+): Ambidexterity has a positive effect on organizational performance.

H1-H5 describe the main hypotheses of this thesis and describe that the direct effect of ambidexterity on performance (H5) is mediated *via* two mechanisms: 1) The effect of ambidexterity on entrepreneurial agility (H1) and the effect of entrepreneurial agility on organizational performance (H3). 2) The effect of ambidexterity on adaptive agility (H2) and the effect of adaptive agility on organizational performance (H4).

In addition to the direct and mediation effects, the moderating effects are developed in the following, starting with the moderating role of ESM use. ESM allow for an easy communication and collaboration among employees. This thesis draws on the publication by Leonardi (2014) and argues that ESM use makes employee conversations about exploration and exploitation operations visible. It helps spreading this knowledge across organizations and enables free information flow between employees. With respect to knowledge management, ESM can capture tacit knowledge - a major challenge for traditional KMS (Antonius et al. 2014). Tacit knowledge also has been linked to the development of dynamic capabilities (*e.g.* Teece 2009). This form of knowledge is closely linked to persons and specific contexts – making its coding and communication a challenge (Nonaka and Takeuchi 1995). Such properties allow organizations to make use of it and gain a competitive edge. This tacit knowledge can serve as a major asset, is its traits make it hard to codify and transfer it. Therefore, it cannot be easily transferred to

competitors. Tacit knowledge can impact managerial decisions about organizational resource use, thus leading to the creation of organizational agility. This thesis hypothesizes that tacit knowledge takes on an important role in developing organizational agility and that ESM can help disseminate tacit knowledge particularly well. With this capability to disseminate tacit knowledge, ESM use may also positively influence the relationship between ambidexterity and performance. This thesis hypothesizes:

H6 (+): The positive effect of ambidexterity on entrepreneurial agility is positively moderated by ESM use.

H7 (+): The positive effect of ambidexterity on adaptive agility is positively moderated by ESM use.

H8 (+) The positive effect of ambidexterity on organizational performance is positively moderated by ESM use.

In competitive environments, firms face extreme competition such as cost pressures and the need to respond to changing market conditions (Matusik and Hill 1998). In these environments, firms' behavior often depends on their competitors' behavior. Firms monitor their competitors' actions to quickly adapt to relevant developments and to create competitive advantages (Ahammad et al. 2021). Facing competitive pressures, firms need to rely on both exploration and exploitation strategies to develop organizational capabilities for survival. Ambidextrous organizations rely on both exploration and exploitation strategies, which enables them to create opportunities and develop entrepreneurial agility, as well as respond to changes in the environment and develop adaptive agility. Furthermore, a balance between exploration and exploitation under environmental competitiveness is likely to increase organizational performance. Thus:

H9 (+): The positive effect of ambidexterity on entrepreneurial agility is stronger under higher degrees of environmental competitiveness.

H10 (+): The positive effect of ambidexterity on adaptive agility is stronger under higher degrees of environmental competitiveness.

H11 (+): The positive effect of ambidexterity on organizational performance is stronger under higher degrees of environmental competitiveness.

An increasing number of organizations tends use knowledge as the primary means of production (Drucker 1993). Compared with less knowledge-intensive organizations, which can rely on a variety of resources, organizations in knowledge-intensive industries are dependent on knowledge resources; that is, they are typically characterized by higher degrees of knowledge intensity. Both external and internal knowledge is required for managerial decisions that allow for the development of agility. Thus, this thesis expects that ambidexterity has a stronger effect on

organizational agility when knowledge intensity is greater. Following the same argument, one can assume that the effect of ambidexterity on organizational performance is also stronger with increased knowledge intensity. This thesis hypothesizes:

H12 (+): The positive effect of ambidexterity on entrepreneurial agility is stronger for higher levels of knowledge intensity.

H13 (+): The positive effect of ambidexterity on adaptive agility is stronger for higher levels of knowledge intensity.

H14 (+): The positive effect of ambidexterity on organizational performance is stronger for higher levels of knowledge intensity

Figure 4 displays the research model for this thesis.

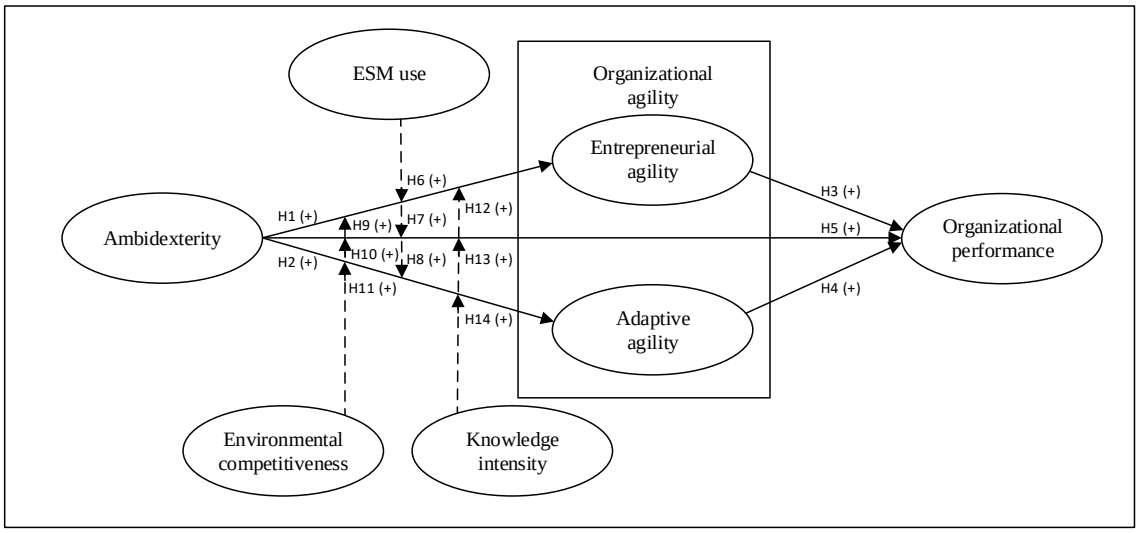


Figure 4: Research model
Source: Own compilation

Table 2 shows a comprehensive list of the items used to measure ambidexterity, entrepreneurial agility, adaptive agility, organizational performance, ESM use, environmental competitivity, and knowledge intensity.

Table 2: Items of the constructs of the research model

Construct	Abbr.	Operationalization		Scale	Source
Ambidexterity		Please indicate how your company has split its focus among the following opposites within the last three years. Both percentage inputs need to add up to 100%.		100% scale; 100% are to be split among the dual items for exploitation and exploration.	Adapted from He and Wong (2004)
		Exploitation:	**Exploration:**		
	Amb1	… has developed incrementally new products and services.	… has developed radically new products and services.		
	Amb2	… has maintained or even reduced the product and services range.	… has extended the product and services range.		
	Amb3	… has addressed existing customer markets.	… has addressed new customer markets.		
	Amb4	… has relied on well-established technologies.	… has relied on new technologies.		
	Amb5	… has improved product and service quality at existing initiatives.	… has started new initiatives even at the risk of reduced product or service quality.		
	Amb6	… has improved production flexibility at existing initiatives.	… has started new initiatives even at the risk of reduced production flexibility.		
	Amb7	… has reduced production cost at existing initiatives.	… has started new initiatives even at the risk of increasing production cost.		
	Amb8	… has reduced resource consumption at existing initiatives.	… has started new initiatives even at the risk of increased resource consumption.		
Organizational agility		Please indicate on a 1 to 7 scale (1 = not at all true; 7 = very true) how you would agree to the following statements with respect to your company.		Seven-point Likert scale	Adapted from Chakravarty et al. (2013)
		Entrepreneurial agility:			
	EA1	We are able to anticipate change.			
	EA2	We are able to capitalize on opportunities as they occur.			
	EA3	We are able to implement organizational change, akin to being able to respond to opportunities.			
	EA4	We are able to respond to opportunities by making strategic modifications.			
		Adaptive agility:			
	AA1	We are able to protect or buffer the firm from various disruptive forces.			
	AA2	We are able to correct for disruptions without major changes in normal activities.			
	AA3	We are able to withstand environmental disruption, akin to buffering itself.			
	AA4	We are able to withstand disruptive factors, synonymous with both buffering against disruptive factors and correcting for disruptive factors without significant strategic changes.			

Construct	Abbr.	Operationalization	Scale	Source
Organizational performance		Please indicate on a 1 to 7 scale (1 = not at all true; 7 = very true) how you would agree to the following statements with respect to your company.	Seven-point Likert scale	Adapted from Cegarra-Navarro et al. (2016)
		Compared to our most important competitors …		
	OP1	… we offer services of better quality.		
	OP2	… we have more efficient internal processes.		
	OP3	… we are more efficient with regard to the use of resources.		
	OP4	… we have more satisfied customers.		
	OP5	… we serve customers more quickly.		
	OP6	… our company is growing more.		
	OP7	… our company is more profitable.		
	OP8	… our company is more productive.		
ESM use		Please indicate on a 1 to 7 scale (1 = not at all true; 7 = very true) how you would agree to the following statements with respect to your company.	Seven-point Likert scale	Adapted from Foltean et al. (2019)
	ESMU1	My company uses enterprise social media to share content between employees.		
	ESMU2	My company uses enterprise social media to create conversations among employees.		
	ESMU3	My company uses enterprise social media to create social relationships among employees.		
	ESMU4	My company uses enterprise social media to manage communities of employees.		
Environmental competitiveness		Please indicate on a 1 to 7 scale (1 = not at all true; 7 = very true) how you would agree to the following statements with respect to your company.	Seven-point Likert scale	Adapted from Jansen et al. (2006)
	EC1	Competition in our local market is intense.		
	EC2	Our organizational unit has relatively strong competitors.		
	EC3	Competition in our local market is extremely high.		
	EC4	Price competition is a hallmark of our local market.		
Knowledge intensity	KI	All in all, my company can be characterized as knowledge-intensive.	Seven-point Likert scale	Adapted from Smith (2002)

4 Data collection and PLS-SEM path model estimation

For this research, executives of different organizations operating in German-speaking countries were asked to participate as they would have a good overview on their organizations and would be able to provide valid answers to the questionnaire. In cooperation with a professional panel provider, participants from organizations of 250 or more employees were asked to participate, as such organizations likely would have enough resources to engage in ambidexterity strategies (exploration and exploitation) and likely would also use ESM for internal communication purposes. The data collection process took place in December 2022 in the course of two weeks. In total, 200 respondents completed the questionnaire. This corresponds to a completion rate of 35.4%[1]. Figure 5 illustrates the number of participants in the data collection process. The average time (arithmetic mean) to complete the questionnaire was 9 minutes and 50 seconds.

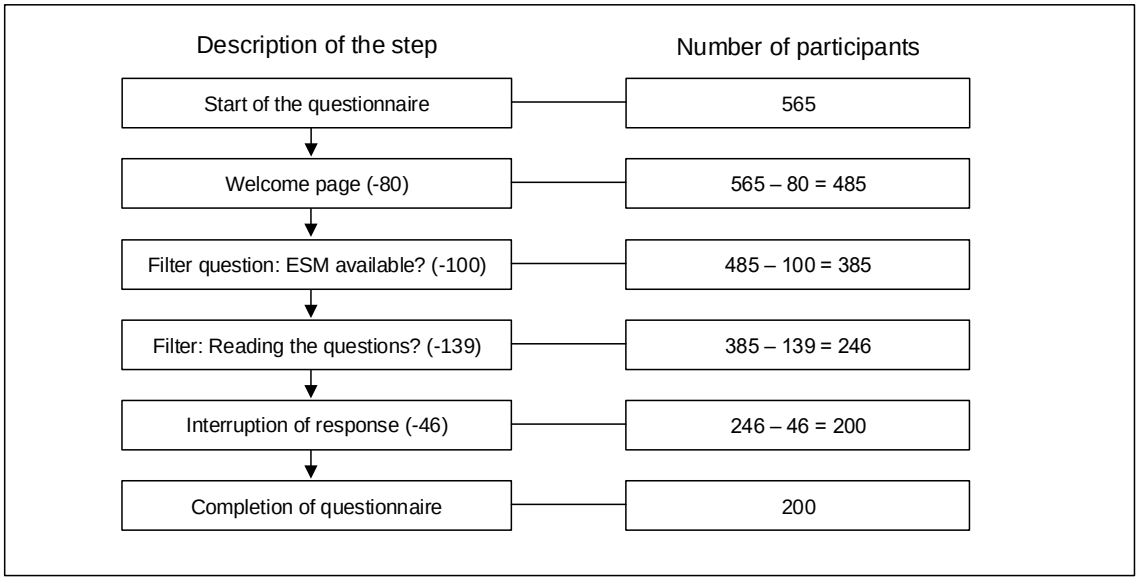


Figure 5: Overview on the number of participants in the data collection process
Source: Own compilation

Table 3 shows what insustries are represented among the participants.

[1] 200 / 565 = 0.354

Table 3: Overview on industries represented in the sample
Source: Own compilation

Industry	**Number of enterprises in the sample**
Construction	8
Mining	0
Services	38
Hospitality	3
Health and social services	17
Real estate and housing	1
Trade	21
Crafts	3
Information and communication	17
Arts, entertainment, and recreation	4
Agriculture and forestry, fisheries	0
Manufacturing industry	37
Infrastructure	4
Other	47
	∑ 200

The results of the path coefficient calculation of the direct effects in the model show that ambidexterity has a significant, positive impact on entrepreneurial agility (0.145) and adaptive agility (0.304), supporting H1 and H2. Entrepreneurial and adaptive agility, in turn, positively affect organizational performance (0.543 and 0.249), supporting H3 and H4. The direct effect of ambidexterity on organizational performance (H5) has a path coefficient of 0.065.

In addition to the hypothesized direct effects, this thesis went on to analyse the hypothesized moderating effects. The analysis reveals three negative, non-significant path coefficients for the moderator ESM use: -0.183 (p°= 0.096 → not significant (ns)) for its impact on the relationship between ambidexterity−entrepreneurial agility (H6), -0.213 (p°= 0.057 → ns) for the relationship between ambidexterity−adaptive agility (H7), and -0.069 (p°=0.243 → ns) for the relationship ambidexterity−organizational performance (H8).

With respect to the moderating impact of environmental competitiveness, the analysis shows a mixed result in terms of significance. The path coefficients for its impact on the relationship between ambidexterity−entrepreneurial agility (H9) is 0.163 (p°= 0.057 → ns) for the relationship between ambidexterity−adaptive agility (H10) is 0.266 (p°= 0.009), and for the relationship between ambidexterity−performance (H11) is -0.21 (p°= 0.747 → ns).

For the moderator knowledge intensity, a mixed result was revealed again. It shows two positive, significant path coefficients and a negative, not significant effect. Its impact on the relationship between ambidexterity−entrepreneurial agility has a path coefficient of 0.169 (p°= 0.021); its impact on the relationship between ambidexterity−adaptive agility shows a path coefficient of 0.183 (p°= 0.012); and its impact on the relationship between ambidexterity and organizational performance is -0.13 (p°= 0.838).

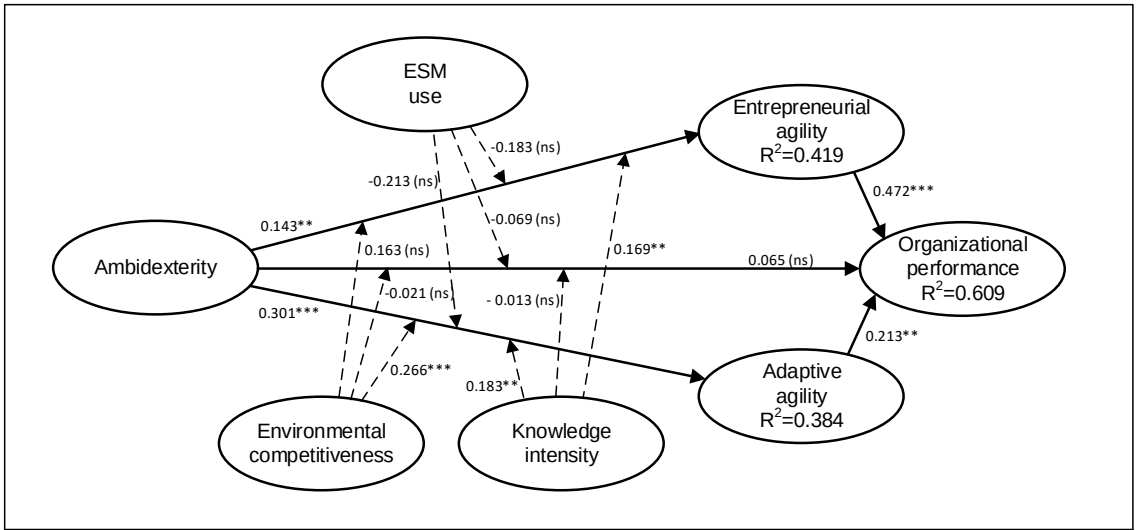
After the path coefficients were determined, the model's explanatory power was assessed. This was conducted by calculating the coefficients of determination (R^2). The R^2 values can be interpreted as a measure of in-sample predictive power (Hair et al. 2022). The coefficients

of determination range between 0 and 1, with higher numbers representing greater levels of explanatory power. Entrepreneurial agility shows an R^2 value of 0.419. Adaptive agility has an R^2 value of 0.384. This means that ambidexterity together with the moderators explain 41.9% of the variation of entrepreneurial agility and 38.4% of the variation in adaptive agility. Both agility constructs, in turn, explain 60.9% of the variance of organizational performance ($R^{2\circ}$= 0.609). Table 4 reports the R^2 values as derived from SmartPLS°4.

Table 4: Results of the calculation of the R^2 values in the research model
Source: Own compilation based on results derived from SmartPLS°4

	R^2
Entrepreneurial agility	0.419
Adaptive agility	0.384
Organizational Performance	0.609

Figure 6 shows the results of the PLS-SEM analysis (R^2 values, path coefficients, and significance levels).



Explanation:

⬭	Black oval circles represent latent variables.
⟶	Continuous arrows visualize the (hypothesized) relationship between two variables or between a variable and an indicator.
– – –►	Dashed arrows visualize the (hypothesized) impact of a moderating variable.
R^2	R^2 values describe the amount of explained variance in a variable.
(-)0.xx	Numbers next to arrows represent path coefficients.
**	Two asterisks mark a path coefficient that is significant on the 0.05 level.
***	Three asterisks mark a path coefficient that is significant on the 0.01 level.
(ns)	The letters „ns“ mark a path coefficient that is neither significant on the 0.05 nor the 0.01 level.

Figure 6: Research model with R^2 values, path coefficients, and significance levels
Source: Own compilation based on results derived from SmartPLS°4

Table 5 shows which of the hypotheses of this thesis are supported by the results of the analysis.

Table 5: Overview on confirmed hypotheses of this thesis
Source: Own compilation based on results derived from SmartPLS°4

Hypothesis	Relationship	Hypothesis confirmed?
H1	Ambidexterity → Entrepreneurial agility	✓
H2	Ambidexterity → Adaptive agility	✓
H3	Entrepreneurial agility → Organizational performance	✓
H4	Adaptive agility → Organizational performance	✓
H5	Ambidexterity → Organizational performance	X
H6	ESM use * ambidexterity → Entrepreneurial agility	X
H7	ESM use * ambidexterity → Adaptive agility	X
H8	ESM use * ambidexterity → Organizational performance	X
H9	Environmental competitiveness * ambidexterity → Entrepreneurial agility	X
H10	Environmental competitiveness * ambidexterity → Adaptive agility	✓
H11	Environmental competitiveness * ambidexterity → Organizational performance	X
H12	Knowledge intensity * ambidexterity → Entrepreneurial agility	✓
H13	Knowledge intensity * ambidexterity → Adaptive agility	✓
H14	Knowledge intensity * ambidexterity → Organizational performance	X

5 Discussion and conclusion

This thesis set out to examine the agility construct in an organizational learning context. In particular, the results have shown that ambidexterity is a predictor of agility and drives entrepreneurial as well as adaptive agility. Prior research has examined the impact of ambidexterity on agility largely in an information systems context (*e.g.* Lee et al. 2007; Zhen et al. 2021; Zhou et al. 2018). The analysis of the main research model has confirmed a positive ambidexterity effect on agility in a broader business context. Both agility constructs, in turn, drive organizational performance with entrepreneurial agility having a stronger effect than adaptive agility. This result confirms prior research on the agility−performance relationship (*e.g.* Alfalla-Luque et al. 2023; Cegarra-Navarro et al. 2016; Nejatian et al. 2018). All in all, the analysis finds significant, positive effects that confirm the hypothesized main relationships (H1-H4). As the direct effect of ambidexterity on organizational performance is not significant (H5), the effect of

ambidexterity on performance is fully mediated by both agility constructs. These results are in contrast to prior publications on the effect of ambidexterity on organizational performance (*e.g.* He and Wong 2004; Kafetzopoulos et al. 2023; Peng et al. 2019). The results of this thesis suggest that the performance effect of ambidexterity in indirectly via the agility construct. These results lead to the question, if the examinations of the mentioned publications may also be indirect via relevant organizational capabilities. Additional research in different research settings is desirable to confirm the results of this thesis.

With respect to the moderating effects, the analysis showed a mixed picture. First, none of the hypothesized moderating effects of ESM use (H6-H8) were confirmed in the initial model. In lack of prior studies on that topic, this is an important result on the role of ESM use in the development of organizational agility. However, the analysis of the alternative research model confirms that ESM use impacts on both agility constructs. However, ESM platforms seem not to transport knowledge that refers to ambidexterity for supporting agility. One possible explanation for the direct effect of ESM use on agility is that ESM use support the dissemination of tacit knowledge that may fuel managerial decisions on the deployment of organizational resources that can lead to the development of agility. This result is important as it suggests that the use of ESM platform can actually have measurable organizational effects. ESM are not just simple communication platform but their use can make organizations become agile and lead to desirable effects such as performance. They may offer a way to secure organizational survival and a base for organizational thriving.

Second, environmental competitiveness has been found to moderate the ambidexterity−adaptive agility relationship, but not the ambidexterity−entrepreneurial agility or the ambidexterity–performance relationship, thus H11 was confirmed and H9 and H10 rejected. This insight contributes to research on the development of agility under VUCA conditions (*e.g.* Chakravarty et al. 2013; Mao et al. 2015; Panda and Rath 2018a). These results show that environmental competitiveness is especially important when it comes to the development of the passive agility aspect (adaptive agility). It plays a minor role with respect to the active aspect (entrepreneurial agility) in the current research setting.

Third, knowledge intensity has been shown to positively moderate the effect of ambidexterity on both agility constructs but not on organizational performance, hypotheses H12 and H13 were supported and H14 rejected. These results confirm the related moderating effect of information intensity on the KMCs−agility relationship reported by Mao et al. (2015). The examination of the presence of unobserved heterogeneity in the data with negative outcome has indicated that the results are robust.

All in all, organizational agility seems to be a vibrant topic that has gained popularity in operations management research in recent years. The number of research papers on this topic underline its importance (*e.g.* Junni et al. 2013; Tallon et al. 2019; Walter 2020).

This thesis offers a set of substantial implications for practice. First, it offers practitioners insights into how to leverage organizational learning to develop agility. The findings indicate that both exploration and exploitation strategies are relevant in this regard.

Second, the research finds that ambidextrous (balanced) organizations achieve higher levels of agility and thereby provides a clear indication on how they can invest their financial resources to further develop their agility capability. It has provided empirical support for the ambidexterity hypothesis. This is a finding suggesting that executives should strive to balance out exploration and exploitation strategies if they aim for achieving agility and increased organizational performance. Also, organizations can draw on the items of the proposed measurement model to understand which factors shape ambidexterity. Practitioners can deduce specific innovation strategies to maximize ambidexterity and make use of the insights to facilitate the development of their organizations' agility.

Third, the thesis offers recommendations for executives on how to cope with VUCA conditions: By developing organizational agility. Its insights on how organizational agility mediates the relationship between ambidexterity and performance can be used to design appropriate strategies for exploration and exploitation that facilitate agility. Both agility dimensions (active as well as passive) can make a significant contribution to organizational performance. This is the basis for thriving under intense competition. Furthermore, the stronger impact on adaptive agility suggests that ambidexterity is an effective solution to build resilience against the frequent disruptions that are posing increasingly more challenges on company operations and supply chains throughout the world.

Fourth, as the research model was tested with data from a wide range of industries, the results are based upon a robust sample distribution. Additionally, the PLS-SEM analysis has shown that the research model has good predictive power. This means that its results can be well generalized (out of sample prediction). The results of the PLS-SEM analysis also show how the effects are contingent on environmental competitiveness and knowledge intensity, allowing executives to account for these moderation effects. The thesis reveals that the role of ambidexterity in dealing with these disruptions (*i.e.* adaptive agility) increases with rising levels of environmental competitiveness. With rising degrees of knowledge intensity, the effects of ambidexterity on both agility dimensions increase.

Fifth, while ESM use seems to not facilitate the effect of ambidexterity, the thesis offers a hint to the positive effect of ESM use on the development of agility. Accelerated by the COVID-19 pandemic, many organizations have been reinforcing their efforts to use ESM for internal purposes. While concerns have been voiced that ESM use can result in a waste of time (*e.g.* Lardon-Lopez et al. 2022), desirable effects on organizational variables like agility have remained unknown. This thesis now indicates that ESM use indeed can facilitate positive organizational outcomes, specifically the development of agility.

Sixth, specifically the results of the IPMA may serve to deduct und prioritize executive actions to drive organizational performance. The results have revealed that activities facilitating

the development of adaptive agility as well as entrepreneurial agility are particularly important for optimizing organizational performance.

To summarize, this thesis offers four main contributions. First, it shows that agility mediates the ambidexterity−performance relationship. This is a crucial discovery of this thesis, as it challenges the established ambidexterity−performance relationship that is established in papers on the ambidexterity hypothesis. The results of this thesis show that this effect is more comprehensive. Ambidexterity drives organizational performance indirectly via entrepreneurial and adaptive agility. Second, it proposes an alternative measurement model for the ambidexterity construct. This is an important contribution to organizational ambidexterity research as it offers a measurement model of ambidexterity that allows for capturing the tension aspect of ambidexterity that seems to have been neglected in prior research. This new measure provides an additional perspective on the ambidexterity construct and paves the way for further examinations of the phenomenon. Third, it examines the role of ESM use in the ambidexterity−agility relationship. While the initial hypothesis of ESM use as a moderator of the ambidexterity−agility relationship was not supported by the data, the analysis of the alternative research model has shown that ESM use exerts a direct effect on the development of organizational agility. This is a crucial result for ESM research, as it confirms that the use of such platforms can have important organizational effects. As it drives organizational agility, establishing ESM platforms can be an important strategic effort in organizations. Fourth, it shows how environmental competitiveness and knowledge intensity moderate the effect of ambidexterity on agility. These results suggest that the hypothesized effects are contingent on environmental conditions as well as organizational characteristics. These insights can be used to tailor the main effects to specific organizational conditions.

Overall, this thesis advances the knowledge on organizational agility and the nature of ambidexterity. As such, the thesis helps to fill several important gaps in the literature. With its several contributions, this thesis contributes to operations management research and paves the way for in-depth examinations of the relations between ambidexterity, organizational agility, and performance.

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