Business model innovation decisions: the role of group biases and risk willingness

Sarah Mueller-Saegebrecht
Faculty of Business and Economics, Dresden University of Technology, Dresden, Germany

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Abstract

Purpose – Managers must make numerous strategic decisions in order to initiate and implement a business model innovation (BMI). This paper examines how managers perceive the management team interacts when making BMI decisions. The paper also investigates how group biases and board members' risk willingness affect this process.

Design/methodology/approach – Empirical data were collected through 26 in-depth interviews with German managing directors from 13 companies in four industries (mobility, manufacturing, healthcare and energy) to explore three research questions: (1) What group effects are prevalent in BMI group decision-making? (2) What are the key characteristics of BMI group decisions? And (3) what are the potential relationships between BMI group decision-making and managers' risk willingness? A thematic analysis based on Gioia's guidelines was conducted to identify themes in the comprehensive dataset.

Findings – First, the results show four typical group biases in BMI group decisions: Groupthink, social influence, hidden profile and group polarization. Findings show that the hidden profile paradigm and groupthink theory are essential in the context of BMI decisions. Second, we developed a BMI decision matrix, including the following key characteristics of BMI group decision-making managerial cohesion, conflict readiness and information- and emotion-based decision behavior. Third, in contrast to previous literature, we found that individual risk aversion can improve the quality of BMI decisions.

Practical implications – This paper provides managers with an opportunity to become aware of group biases that may impede their strategic BMI decisions. Specifically, it points out that managers should consider the key cognitive constraints due to their interactions when making BMI decisions. This work also highlights the importance of risk-averse decision-makers on boards.

Originality/value – This qualitative study contributes to the literature on decision-making by revealing key cognitive group biases in strategic decision-making. This study also enriches the behavioral science research stream of the BMI literature by attributing a critical influence on the quality of BMI decisions to managers' group interactions. In addition, this article provides new perspectives on managers' risk aversion in strategic decision-making.

Keywords Business model innovation decisions, Cognitive biases, Group biases, Managerial interaction, Risk willingness, Thematic analysis

Paper type Original article

1. Introduction

In this paper, we aim to explore how managing directors interact as a group when they make strategic business model innovation (BMI) decisions. More specifically, we examine how group biases and board members' risk willingness affect this process. Although managers strive to use their collective intelligence in their decision-making process (Ahmadzadeh *et al.*, 2022), their "bounded rationality" influences their strategic decisions (Cyert and March, 1963; Simon, 1993). Based on their prior knowledge and experience (Dane and Pratt, 2007), executives intuitively use cognitive heuristics (Norris *et al.*, 2020) and encounter cognitive

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limitations at the individual and group level (Cristofaro, 2016; Schneckenberg *et al.*, 2017). This article addresses group-level cognitive biases that hinder strategic decision-making. Even when groups apply the recommended discussion techniques (Brodbeck *et al.*, 2007; Lu *et al.*, 2012), they may lack decision quality (Bang and Frith, 2017). As explained in the theory of groupthink by Janis (1982), decision-making errors in groups are mainly based on groupthink arising from the interaction of multiple decision-makers. Groupthink is likely to occur when several conditions coincide, such as a high degree of unity within a group, directive leadership, ineffective information search and analysis and high stress situations in which there is little hope for better solutions (Janis, 1982; Leana, 1985). Due to groupthink, groups search for information inadequately and do not analyze risks appropriately. In decision-making processes, managers are biased when it comes to managing available information and considering other alternatives. To date, many studies have shown that groups do not share information and knowledge sufficiently (e.g. He *et al.*, 2021; Silva de Garcia *et al.*, 2022; Goncalves *et al.*, 2023).

Group biases are a challenge when a board of directors needs to innovate a company's business model (BM), which describes how a company makes money (Magretta, 2002). Although several scholars have addressed the BM phenomenon in recent years, they have not yet agreed on a comprehensive definition (Perkmann and Spicer, 2010). Indeed, different BM research directions have emerged (Massa *et al.*, 2017; Hajiheydari *et al.*, 2019). While some scholars interpret BMs as an attribute of a firm (e.g. Chesbrough, 2010; Gambardella and McGahan, 2010; Zott and Amit, 2010), others understand BMs as a formal conceptual representation of a firm's activities (e.g. Casadesus-Masanell and Ricart, 2010; Teece, 2010; Schaltegger *et al.*, 2016) or a cognitive schema (e.g. Magretta, 2002; Doz and Kosonen, 2010; Martins *et al.*, 2015; see Massa *et al.*, 2017, for an excellent literature review). Like Bruni and Comacchio (2023), we adopt both the conceptual and cognitive perspectives on BMs in the following.

On the one hand, we consider BM as a description of how an organization creates, delivers and captures value, in line with scholars such as Teece (2010), Casadesus-Masanell and Ricart (2010) and Baden-Fuller and Haefliger (2013). The value capture perspective is necessary because it reveals the content of the decision-making process of a BMI. On the other hand, we treat BMs as cognitive schemas because schemas help to simplify and filter information to improve decision-making (Massa *et al.*, 2017). We know that a BM is not a real system, but an image of a real system that is shaped by the manager's cognitive schemas (Tripsas and Gavetti, 2000; Chesbrough and Rosenbloom, 2002). In this context, there is already intensive research on the interpretation of a firm's BM by its organizational members and the manifestation of BMs in social interaction (Massa *et al.*, 2017), such as cognitive antecedents of BMI (Amit and Zott, 2015; Martins *et al.*, 2015), environmental scanning and opportunity recognition (Teece, 2007). Even though everyone has their own mental model of a BM (Bruni and Comacchio, 2023; Snihur and Eisenhardt, 2022), individuals share their beliefs and influence each other. In this way, narratives help them to create a shared understanding of an existing BM. However, it remains unclear how the interactions between organizational members can influence the collective cognitive schema of a company's BM, especially when the BM needs to be changed (Snihur and Eisenhardt, 2022). This is problematic because disagreement among board members about the cognitive schema of a new BM may hinder the implementation of a BMI. In our paper, we shed light on this blind spot by examining how managing directors interact in the BMI decision-making process and how their collective cognitive schema changes when the BM needs to be adjusted.

While there is already a large body of BM literature, the BMI research field is younger and less explored (Björkdahl and Holmén, 2013; Hossain, 2017; Hollebeek *et al.*, 2022). However, it is developing literally as the "new strategy arena" (Ricart, 2023). The BMI literature adds the innovation perspective to the BM construct and consequently raises new questions for

researchers and practitioners. Foss and Saebi (2017) state that BMI studies adopt either a static or a dynamic perspective and divide the existing BMI literature into four streams of research: (1) literature that conceptualizes BMI, (2) literature that illustrates the consequences of BMI and (3) literature that frames BMI as an organizational outcome or (4) as an organizational process. The first line of research provides definitions and BMI conceptualizations (e.g. Teece, 2010; Amit and Zott, 2012), while the organizational consequences of a BMI, such as measuring organizational performance or defining organizational implications, form the core of the second category of research (e.g. Aspara *et al.*, 2010; Bock *et al.*, 2012). Unlike the third line of research, which is more descriptive in nature and examines new BM as a result of corporate change in different industries (e.g. Sánchez and Ricart, 2010; Abdelkafi *et al.*, 2013) or different BM types (e.g. Matzler *et al.*, 2013), the fourth category of research treats BMI as an organizational change process that includes capabilities and learning mechanisms necessary for successful BMI implementation. These studies describe BMI as a dynamic change process that requires different organizational capabilities (e.g. Doz and Kosonen, 2010; Achtenhagen *et al.*, 2013), such as experimentation and learning (e.g. Eppler *et al.*, 2011; Andries *et al.*, 2013) or process evaluation (e.g. Gilsing *et al.*, 2022). Some of these works propose different BMI process models (e.g. Andreini *et al.*, 2022; De Reuver *et al.*, 2013; Frankenberger *et al.*, 2013).

Just a decade ago, Schneider and Spieth (2013) postulated in this fourth area of research that organizations still have a long way to go and need to further improve our understanding of the BMI process and its enablers and effects in anticipation. To investigate the BM development and determine priorities between BMI enablers and barriers, Vatankhah *et al.* (2023) have recently applied complexity theory and the related concept of hierarchy. Saebi *et al.* (2017) confirmed the lack of knowledge about the BMI process in general and call for more qualitative study, particularly using interview-based data to better determine the drivers of the BM adaptation process. Bock *et al.* (2012), Wittig *et al.* (2017) and Hock *et al.* (2016) agreed and pointed out that there is a lack of empirical studies in this field. They emphasize the need for more work that empirically examines the importance of organizational culture for the BMI process. Additionally, there is a lack of studies that empirically explore how organizational culture shapes behavioral patterns and how organizational culture influences interactions between organizational members (Shin *et al.*, 2012). Our work aims to contribute to closing these gaps by examining how managing directors as a group make BMI decisions and how they interact within this innovation process. In doing so, we intend to enrich the fourth BMI research direction by providing new insights into what capabilities managing directors consider necessary for group of decision-makers. Using the dynamic managerial capabilities lens, Heubeck and Meckl (2022, p. 2441) stated that "decision-making regarding business model innovation is the outcome of how managers cognitively process information". Besides this capabilities perspective, in our paper we investigate the interplay of emotions and information within decision-making groups and extend earlier findings by Deschamps (2005), who notes the importance of information sharing and risk-taking for an open-minded organizational culture as a prerequisite for successful BMI. Recently, Andersen *et al.* (2022) contributed to this debate. They considered decision-making as a combination of intuition and data analysis as among the four critical BMI process activities and provided insights that tie in well with our findings. In contrast, Andersen *et al.* (2022) and Korherr *et al.* (2022) identified a shift from intuitive to data-driven decision-making among top managers. In this context, Korherr *et al.* (2022) identified four managerial archetypes that all seem important in manifesting information analytics in organizations: the analytical thinker, the coach, the guide and the strategist. Based on interview data, Korherr *et al.* (2022) deduced distinct criteria that describe the four archetypes. However, it cannot be concluded from these criteria how risk-willing the four types are in decision-making.

The essence of BMI decisions are that they concern strategic issues that have a strong impact on the long-term success of a company and stakeholders. Changing basic elements of an existing BM has immense organizational consequences, especially if management makes the wrong decision. We treat BMI decisions as a particular form of strategic decision, specifically addressing Osterwalder's (2004) nine elements of a BM: Customer segment, value proposition, channels, customer relationships, revenue and cost streams, key resources, key activities and key partners. In comparison, Eisenhardt and Zbaracki (1992) define strategic decisions in a broader sense as frequent decisions made by the top executives of an organization that critically affect the well-being and survival of the organization. The focus of this article on decisions related to the typical nine elements of a BM allows us to present the latent construct of strategic decisions more succinctly. This helps practitioners to target innovation behavior rather than the overall corporate goal of improving competitiveness. Our approach is in line with the recently published work of Martínez-Velasco and Terán-Bustamante (2022) who show quantitatively that focusing on key elements that form a BMI is an efficient way to improve decision-making. This article is also a response to repeated requests from several BMI scholars to distinguish between BM and strategy (e.g. Teece, 2010; Markides, 2013; Bashir and Verma, 2019).

Strategic BMI decisions are associated with a high degree of risk and uncertainty (Taran *et al.*, 2019; Aagaard and Nielsen, 2021). Building on the effectuation theory of Sarasvathy and Kotha (2001), Karami *et al.* (2022) demonstrated that in an unpredictable world, decision-makers tend to rely on their existing resources to deal with uncertainty. If managers are not willing to accept a certain level of risk when making bold decisions, adapting an existing BM or even creating an entirely new BM is a challenge. In this sense, the literature states that managers' risk aversion can hinder successful BMI implementation (Chesbrough, 2010; Laukkanen and Patala, 2014). Executives rarely make strategic decisions independently, but in groups, influenced by group dynamics. Group members may differ in their risk-taking behavior and willingness to take risks (Arslan *et al.*, 2020). Executives may adopt a risk-averse, risk-neutral or risk-willing attitude. Based on group interactions, groups may make a riskier (risky shift) or less risky decision (cautious shift) than individuals (Zhang and Casari, 2012). In this sense, scholars disagree on whether groups or individuals are more risk averse (e.g. Baker *et al.*, 2008; Zhang and Casari, 2012). However, we still do not know how group interactions can change managers' risk willingness – and thus the outcome of strategic decisions that affect a company's BM. Moreover, it is not clear whether risk-averse decision-makers can discourage firms from making excessively risky decisions or whether they hinder BMI decision-making (Bocken and Geradts, 2020). Based on these different considerations, the following research questions are investigated in this paper:

RQ1. What group effects are prevalent in BMI group decision-making?

RQ2. What are the key characteristics of BMI group decisions?

RQ3. What are the potential relationships between BMI group decision-making and managers' risk willingness?

Empirical data was collected through 26 in-depth interviews with managers from thirteen companies in four industries: Mobility, Manufacturing, Healthcare and Energy. Since most strategic decisions are based on a consensus between two or more people (Cooper and Kagel, 2005), the research design included two managers in each of the thirteen companies to reflect different perspectives (Van Knippenberg and Schippers, 2007). The article applies a thematic analysis following the guidelines of Gioia (Gioia *et al.*, 2013) to identify key themes in the extensive qualitative data.

This study offers interesting implications for both practitioners and researchers. It aims to educate managers about potential biases in BMI decision-making that may arise from the interaction of group members. Group members' ability to recognize group biases is

fundamental to improving the quality of their strategic decision-making processes (Bazerman and Moore, 2009; Cristofaro, 2016). Group interaction influences the decision outcome, which can help or hinder the implementation of BMI. Thus, biases in group decision-making can affect a company's market position and competitive position.

This study also aims to contribute to three different areas of research: *first*, this work aims to enrich the BM literature, especially the BM research field that conceptualizes BM as a cognitive schema. Using qualitative data, we aim to paint a clearer picture of how the social interaction of managing directors influences change in the collective cognitive schema of a company's BM. In doing so, we identify two key aspects that primarily accompany boards as they adjust their collective cognitive schema of the company's BM: managerial cohesion and managers' willingness to engage in conflict.

Second, we shed light on the BMI research field that views BMI as an organizational process. There has been little research on managerial interaction in BMI processes (Bashir and Verma, 2019). Only recently, Spieth *et al.* (2023) emphasized that the cognitive behaviors and the influence of individual and team characteristics on the BMI process remain unclear. The present study attempts to shed light on these blind spots by providing insights into the interaction of managing directors during the BMI process. We also identify four group biases that influence the BMI decision-making process and thus the outcome of the BMI decision. By conducting 26 in-depth interviews with managing directors, we also respond to the call for more interview-based data to better understand the BM adaptation process (Saebi *et al.*, 2017). Consequently, this paper aims to enrich the BMI literature also from a methodological perspective.

Using the BMI process perspective, we aim to better understand the role of risk and uncertainty, which are typical of BMI (Brillinger *et al.*, 2020). To date, the BMI literature has primarily focused on the organizational perspective of risk and has not examined how the individuals responsible for proposing or rejecting the initiation and implementation of BMI perceive these risks. In contrast to Taran *et al.* (2019), who recently showed that organizational risk willingness is central to BMI success, we contribute to this debate by providing the first empirical evidence on individual- and group-level risk-taking in BMI decisions.

Third, this work aims contribute to the body of literature on strategic group decision-making by examining the perceived behavior and interactions of leaders during BMI. Our study is the first attempt to empirically examine the importance of group biases in managers' BMI decision-making process. The article is also a response to Asemokha *et al.* (2021), who call for more qualitative studies to understand complex strategic decision-making processes. By examining the individual risk willingness of managers, this article also responds to Coffeng *et al.* (2021) who call for examining specific individual characteristics of managers and the impact of information sharing during their discussions.

The article is organized as follows. The first section reviews the relevant literature on BMI, decision-making, group biases and individual risk willingness, highlighting the need for research on BMI decision-making in groups. This is followed by a reconstruction of the methodology applied. The results of the 26 interviews that are the focus of this paper are then presented. The paper continues with a discussion of the findings and concludes with contributions to theory, important managerial implications, acknowledgment of limitations and recommendations for future research.

2. Theoretical background

2.1 Business model, business model innovation and decision-making

Business models (BMs) explain "how firms do business" (Zott *et al.*, 2011, p. 1021). BMs define how companies create, deliver and generate value (Granig and Hilgarter, 2020) by exploiting business opportunities (Amit and Zott, 2001). BMs are a potential source of competitive advantage (Casadesus-Masanell and Ricart, 2010; Teece, 2010) and subject of strategic (Zott

et al., 2011) and innovation management literature (Chesbrough, 2010). To fully understand the content of a BM, scholars suggest describing the individual elements in concrete terms. We used the nine BM elements of the BM Canvas defined by Osterwalder (2004): Value proposition, customer segments, key activities, key partners, key resources, customer relationships, channels, cost structure and revenue streams.

Due to dynamic changes in the environment, companies must constantly adapt their BM (Morris *et al.*, 2005; Kraus *et al.*, 2023; Snihur *et al.*, 2023) and their BM elements. This adaptation, modification, change and redesign of an existing BM are referred to as BMI (Lindgardt *et al.*, 2009). When internal and external opportunities or threats arise (Bucherer *et al.*, 2012; Kraus *et al.*, 2023), BMIs are an appropriate managerial approach to remain competitive (Geissdoerfer *et al.*, 2018). BMIs increase the resilience of an organization (Casadesus-Masanell and Ricart, 2011) by identifying new ways to create and generate value (Amit and Zott, 2001; Böttcher *et al.*, 2022; Teece, 2010). The implementation of BMI involves making strategic decisions. Although dynamic external changes require fast decision-making (Granig and Hilgarter, 2020), many companies fail to successfully implement BMI due to time-consuming decision-making (Doz and Kosonen, 2010). To solve this problem, recently, Snihur *et al.* (2023) developed a practical tool that helps executives determine whether and when they need to restructure their BM.

The BMI process has been described as an important construct and an intensely debated topic (Schneider and Spieth, 2013; Foss and Saebi, 2017). Several scholars have studied the complex organizational change process of BMI and described the process phases in different ways with similar characteristics (e.g. De Reuver *et al.*, 2013; Frankenberger *et al.*, 2013; Geissdoerfer *et al.*, 2017; Wirtz and Daiser, 2018). For this study, it is advisable to choose a simple BMI stage model as the basis for exploring group interaction during decision-making, since the focus of this study is on group interaction during collective BMI decision-making and not on the BMI process itself. We therefore decided to apply the 4I framework of Frankenberger *et al.* (2013), who divide the BMI process into four steps: Initiation, Ideation, Integration and Implementation. At the beginning, an internal or external change triggers the BMI process (Kraus *et al.*, 2023) and prompts the innovating company to understand and reevaluate the environment and stakeholders. Based on emergent internal or external opportunities and threats, the responsible organizational members must collect and generate ideas for the new or adapted BM in the second process phase (Frankenberger *et al.*, 2013). In the third phase of the process, a new and viable BM is developed based on the most promising idea from the former stage. In this third phase, the company is also asked to integrate the interests of other external stakeholders such as suppliers and partners. Finally, the fully conceptualized new BM is integrated internally and externally, which usually involves high investments and risks that may create internal or external resistance (Frankenberger *et al.*, 2013).

The design of new and the redesign of existing BMs is associated with uncertainty (Casadesus-Masanell and Ricart, 2010), ambiguity and risk (Schneckenberg *et al.*, 2017). The literature distinguishes between decisions under risk and decisions under uncertainty (Luan *et al.*, 2019). While all information is available for decisions under risk and the probability of all possible future states can be predicted, decisions under uncertainty imply imperfect knowledge and insufficient information. For decisions with great uncertainty, Gigerenzer and Brighton (2009) recommend the use of heuristics instead of complex management strategies, which are more appropriate in risky situations when past data can be used to develop multiple solutions. Some scholars suggest visionary approaches to planning processes that emphasize prediction (see Wiltbank *et al.*, 2006), while others advise adaptive approaches that focus on experimentation and learning (Sarasvathy, 2001) and are better suited for decision-making in uncertain environments (Alvarez and Barney, 2005). Björkdahl *et al.* (2022) add to this debate by applying a problem-based view to search for a viable BM. They distinguish

between backward- and forward-looking searches and concluded, based on three cases that when firms perceive potential failure to continue with their established way of doing business, they apply a forward-looking search. Conversely, executives shift to backward-looking search when they perceive high alternative costs. Hence, an organization's decision logic must adapt to dynamic changes in uncertain environments (Reymen *et al.*, 2017). However, the dynamic relationships between BM development and decision logic remain poorly understood (Andries *et al.*, 2013; Reymen *et al.*, 2017).

Board members can make flawed BM decisions due to limited individual expertise and cognitive shortcuts (Tversky and Kahneman, 1974; Wu *et al.*, 2018), so coping mechanisms are necessary to overcome the mental lack of insight and delayed action (Schneckenberg *et al.*, 2017). As strategic decisions are associated with various risks (Reymen *et al.*, 2017; Brillinger *et al.*, 2020), BMI decisions are usually made in groups with multiple decision-makers (Maciejovsky *et al.*, 2013) to increase the amount of information and mitigate individual cognitive biases. In the next section, we show how groups make decisions together and what advantages and disadvantages group decisions have compared to individual decisions.

2.2 Individual information processing, group decision-making and group biases

Leaders develop unique cognitive frameworks through which they process information on the basis of past experience and learning (Karhu and Ritala, 2020). For this, managers mentally frame information to make sense of information (Walsh, 1995). Interpretation of information is highly individual (Heubeck and Meckl, 2022). Individual mental models determine "how a given problem or decision is perceived" (Karhu and Ritala, 2020, p. 490). Kahneman (2012) and Walsh (1995) described two distinct ways to process information: the automatic processing mode and the controlled processing mode. In the automatic processing mode, people examine information at a superficial level, drawing on past experience in similar situations. Conversely, the current informational context shapes the controlled information processing mode. It is most applicable in new contexts for which decision-makers do not have prior knowledge patterns (Kahneman, 2012; Walsh, 1995). Heubeck and Meckl (2022) recently have shown that both managers' human capital (e.g. managerial knowledge, competencies and capabilities) and social capital (e.g. sympathy, trust, reciprocity) decisively shape how managers cognitively assess BMI alternatives. Managers with higher levels of human capital will be more aware of the opportunities and risks of BMI than those with lower levels of human capital. As a result, managers with higher levels of human capital are more likely to resort to the controlled mode of information processing than their counterparts with lower levels. In line with Alguezaui and Filieri (2010) and Manev *et al.* (2005), Heubeck and Meckl (2022) confirm that also social capital facilitates information sharing and decision quality. By enhancing trust, cooperation and collaboration across the firm, managerial social capital enables greater breadth and depth of information. This richness of information enables to assess BMI alternatives more consciously and to challenge existing mental models. Consequently, executives with higher social capital are more likely to operate in the controlled information processing mode (Heubeck and Meckl, 2022).

While these findings contribute to understanding how information is processed and interpreted at the individual level, we need to understand how these individuals synthesize their information at the collective level (Heubeck and Meckl, 2022) in decision-making processes. Group decision-making is advantageous because the expertise of an individual is limited whereas the collective expertise of the group is beneficial (Wu *et al.*, 2020). The quality of individual decision-making decreases when individuals misjudge a situation or their abilities, when they are overwhelmed, or when they do not consider enough information and alternatives (Jones and Roelofsma, 2000; Bang and Frith, 2017). Due to the described subjective managerial cognition, the knowledge and skills of all decision-makers are required

to select the best option. Groups have a higher cognitive capacity because of more experience and access to more alternative solutions offered by the management team. Groups learn faster and adapt better to the organizational strategy than individuals (Maciejovsky *et al.*, 2013). Some studies show that groups can analyze complex problems more accurately due to the diverse experiences and information (Minson *et al.*, 2011; Klein and Epley, 2015) as group members discuss and interact.

However, there is also evidence in the decision-making literature that groupthink can lead to a premature search for agreement due to stress and anxiety, resulting in poor information search, synthesis and evaluation (Chapman, 2006). In addition, groups have limited expertise, experience and individual skills (Wu *et al.*, 2018), so even when using the recommended discussion procedures (Brodbeck *et al.*, 2007; Lu *et al.*, 2012), incorrect decisions may be made (Bang and Frith, 2017). Many times, individuals have an initial preference before the group decision is made that represents their preferred decision alternative based on their own experience or information (Stasser and Titus, 2003). Individuals often stick to this initial preference and seek information to confirm it, although there are gender differences (Nicholson *et al.*, 2022). Brodbeck *et al.* (2007) confirmed this confirmation bias at the group level, with most group members preferring the initial majority preference. Based on groupthink theory (Janis, 1982), groups strive for consensus while inadequately sharing and evaluating information, leading to false overconfidence (Coffeng *et al.*, 2021). Due to the challenges of collective decision-making, common group biases that are detrimental to good decision-making have been identified in the literature. In this study, the effects of group interaction in strategic group decisions are examined as summarized in Table 1. In conclusion, there is a need to identify which of these pitfalls may occur in groups specifically in the strategic BMI context so that boards can more effectively exploit business opportunities.

2.3 Individual risk willingness and decision-making in the BMI context

Risk-taking is an essential prerequisite for entrepreneurial orientation (Asemokha *et al.*, 2021). Sitkin and Pablo (1992) identified several individual characteristics that predict risk-taking in decision-making such as individual risk willingness or interaction with other group members. Since risk perception and risk behavior are subjective, individuals evaluate the same situation differently (March and Shapira, 1987). Various risk behaviors result from different risk perceptions, individual characteristics, decision contexts and domains (Ferrey and Mishra, 2014). Situational differences arise from different decision domains (Figner and Weber, 2011; Weber *et al.*, 2002). Two opposing philosophies of risk behavior dominate the literature. In the prospect theory proposed by Kahneman and Tversky (1979), managers engage in risk-taking behavior when confronted with a potential loss during decision-making. In contrast, Staw *et al.* (1981) predicted risk-averse reactions based on their threat rigidity theory.

Individuals differ not only in their risk perception and risk behavior, but also in their willingness to take risks (Arslan *et al.*, 2020). A person's risk appetite can range from risk-averse to risk-neutral to risk-willing. Regarding decision-making in groups, researchers disagree on whether groups are more risk averse than individuals (e.g. Baker *et al.*, 2008) or vice versa (e.g. Zhang and Casari, 2012).

In the context of BMI, little is known about the role of risk aversion. Few articles have dealt with this aspect. However, risk willingness has a decisive influence on whether a group decides to modify an existing business opportunity or to explore new ones. Tykkyläinen and Ritala (2021) consider risk aversion as an important boundary for BMI in social enterprises. Chesbrough (2010) and Laukkanen and Patala (2014) emphasized that risk aversion is one of the main barriers to successful BMI. Therefore, emerging business opportunities may be

Group bias	Definition	Causes and symptoms	Author(s)
Groupthink	A mindset that group members display when they prefer harmony to dissent	There are two main reasons for groupthink: either group members are too similar or they are too close. While group members strive for unity, they ignore the limits of the decision they have made, overestimate their chances of success, or do not consider alternatives	Cristofaro (2016), Jones and Roelofsma (2000), Mintz and Wayne (2016)
Social influence	A phenomenon in which individuals are influenced by the people with whom they interact and change their behavior or attitude	The effect is based on the herding theory as the tendency of individuals to imitate the actions of others. Three different types influence the behavior of group members: (1) Conformity is an individual's desire to belong to a group and occurs when individuals feel pressure to behave in a way that allows them to be rewarded or escape punishment. (2) Identification occurs when individuals adopt the behavior of a respected or successful group, ignoring their own instincts. This assumption also explains (3) internalization, which expresses the (un) conscious decision to adopt the behavior or opinions of others	Barsade (2002), Wang *et al.* (2013)
Hidden profile paradigm	The tendency of a group to focus on information that is shared by all group members	Groups reduce the amount of information instead of considering the totality of information of all group members. Necessary information remains "hidden" and is not known to all group members, although information should be shared to increase mutual knowledge and thus find the best alternative solution	Kerr and Tindale (2004), Lam and Schaubroeck (2011), Schulz-Hardt *et al.* (2006)
Group polarization	The phenomenon that occurs when original positions or preferences in a group mutually reinforce each other	In group discussions, individuals base their opinions on the arguments of others. People tend to confirm the opinion of the majority and avoid expressing counterarguments in order to escape social risks. Uncertainty about one's own preferences leads one to seek the arguments of others. If the majority is favorable to risk, the group decision may be riskier (risky shift) than if each group member had decided individually and vice versa (cautious shift)	Jones and Roelofsma (2000), Wang *et al.* (2018)
Competing goals	The bias when an individual is more concerned with his own motives than with making a good decision for the group	Causes for this effect may be that individuals do not voice their concerns so as not to jeopardize their reputation or status within the group or because they expect to have to justify their arguments. Competing goals can lead to going along with the majority opinion, regardless of one's own preference and wasting valuable resources and information	Tetlock *et al.* (1989), Bang and Frith (2017)

(*continued*)

Table 1.
Major strategic group biases, based on the summary of Bang and Frith (2017)

Group bias	Definition	Causes and symptoms	Author(s)
Social loafing	A motivational construct in which a person exerts less effort when working in a group than when working alone	Dissatisfaction with management and one's job can promote social loafing. Lack of measurability of individual results, lack of opportunities to evaluate results and lack of uniqueness of individual results reduce the effort individuals put into working in groups. Individuals are more likely to reduce effort when they know that others are limiting their contribution to success, which is why they are not doing their best	Meyer *et al.* (2016), Mihelič and Culiberg (2019)
False consensus	The tendency of a person to overestimate his or her similarity to others	False consensus occurs when group members overestimate the likelihood that others will act in the same way and have the same opinion, view and preference, and therefore, they are part of the majority. This leads to the assumption that everyone chooses the same information bases, resulting in biased decisions	Jones and Roelofsma (2000), Ross *et al.* (1977), Roth and Voskort (2014)
Escalating commitment	The tendency of an individual to invest resources even though there is evidence that the action will fail	This effect is caused by psychological, organizational, cultural and economic factors. Individuals may stick to their decisions despite signs of failure: personal responsibility, self-protection or refusal to admit mistakes, the belief that the situation will improve despite negative feedback, or the urge to preserve one's reputation	Jones and Roelofsma (2000), Huang *et al.* (2019), Montecinos-Pearce *et al.* (2020)

Table 1.

forfeited due to an insufficient willingness to face the emerging risks. In contrast, Leppäaho and Ritala (2022) find that risk-averse family firms, triggered by crises, may temporarily exhibit risk-taking innovation behavior. However, we still do not know the details of how individual and group risk-taking behavior changes when managers interact. This study aims to shed light on this blind spot by examining individual risk willingness and collective risk-taking and their impact on strategic BMI decision-making through manager interaction.

2.4 Synthesis of the research areas

Since this study aims to link several different fields of research, it is necessary to synthesize multiple viewpoints then create a theoretical model. Our conceptual model is presented in Figure 1. To link the different research areas, we proceed from top to bottom:

The BMI process is triggered by an internal or external opportunity or threat (Kraus *et al.*, 2023) that initiates the adaptation, redesign, modification or change of an existing BM (top left, 1st level of analysis; Lindgardt *et al.*, 2009). As part of the BMI process, all nine elements of a BM (Osterwalder, 2004) must be determined (2nd level of analysis). At the beginning of the BMI process, the board decides in principle whether it intends to renew the existing BM. The board members interact and discuss what value the organization wants to create with the new BM (3rd level of analysis). In this process, the executive team can contribute (e.g. more information and experience) but also suffer from potentially inhibiting interaction of its members (e.g. group biases and poor information search). A particular focus of our study is individual risk willingness (bottom center, 4th level of analysis). Since BMI decisions have a strong strategic impact, they are typically not made by a single person but by the entire board. Board members differ in their level of individual risk willingness (risk-willing, risk-

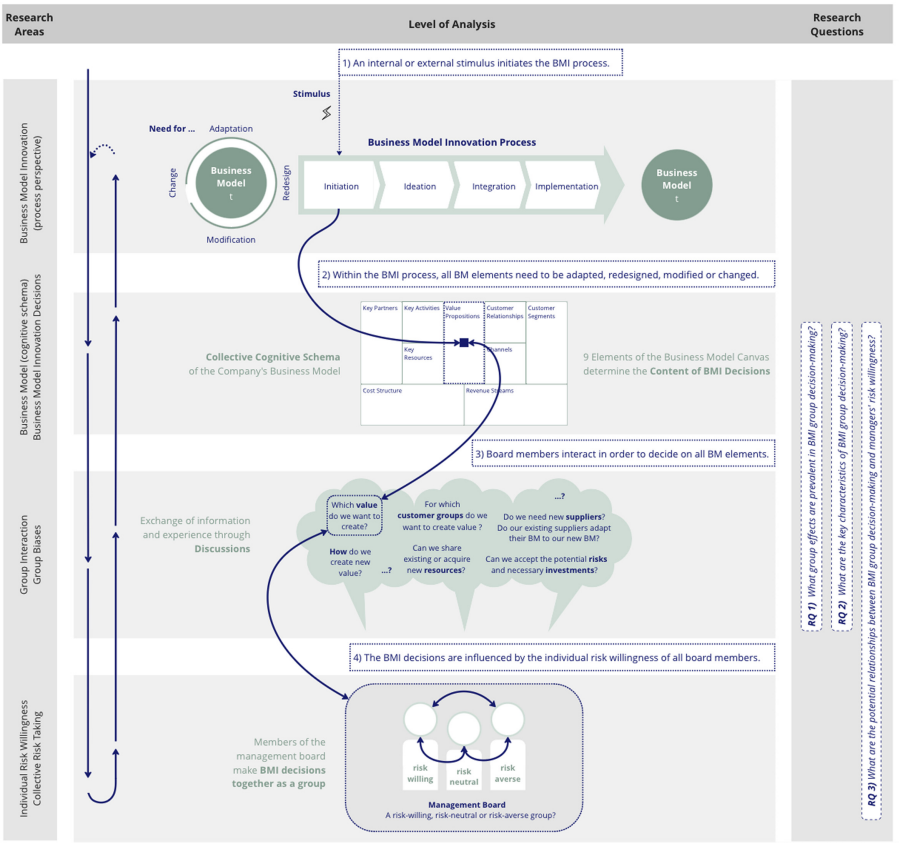

Figure 1.
Conceptual model

neutral, or risk-averse board members). As the board members interact, the management group is characterized by its own group risk willingness. The question is therefore whether the board is more or less risky due to internal social interaction and whether the board makes more or less risky BMI decisions than an individual board member? We expect the riskiness of the group to affect the redesign and final content of the nine BM elements. For example, we expect a risk-willing board to be more likely to seek out new customer groups than a risk-averse board. From a financial perspective, we expect a risk-averse board to be more conservative and cautious with its revenue streams than a risk-willing board would be. The distinction between the nine BM elements provides a more detailed schema of questions that need to be answered in collective BMI decision-making.

Bringing together the different areas of research, we can derive three research questions for this study:

RQ1. What group effects are prevalent in BMI group decision-making?

RQ2. What are the key characteristics of BMI group decisions?

RQ3. What are the potential relationships between BMI group decision-making and managers' risk willingness?

3. Research design

To date, there is limited theory that explains the relationships between BMI decisions, group interaction and risk taking. By conducting 26 semi-structured interviews with German managing directors, we qualitatively add to the body of knowledge. This study is the first of its kind to explore the integration of BM, BMI decision-making, group interaction and group biases and risk willingness. The study aims to provide new insights into the complex relationship between these research fields, which is why a qualitative, exploratory research design was chosen. Our methodological approach is in line with Nutt's (2011) recommendation to use qualitative research methods to understand complex decision-making processes and was also applied by Altinay *et al.* (2014) to investigate the extensive relationships between culture, trust and customer relationships. We developed open-ended questions to analyze the impact of group biases and the influence of individual and group risk willingness on strategic BMI decisions. This study examines managers' perceptions of group interaction, not the group interaction itself, which is why a qualitative approach is also preferable to other experimental designs.

3.1 Recruiting and sample

First, three interviewers received information about the research topic, objective and research questions, as well as training on the process of qualitative interviews. Second, the interviewers reviewed the websites and media reports of the German Commercial Register and the German Engineering Federation to identify potential interviewees from companies that had changed their BM. An explanatory document about the research project was attached to an initial e-mail sent to potential interviewees to solicit participation and gain the necessary background information from the interviewees. The first contact was followed up with a second contact to potential interviewees who agreed to participate. The crucial requirement for the interviewees was their leading position in the company (managing director, top manager, department, or team leader). Since the aim of the study is to analyze group biases in the mutual BMI decision process, at least two executives of a company's decision-making body had to be interviewed. This process yielded a sample of 26 interviewees from thirteen companies.

Regardless of industry and firm size, BMI may be relevant to all firms when internal causes and environmental changes require adaptation or reconfiguration of the existing BM. Therefore, the sample includes firms from different industries and firm sizes to bring together different perspectives on this topic. The sample includes six small (SM), five medium (ME), two large (LA) and one micro firm (MI). The majority (ten) of the thirteen companies belong to the manufacturing sector. The other companies are from the mobility, health and energy sectors. The sample includes two female and 24 male respondents, all of whom hold senior positions with an average age of 44.9 years. The sample is appropriate because all participants are directly involved in making strategic BMI decisions at their company, including decisions about developing and marketing of existing and new products and services, adjusting revenue streams, costs, resources and the company's value architecture. The acquisition of interview partners and data collection were discontinued once theoretical saturation had been reached. In particular, the coding of interview numbers 25 and 26 did not yield any new categories. Table 2 shows all sociodemographic information about the interviewees.

3.2 Data collection

This exploratory study includes data from (1**) sociodemographic questionnaires** and **(2) semi-structured interviews** with 26 participants in German, collected between December 2020 and April 2021. The sociodemographic questionnaire was sent to the participants before the interviews were conducted. The questionnaire requested data on the company (industry, number of employees, number of hierarchical levels), individual characteristics (e.g. age, gender, education, position in the company) and self-assessed individual risk willingness. Since both the context and the characteristics of the decision-maker influence individual risk willingness (Blais

Company ID	Sector	Company size	Interview ID	Position	Gender	Age*	Interview duration
C1	Manufacturing Sector	ME	Int_1.1	Executive Director	M	38	38:45
			Int_1.2	Head of Sales, Executive Director	M	63	29:48
C2	Manufacturing Sector	ME	Int_2.1	CTO, Managing Director	M	30	46:20
			Int_2.2	CPO	M	29	33:31
C3	Manufacturing Sector	SM	Int_3.1	Founder, CFO	M	39	22:09
			Int_3.2	Executive Partner	M	33	22:57
C4	Manufacturing Sector	SM	Int_4.1	Managing Director	M	50	20:33
			Int_4.2	Owner, Managing Director	F	49	29:22
C5	Mobility Sector	MI	Int_5.1	Managing Director	M	28	22:12
			Int_5.2	CPO, Founder	M	28	21:02
C6	Energy Sector	LA	Int_6.1	Department Manager	M	55	41:28
			Int_6.2	Department Manager	M	57	37:32
C7	Health Sector	LA	Int_7.1	Top Manager	M	34	33:53
			Int_7.2	Management Consultant	M	31	58:59
C8	Manufacturing Sector	SM	Int_8.1	Managing Director	M	54	21:08
			Int_8.2	CRO	M	45	24:45
C9	Manufacturing Sector	SM	Int_9.1	Managing Director	M	35	24:17
			Int_9.2	Managing Director	M	64	29:53
C10	Manufacturing Sector	SM	Int_10.1	Managing Director	M	51	34:55
			Int_10.2	Managing Director	M	41	32:37
C11	Manufacturing Sector	ME	Int_11.1	Customer Operations Manager	M	54	23:19
			Int_11.2	Technology Manager	M	51	27:13
C12	Manufacturing Sector	ME	Int_12.1	CRO	M	54	30:41
			Int_12.2	Managing Director, COO	M	56	28:43
C13	Manufacturing Sector	ME	Int_13.1	CRO	M	51	17:15
			Int_13.2	Managing Director	F	59	16:51

Note(s): * as of interview year; MI . . . micro firm <10 employees, SM . . . small firm <50 employees, ME . . . medium-size firm <250 employees, LA . . . large firm >250 employees; M . . . male, F . . . female

Table 2. Company-specific and demographic details of the respondents

and Weber, 2006), situational differences were considered in the questionnaire (general, financial and professional risk willingness). Importantly, individual risk willingness must be part of the written questionnaire to avoid external influences by the interviewer.

Subsequently, 26 semi-structured interviews were conducted with an average interview duration of 30 min. The open-ended interview questions were developed after several discussions by a team of two researchers based on established literature. Questioning consisted of two parts. Part A explored board members' strategic BMI decision-making behavior (e.g. describing the typical strategic BMI decision-making process). Part B explored interviewees' perceptions of group interaction and emerging group bias (e.g. individual decision-making behavior vs collective decision-making behavior, influence of other decision-makers, desire for unity). The questions in Part A build on the existing BMI literature, in particular the BM canvas by Osterwalder (2004) and the BMI process description by Frankenberger *et al.* (2013). Part B draws from the literature on group decision-making and group bias. To examine the advantages of group decision-making, we drew on existing evidence from the studies of Jones and Roelofsma (2000), Klein and Epley (2015), Maciejovsky *et al.* (2013), Minson *et al.* (2011)

and Wu *et al.* (2020), for the disadvantages of group decision-making, we relied on established work by Brodbeck *et al.* (2007), Chapman (2006), Coffeng *et al.* (2021), Lu *et al.* (2012), Stasser and Titus (2003) and Wu *et al.* (2018). The questions on group bias were based on Bang and Frith's (2017) summary of key strategic group biases, particularly the literature that has identified causes and symptoms (e.g. Huang *et al.*, 2019; Jones and Roelofsma, 2000; Montecinos-Pearce *et al.*, 2020; see Table 1 for the full list of authors). Finally, the interview guide was revised and adapted in an iterative process to ensure consistency and comprehensibility.

3.3 Description of the managers' risk willingness

Participants were asked to self-assess how risk-willing they are in different contexts on a 7-point Likert scale (see Table 3), based on the established Socio-Economic Panel questionnaire (SOEP-IS Group, 2019). Response categories "1," "2," and "3" reflect a risk-averse person, "4" a risk-neutral person and "5," "6," and "7" a risk-willing person. Such a self-report scale is suitable for assessing individual risk tolerance (Dohmen *et al.*, 2011). Most participants indicated their individual risk willingness differently depending on the three contexts (general, financial and professional risk willingness). Only seven respondents (Int_1.1, Int_2.1, Int_3.1, Int_3.2, Int_4.2, Int_5.1 and Int_6.1) estimate that their risk willingness does not change depending on the context. On average, the sample is slightly risk averse in general (4.61) and in the professional context (4.65); in the financial

Table 3. Self-assessed individual risk willingness, perceived risk willingness of the colleague and the management board in total

Company ID	Interview ID	Risk willingness			Perceived risk willingness of colleague	Perceived board's risk willingness
		General	Financial	Professional		
C1	Int_1.1	RN *(4)*	RN *(4)*	RN *(4)*	RN	RN
	Int_1.2	RW *(5)*	RN *(4)*	RN *(4)*	RA	RN
C2	Int_2.1	RW *(6)*	RW *(6)*	RW *(6)*	RA	RW
	Int_2.2	RW *(6)*	RW *(5)*	RW *(6)*	RW	RN
C3	Int_3.1	RA *(3)*	RA *(3)*	RA *(3)*	RA	RN
	Int_3.2	RW *(5)*	RW *(5)*	RW *(5)*	RW	RW
C4	Int_4.1	RN *(4)*	RA *(3)*	RA *(3)*	RA	RN
	Int_4.2	RA *(2)*	RA *(2)*	RA *(2)*	RN	RA
C5	Int_5.1	RW *(6)*	RW *(6)*	RW *(6)*	RW	RW
	Int_5.2	RW *(7)*	RW *(7)*	RW *(6)*	RW	RW
C6	Int_6.1	RW *(5)*	RW *(5)*	RW *(5)*	RN	RA
	Int_6.2	n.d	n.d	n.d	RA	RW
C7	Int_7.1	RW *(6)*	RW *(5)*	RW *(6)*	RW	RW
	Int_7.2	RW *(5)*	RA *(2)*	RW *(6)*	RW	RW
C8	Int_8.1	RN *(4)*	RA *(3)*	RA *(3)*	RA	RA
	Int_8.2	RN *(4)*	RA *(2)*	RA *(3)*	RA	RN
C9	Int_9.1	RN *(4)*	RA *(3)*	RN *(4)*	RN	RN
	Int_9.2	RW *(5)*	RN *(4)*	RW *(6)*	RN	RN
C10	Int_10.1	RA *(3)*	RA *(2)*	RN *(4)*	RA	RA
	Int_10.2	RN *(4)*	RW *(5)*	RA *(3)*	RW	RW
C11	Int_11.1	RW *(5)*	RN *(4)*	RW *(5)*	RA	RN
	Int_11.2	RW *(5)*	RN *(4)*	RW *(6)*	RA	RA
C12	Int_12.1	n.d	n.d	n.d	RA	RN
	Int_12.2	RW *(5)*	RN *(4)*	RW *(5)*	RW	RW
C13	Int_13.1	RN *(4)*	RW *(5)*	RW *(5)*	RN	RN
	Int_13.2	RN *(4)*	RA *(3)*	RN *(4)*	RW	RN
Average		RW *(4,61)*	RN *(3,96)*	RW *(4,65)*		

Note(s): RW . . . risk-willing, RN . . . risk-neutral, RA . . . risk averse, n.d. . . not determined

context, the managers surveyed are risk-neutral (3.96). Spearman Rho confirms a highly significant positive correlation between general and professional individual risk willingness (0.897) therefore we used the average of the two values for further analysis. The data show that in only nine of the 26 responses did the self-reported risk willingness (general context) match the perceived risk willingness of the colleague. For example, Int_2.1 and Int_2.2 agreed that Int_2.2 was risk-willing. This independent agreement was also evident between Int_4.1 and Int_4.2 and vice versa, Int_5.1 and Int_5.2 and vice versa, Int_7.1 and Int_7.2 and vice versa, between Int_9.1 and Int_9.2 and between Int_13.2 and Int_13.1. The majority (15 respondents) rated their risk willingness (general context) the same as the perceived risk willingness of the entire board.

3.4 Data analysis

This study was a thematic analysis following Gioia's guidelines (see Figure 2). The iterative approach allows for the identification of themes and connections between research domains at the organizational and individual level based on empirical data (Braun and Clarke, 2006; Gioia *et al.*, 2013). After transcribing all 26 interviews verbatim, the data was analyzed in three steps. First, two researchers independently open-coded the data using MAXQDA 2022 software, resulting in two coding schemes. Then the two coding schemes were merged and analyzed for existing and missing coding overlaps. Second, all codes from the merged coding scheme were extracted, printed out, then analyzed to identify which codes matched thematically and structured. We then categorized related codes into more abstract themes and iteratively refined the themes by reevaluating the data. The iterative process resulting in the emergence of eight main categories. Validity was maintained by comparing the categories with the existing literature. Third, we assessed the relationships between these eight main categories resulting in the emergence of four overarching themes. We compared the overarching themes again with the data to verify that they were appropriate and to check whether

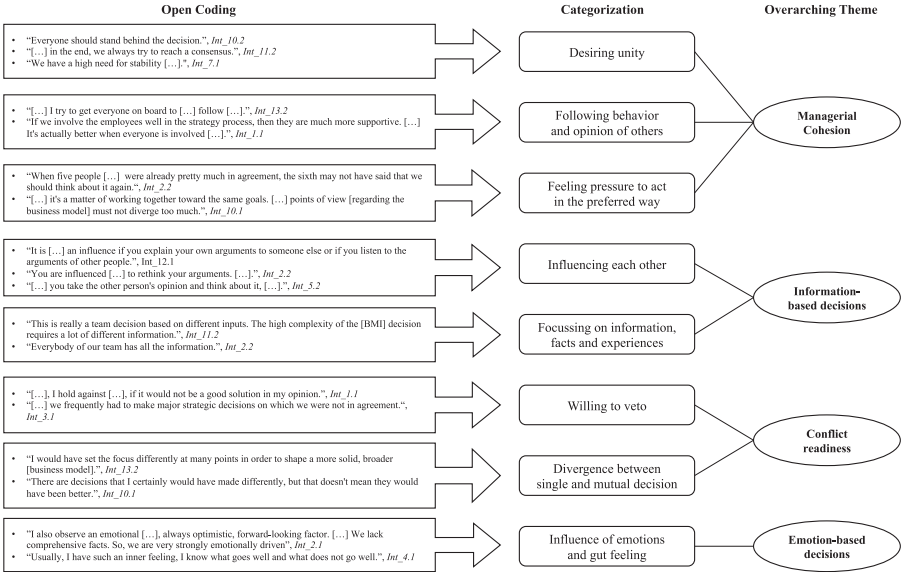

Figure 2.
Thematic analysis

further categories were needed. Figure 2 shows sample quotes from the open coding process, the eight main categories and the four final overarching themes.

4. Findings

We begin by explaining which group effects are prevalent in BMI group decision-making (RQ1, section 4.1). We then describe our BMI decision matrix which we use to determine the key characteristics of BMI group decisions (RQ2, section 4.2). The last section explains the identified relationships between BMI group decisions and the risk willingness of managers (RQ3, section 4.3). This is done by mapping risk willingness as an individual characteristic in the proposed BMI decision matrix.

4.1 Managers' group interaction in BMI decisions

To examine which group effects prevail in BMI group decision-making, we compared the developed categories with literature on symptoms and causes of group biases. The results show that BMI group decisions of managing directors are mainly influenced by the symptoms of the following four group biases:

4.1.1 Groupthink. Interviewee 10.1 saw joint discussions about BMI as the real "purpose" of standing together behind a decision once it was made. Like most interviewees, 6.1 reported that on his team, "it's important to build consensus before making a strategic decision." For 5.1, trust in other group members plays a key role. However, interviewee 7.2 also criticized that "if everyone says from the start, yes, we'll do it, then of course we'll do it," so reflections are prevented and "confrontations [are] avoided" (9.1). According to 4.2, groupthink also stems from a sense of responsibility to various stakeholders: "It should be for the community, for the family, for the company [. . .] We also do the things we do here publicly, and there it is of course also important that people agree."

4.1.2 Social influence. Interviewees perceived that they influenced each other in decision-making. Interviewee 12.1 saw mutual influence as part of forming opinions in the board: "Every decision that is to be brought about is always a struggle, also for interpretation." Therefore, explaining your arguments to someone and listening to the arguments of others is influencing. Interviewee 9.1 perceived the mutual influence as "positive in the sense of being consultative," while 3.1 appreciates that his colleague 3.2 "[. . .] has a completely different perspective on things, which helps [him] to leave [his] own bubble and take a different perspective." In company 7, external consultants enrich the decision-making process in adapting the existing BM, where they "unlike internal consultants enjoy a very high level of trust." Interviewees 5.1 and 5.2 had the experience that they could also make a wrong decision due to mutual influence: "You are proud of what you have achieved so far, and I think you are then also a bit naïve, and that fell on our feet there." Interviewee 2.2 recalled a situation in which he should have voiced his concerns but did not because of the group structure: "Because [. . .] five people were already pretty much in agreement; the sixth person did not say let us think about it again. A strong momentum developed". His colleague 2.1 describes the reason for the decision against his gut feeling: "Why did I participate? That's the subject of your work. And why? I think for lack of good counterarguments".

Several interviewees would have chosen otherwise, but bowed within the group. Interviewee 11.1 saw the reason for this in the fact that the corporate culture requires consensus. In companies 12 and 13, interviewees rated their legal form as a constraint in adapting the BM. Interviewee 12.2 stated, "[. . .] we have to subordinate ourselves to [the corporate group] [. . .] [I] could have imagined that we would have pushed some developments more and entered other market segments [. . .]. But here I am bound by the decisions of the corporate group." Interviewee 13.2 estimated that she would have opted for a

"more solid, broader development in the long term" for the company. Nevertheless, the owner has increasingly asserted its interests in recent years.

4.1.3 Hidden profile. Most respondents indicated that they made their BMI decisions based mainly on available information. Transparency played an important role, as also assessed by interviewee 2.2: "[. . .] everybody always has all the knowledge, and that is also the goal of a discussion. [. . .] [You can] only make good decisions [. . .] if you also have a good level of knowledge." At the same time, interviewee 7.2 posed the question, "What is certain knowledge, what is unknown knowledge, and what is unknown non-knowledge?" Interviewee 8.2 stated that the employees who prepare the information influence the decision by selecting the first information. Interviewee 6.2 disagrees, saying, "Of course [everyone] has a consistent level of information." Interviewee 13.1 assumed that the existing level of information in the team is increased by joint discussions, "because first there is a professional discussion and if it is technically comprehensible, of course you also take into account what your colleagues say."

4.1.4 Group polarization. In company 5, resistance to BMI decision-making is low when the arguments in the prepared documents are clear (5.2). Interviewee 2.1 commented that before upcoming decisions he sums up as follows, "[. . .] and then these are the three, four arguments" with which he first enters the discussion so that he makes his pre-selection of information before the joint meeting. He added: "Only if you can convince each other [through arguments], not if someone makes the decision based on his position, [. . .] then it's a good decision."

In addition to comprehensible arguments, the existing experience in the team also forms an essential basis for decision-making in the view of the interviewees. Interviewee 10.1 appreciates bringing his own experience into the decision-making process: "Of course, it may be that there are individual team members who do not know this view of the customers. I [. . .] take the opportunity to give them the customers' perspective." Interviewee 3.1 also found negative experiences useful for BMI decision-making: "[. . .] Look, if we do not do this and that now in the next few months, we'll just have to lay people off."

The four other group biases in strategic decision-making processes known from the literature – conflicting goals, social loafing, false consensus and escalating commitment – were not strongly perceived by the interviewees.

4.2 Development of a BMI decision matrix

The BMI decision matrix, which defines the key characteristics of BMI group decision-making emerged from the interviews. Eight categories were identified that merge into the four overarching themes (see Figure 3). Of the four overarching themes, two form an inductively derived axis: Axis 1 (y-axis) spans the range for group interaction between managers in BMI decision-making (overarching themes: managerial cohesion and conflict readiness). Axis 2 x-axis) represents the range decision bases of BMI decisions (overarching themes: information-based and emotion-based decisions). Based on these two axes, a BMI decision matrix emerged that encompasses the key characteristics of board members' BMI decisions. Figure 3 shows how BMI decisions can be grouped in the matrix. The numbers indicate how many of the 26 managers interviewed displayed signs of each overarching theme.

4.2.1 Axis 1 (y-axis): group interaction. Board members' group interactions were characterized by perceived managerial cohesion and managers' individual readiness to engage in conflict. Participants perceived a board's managerial cohesion as a positive condition for their daily business (+), because "there is [. . .] a great need for stability and togetherness, [. . .] that is an important asset, because in the complex world we still need a common understanding of what we really want in the future." (Int_7.1). The overall corporate

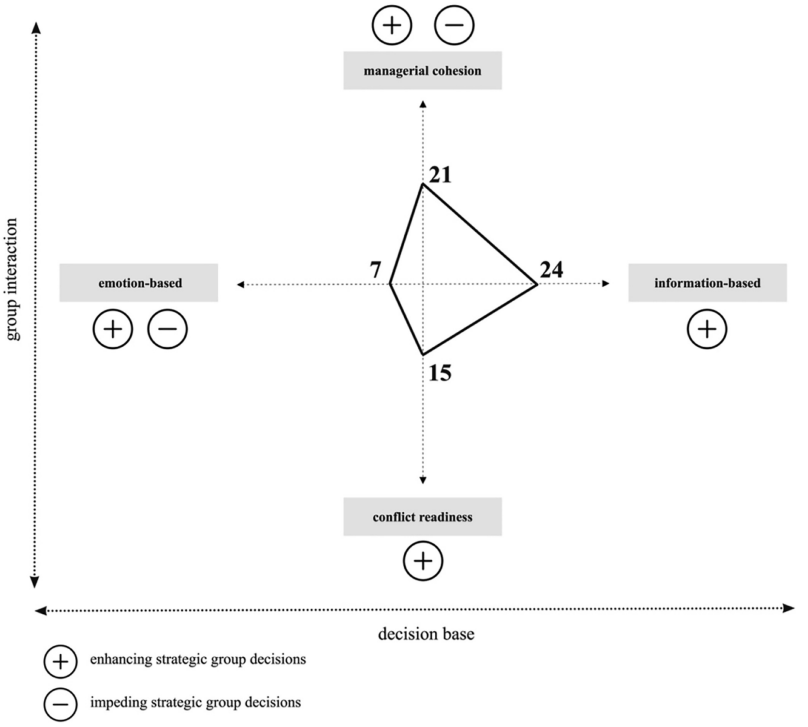

Figure 3.
BMI decision matrix (illustration of interview responses in total number of respondents)

goal seems to be the development of consensus (e.g. Int_6.1, Int_11.1, Int_12.1 and Int_12.2), because the participants report that only when everyone decides together, the team stands together behind a decision (Int_4.1, Int_10.1 and Int_10.2). This is necessary to keep employees motivated: "[. . .] because experience shows [. . .]: if you do not stand behind what you do, you only do it with half motivation." (Int_13.2). Interviewees 8.2 and 6.2 agree that "there must be a group effect in the company" (Int_8.2), because according to the company culture everyone should think similarly (Int_6.2). Most managers indeed consciously perceive that they adopt the opinion of others. In case of very specific individual knowledge, other decision-makers have to rely on this opinion (Int_3.2). This seems to be especially important in case of failure, because it must be "[. . .] clear to all employees what we expected from [. . .] [this decision] [. . .] and why progress may not have occurred [. . .] as we expected." (Int_10.1). Respondents wanted to feel that they were part of the management team. Accordingly, Int_2.1 occasionally felt pressured to help others and wanted to be collegial, which changed his own decision-making behavior. Although, in retrospect, it had already proven to be the wrong decision.

In comparison, respondents were aware that conflict was necessary for prosperous business development. They did not see conflict as a matter of private disagreement, but as helpful (+) to "sharpen one's own arguments" (Int_2.2) and to compare different perspectives (Int_7.1). However, the wording differed: some respondents described "confrontation" as less problematic (e.g. Int_8.1 and Int_13.1) than others who preferred to talk about "discussions" (Int_9.2). Respondents considered mutual discussions crucial to overcome information asymmetries. In doing so, certain alternative solutions may meet resistance from others (e.g.

Int_1.2, Int_3.2, Int_8.1 and Int_13.1), although "a cozy course will not get us anywhere [. . .] But that's not a bad thing." (Int_9.2). When it comes to critical aspects, respondents report that is inevitable to come into conflict (Int_1.1) and to debate intensively in order to ensure the survival of the company: "[. . .] he knows how to deal with it and that I am not trying to criticize him or anything, I am trying to find a solution to the problem." (Int_3.1).

4.2.2 Axis 2 (x-axis): decision base. The results show that board members believe that they make decisions mainly based on of information and arguments, although they are aware that emotions and gut feelings also influence decision-making behavior. However, emotions and gut feelings seem to play a subordinate role in BMI decision-making. Although the managing directors influence each other in the decision-making process, they firmly believe that their decisions are mainly based on information. The interviewees see the joint discussion as a beneficial opportunity for information exchange and reflection (Int_1.1, Int_4.2), through which they are also willing to change their minds. Challenging each other's arguments seems appropriate (Int_1.2), since the process leads to a favorable outcome for the company. Some managers (e.g. Int_2.1, Int_4.1) support the options of others when they have no good counterarguments. Although managers know that they need their internal (Int_10.2) and external experts (Int_9.1) to get details, they are only partially aware that important information may be filtered by employees in advance (Int_8.2, Int_12.1). The employees' information selection influences the starting point for a BMI decision and consequently the initial majority preference of the decision group.

Interaction within the group is essential to increase mutual knowledge. The results show that respondents focused mainly on the information available to all decision-makers and less on individual knowledge. Mutual influence is predominantly perceived positively (e.g. Int_1.1, Int_3.1), although none of the interviewees were directly aware of the possible existence of group confirmation bias. As discussions seem to bring all the arguments together (Int_10.2), participants believe that constructive dialog helps them to get all the information (Int_2.2, Int_6.2). As a result, respondents were willing to agree on a particular decision option if they could understand each other's thoughts and arguments. Once a common information base was established, team members usually agreed quickly, which also indicates the presence of the preferred choice of initial majority preference that we know from the literature (Brodbeck *et al.*, 2007).

Seven respondents directly indicated that they also make their BMI decisions based on emotion, although they pretend that gut feelings are less relevant for them in their decisions. Respondent 1.1 strongly associated gut feelings with his own experiences, while for his colleague gut feelings can be a warning signal in the decision-making process. In this case, discussions can help overcome doubts by providing clarity to the team. In contrast, too much positive sentiment can lead to ignoring important facts, as interviewee 2.1 experienced, "We carried the momentum, but [. . .] over the next few weeks we became uncertain, [. . .] then everyone wondered, did we actually pay attention to this? [. . .] Two weeks later someone was really thinking about the numbers, we actually still had to do that, which you do not realize until you are out of that emotional rut. [. . .] that has some effect on me and my people. Then, at some point I realized, wow, this totally sucks, I should have asked better." In addition, some interviewees observed an interplay between emotional and informational exchanges when making BMI decisions. Managers go into a decision with an initial individual gut feeling, which they try to confirm with their own and others' arguments (Int_2.2). In this sense, trust with colleagues plays a crucial role for interviewee 3.1 due to strong, long-standing relationships: "There is a very deep level of trust. It's more about making the decision-making process transparent to the other person so that they know why I did it the way I did and maybe question it critically again."

4.3 Relating individual risk willingness, group interaction and BMI decision base

We now answer the last research question by explaining how managers' individual risk willingness and BMI decision-making are related. We mapped the individual risk willingness in our proposed BMI decision matrix as shown in Figure 4.

Contrary to expectations, the interviews did not indicate that social interaction changes the decision-makers' risk willingness in the decision-making process. The interviews revealed that risk-willing decision-makers were not able to persuade other members of the decision team to make riskier decisions. Therefore, we cannot confirm that boards make riskier decisions than individuals (risky shift) and vice versa (cautious shift), as reported by Zhang and Casari (2012). Rather, our results show that additional information available to risk-averse decision-makers reduces the perceived uncertainty. Thus, if risk-averse decision-makers have gathered enough information, they may be willing to pursue a riskier option. Therefore, risky decisions appear to be more a function of the quantity and quality of available information rather than individual risk willingness.

The results also show that risk-averse, risk-neutral and risk-willing managers do indeed exhibit different decision-making behavior, even if the three risk willingness types hardly differ in terms of the basis of their decisions. Table 4 and Figure 4 illustrate that risk-willing managers have the highest desire for managerial cohesion and risk-averse managers the lowest. The results on willingness to engage in conflict show the greatest differences with risk-averse managers usually more willing to accepting conflict. Risk-averse managers reported that they question arguments intensively and then give their board the opportunity to refine solutions. Risk-averse managers perceive the need for managerial cohesion to be lower because their priority is a solid overall result for the company. They therefore seem to play an important role in the long-term internal acceptance of BMI's decisions. Only if every team member understands the importance and background of a decision will everyone stay motivated and implement the BMI decision with vigor. The risk-neutral managers with the least willingness to engage in

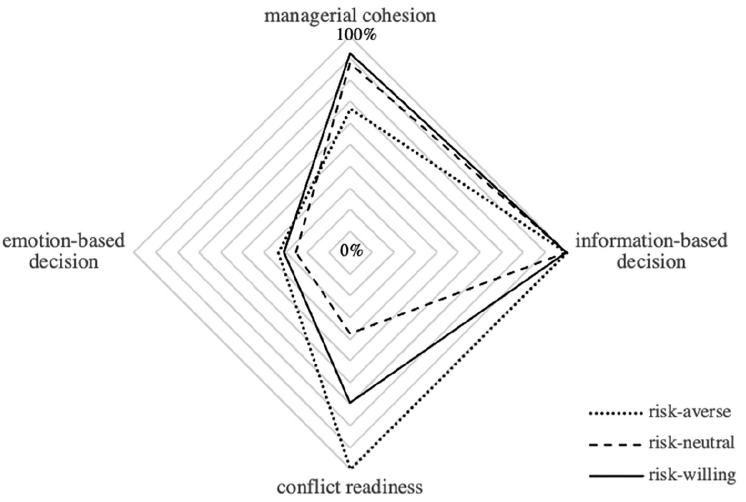

Figure 4.
Characterization of BMI decision-making, based on manager' risk willingness (in percentages)

Note(s): The percentages reflect how many of the respondents' showed symptoms of the respective theme (e.g., 100% of the respondents of all 3 risk types decide information-based)

conflict are those in the team who mainly try to avoid confrontation. They seem to mediate between risk-averse and risk-willing managers by driving the process of weighing up the pros and cons.

5. Discussion

Based on interviews with 26 managers, this study found that good BMI decisions are characterized by

(1) the interplay of managerial cohesion and conflict readiness and

(2) the interplay of information-based and emotion-based decision-making behavior.

Four group biases were observed, namely groupthink, social influence, hidden profile and group polarization with managerial conflict readiness playing a crucial role in BMI decision-making. As expected, BMI decision-making behavior differs among risk-averse, risk-neutral and risk-willing managers. In contrast to previous research (Chesbrough, 2010; Laukkanen and Patala, 2014), our findings show that risk aversion can improve the BMI process. Risk-averse managers have an increased need for information which is particularly important in today's data and information heavy environment (Acciarini *et al.*, 2021). Since there is a link between using complete information and choosing the right strategy (Citroen, 2011), risk-averse and information-seeking behavior can therefore increase decision quality. Finally, managers did not perceive the two phenomena mentioned by Zhang and Casari (2012) that groups make riskier decisions than individuals in certain situations (risky shift) and vice versa (cautious shift).

5.1 Managerial cohesion and conflict readiness as important counterparts for effective BMI decision-making

The results show that good BMI decisions are made by balancing managers' individual conflict readiness with managerial cohesion. Although four group biases indicate managerial cohesion in BMI decisions, conflict readiness is perceived as most relevant and, interestingly, is also predominantly perceived positively to improve decision quality. We think that conflict is beneficial for effective BMI decision-making. Effective BMI decisions require both individual conflict readiness and managerial cohesion, because the mere presence of conflict readiness without managerial cohesion would prevent a common consensus, which is essential for timely decisions.

Aggregate dimension	2nd-order themes	Total numbers of respondents (n = 24)	Risk-averse 3	Risk-neutral 8	Risk-willing 13
Group interaction	Managerial cohesion	*21*	2	7	12
	Conflict readiness	*15*	3	3	9
Decision base	Information-based decisions	*24*	3	8	13
	Emotion-based decisions	*7*	1	2	4

Note(s): Due to lacking information about the risk willingness of the interviewees 6.2 and 12.1 the table refers to $n = 24$

Table 4. Quantitative analysis of group interaction and BMI decision behavior, based on managers' risk willingness (absolute numbers)

Managerial cohesion occurs when managers prioritize group harmony over making the right decision (Park, 2000). Mullen *et al.* (1994) explained that managerial cohesion reduces conflict in groups. Conversely, Manata and Bozeman (2022) have recently shown that conflicts in groups strongly cause managerial cohesion. They measure only a weak opposing influence of managerial cohesion on conflict in groups. However, we think, if peer pressure limits an individual's confidence to pursue an alternative solution the resulting overly cohesive leadership could prevent good decisions. Peer pressure would encourage groupthink in the form of premature concurrence seeking due to stress and anxiety, as Janis (1982) also warns. We therefore also agree with Chapman (2006) that the premature concurrence seeking due to groupthink would promote inadequate information search and consequently inadequate evaluation of different solution alternatives.

Two reasons for groupthink that produces managerial cohesion are identified in the literature: either a pessimistic assessment of a group's ability to successfully solve a problem, which manifests itself in a defensive response in the form of "collective avoidance" (Chapman, 2006) or an overly optimistic assessment of the group's ability to solve a problem which results in an unrealistically high confidence for success (Whyte, 1998). Our results overlap with those of Whyte (1998) and indicate an overly optimistic assessment of business opportunities by board members. This is problematic because, first, overly optimistic assessments of the situation lead people to take excessive risks in strategic decisions (Whyte, 1998). Second, low-level skilled people tend to be more self-confident and perceive themselves as more competent than they really are, while competent people tend to underestimate their abilities, as described in the Dunning-Kruger effect (Kruger and Dunning, 1999; Ehrlinger *et al.*, 2005). This paradox highlights a critical deficiency in human cognition which is particularly dangerous at the executive level: the gap between actual expertise and perceived competence. This phenomenon stems from two core aspects: perceiving "known unknowns" and "unknown unknowns" which relates to metacognition, a unique human trait of self-reflection. Many individuals lack this metacognitive capacity making them blind to the degree of their ignorance (Huang, 2013). This ignorance is especially pronounced in those with excessive self-perceptions of their abilities. Such individuals struggle to critically evaluate information and their own performance, leading to biased decision-making (Nold and Michel, 2022). Huang (2013) added that people in authority often make decisions without adequate knowledge, failing to notice crucial information, or overestimating their expertise. Understanding the extent of this discrepancy among incompetent individuals is key to understanding the roots and consequences of biased decisions at managerial level. Nold and Michel (2022) compare the behavior of managers and employees. They show that managers not only overestimate their own abilities, especially in the dimension of success, but they underestimate the abilities of their employees which makes them blind to relevant information from their employees.

However, we observed that boards need managers' approval to solve problems together as a top management team. This is consistent with Festinger (1950) who stated that group consensus is essential to the effectiveness of boards. Honest dialog and attempts to convince other board members should help prevent disagreements. However, we also found in the interviews that social norms may trigger the premature pursuit of agreement. In this sense, we agree with McCauley (1989) and caution that social norms may favor developing friendly relationship over a critical evaluation of ideas. Thus, although collective efficacy has a positive impact on team effectiveness as recently shown by Elms *et al.* (2022), social norms could lead to an undesirable BMI decision. For further elaboration of the complex relationships between managerial cohesion and organizational performance, see Mullen *et al.* (1994) and Banwo *et al.* (2015).

The interplay of managerial cohesion and conflict readiness in BMI decision-making shown in this study also overlaps with the definition of leadership unity by Doz and Kosonen (2010).

Along with strategic sensitivity and resource fluidity, leadership unity (also labeled as collective commitment, de Diego Ruiz *et al.*, 2023) is one of the three firm-level abilities that constitute strategic agility, which contributes to higher firm performance (Doz and Kosonen, 2010; Hock *et al.*, 2016). Leadership unity enables bold decisions to be made quickly through mutual support from the top management team (Doz and Kosonen, 2010). Leadership unity among senior executives helps organizations cooperate and jointly commit to risky decisions necessary for BMI implementation (Clauss *et al.*, 2021). Our interviewees made it clear that it is essential to efficiently distribute information among the management team and to stimulate constant dialog to achieve mutual commitment (Clauss *et al.*, 2021).

5.2 Information-based dominates emotion-based BMI decision-making

The respondents stated that they make decisions based on information rather than emotion. We have our reservations as to whether this is always the reality. Nevertheless, the respondents' perception is consistent with Coffeng *et al.*'s (2021) statement that the main task of boards is to carefully weigh the pros and cons of different strategic options. All relevant actors need to gather and analyze comprehensive information (Acciarini *et al.*, 2021) both rationally and intuitively (Calabretta *et al.*, 2017). We can apply Simon's (1987) traditional rational and intuitive perspective on information sharing in decision-making to our study. While information gathering and analysis reflects the rational perspective of strategic BMI decision-making, emotion-based decision-making represents the intuitive perspective. In this context, we point out the connection between intuition and emotion in complex decisions as described by Matzler *et al.* (2007). In the literature, the terms "intuition", "emotions" and "gut feeling" are used very closely together. Hence, a clear distinction between the terms is difficult. However, our results fit the findings of Andersen *et al.* (2022) and Korherr *et al.* (2022) who also observe a shift from intuition-driven to data-driven decision-making processes and that many companies now want to be guided less by their gut feeling and more by data. Andersen *et al.* (2022) literally describe that today decision-makers struggle with this shift 'For some companies, it is a "crossroads" decision in terms of balancing when to follow intuition and when to follow data (Andersen *et al.*, 2022, p. 30).

Our respondents rated overly emotion-based decision-making as an inappropriate, unfavorable decision strategy. Indeed, some scholars characterize emotions as undesirable biases (e.g. Shiv *et al.*, 2005). However, other researchers disagree and assert that strong emotions lead to higher decision quality (Seo and Barrett, 2007). Vuori and Huy (2022) recently investigated how emotions can contribute to higher decision quality. Their observation could also be relevant to our results. They explain that top managers re-evaluate strategic options using data-driven analysis through group interaction which can gradually change their emotions. In this way, top managers regulate their emotions and achieve higher decision quality and radical change. This explanation suggests that, as we show with our BMI decision matrix, an interplay of emotion- and information-based decision behavior is indeed required to make sound BMI decisions.

As identified in the literature (Van Knippenberg and Schippers, 2007), our respondents believed that informationally diverse boards gain more perspectives through constructive dialog, thereby increasing decision quality. Participants' perception is intuitive and common knowledge but is inconsistent with previous findings (e.g. Lu *et al.*, 2012; Schulz-Hardt and Mojzisch, 2012; Sohrab *et al.*, 2015) showing that groups do not share information and knowledge sufficiently (He *et al.*, 2021; Silva de Garcia *et al.*, 2022; Goncalves *et al.*, 2023) and therefore make biased decisions (Brodbeck *et al.*, 2007). We know that due to confirmation bias, individual managers tend to search for information that confirms their existing beliefs and actually stick to their initial preference (Stasser and Titus, 2003; Coffeng *et al.*, 2021; Nicholson *et al.*, 2022). In our study, managers perceived themselves as reflective, although

they did not clearly indicate that they were aware of confirmation bias, either at the individual or group level. From this, we conclude that managers may have had a false sense of security and overconfidence in the quality of their decisions. This assumption is consistent with the findings of Coffeng *et al.* (2021), who demonstrated this overconfidence in a hidden profile experiment with nonprofit organizations. Since our sample comprises 24 male and two female participants, we are not inclined to conclude any gender differences. Though, Nicholson *et al.* (2022) observe that after receiving full information, female decision-makers were more able to correct their initial suboptimal decision. Compared to their male counterparts, women also show lower overall confidence in their selection decision (Nicholson *et al.*, 2022).

Our surveyed managers felt that faster consensus is better achieved when fewer options were discussed indicating the initial majority preference even among highly experienced decision-makers. As Wittenbaum *et al.* (2004) explained, fewer options facilitate quick agreements, which is necessary in dynamic environments and the resulting time pressure. This is in line with Wu *et al.* (2022), who explain in their paper entitled "Time pressure changes how people explore and respond to uncertainty". However, we must raise awareness that quick agreements may have a negative impact on decision quality if the information is not thoroughly collected and analyzed. Although various discussion procedures to overcome confirmation bias in groups are recommended in the literature, they remain mostly ineffective (Sohrab *et al.*, 2015; Coffeng *et al.*, 2021). Therefore, future experimental studies should develop effective discussion procedures that incorporate time pressure, as already cautioned by Coffeng *et al.* (2021).

Depending on their individual risk willingness, respondents had different perceptions on how emotion-based they were in making strategic decisions. However, our study did not distinguish between positive and negative affect. Other researchers show that information processing is poorer when negative emotions are present and that anxiety may induce a tendency towards excessive risk-taking, while others predict more risk-averse behavior when a positive mood is present and vice versa (Chapman, 2006). Future studies could therefore examine the interrelationship between individual risk willingness and emotions in strategic decision-making.

5.3 Individual risk willingness as a success factor for BMI decisions

It is well known that entrepreneurial behavior usually requires a risk-willing attitude in order to seize market opportunities (Janney and Dess, 2006). Other authors argue that entrepreneurs sense opportunities because they perceive lower risk (Krueger and Brazeal, 1994) or that they proactively minimize risk (Bateman and Crant, 1993; Acedo and Florin, 2007). Even though studies showed that entrepreneurs are generally more willing to take risks than managers in established companies (Begley and Boyd, 1987; Stewart and Roth, 2001), managers are also called upon to accept a certain degree of risk to enable intrapreneurship in the sense of BMI.

While some authors claim that high risk-taking attitudes hinder innovation efforts (e.g. Brooks *et al.*, 2023), others state that a positive attitude to risk taking, coupled with effective risk management, can enhance innovation performance (Lendowski *et al.*, 2022). Laukkanen and Patala (2014) suggested that an overly negative attitude towards risk hinders successful implementation of BMI. Our results clearly contradict this conclusion. Surprisingly, our interviewees negated the previous negative framing of risk aversion by evaluating it as a valuable "critical voice" for successful BMI decisions. This observation fits with the philosophical nature of distributive justice theory, more specifically Rawls' (1971) notion that the more risk averse a person is, the more benevolent they are. We could imagine that board members may evaluate the cautious decision-making behavior of risk-averse colleagues as a protective shield against demonstrably wrong decisions. This argumentation fits with the

findings of Brennan *et al.* (2008) whose experiment provided evidence that consideration of other-regarding concerns when monetary payoffs are common knowledge. Even if the strategic BMI decisions affect board members' pay at some point in the future, the potential monetary payoffs are not yet known at the time the BMI decisions are made. We therefore assume that board members are referring to the current, already known payouts and not to the potential payouts in the future.

We have found that risk-averse decision-makers who lack information perceive higher uncertainty than risk-willing decision-makers. As a result, risk-averse individuals are highly engaged in information gathering. We believe that this behavior is beneficial for successful BMI decisions because it increases the quality of the decision rather than the speed of the decision. This is consistent with the findings of Acedo and Florin (2007) who found evidence that risk perception in the context of strategic opportunities is influenced by an individual's prior experience related to the opportunity, their cognitive style of information acquisition and analysis and their tolerance for ambiguous situations. Song *et al.* (2022) further discovered that differences in risk perception among team members can positively influence information adoption with learning willingness playing a mediating role. While Song *et al.* (2022) emphasized the positive impact of diverse risk perceptions on information adoption within teams, our findings extend this by demonstrating that individual risk aversion in decision-makers leads to a more thorough and quality-focused information gathering process, crucial for effective BMI. The desire for information by risk-averse managers observed in this study also confirms Kogan and Wallach's (1964) view that risk-averse decision-makers consider a broader range of information (conjunctive decision behavior) than those with a higher risk willingness who consider only a narrow range of criteria (disjunctive decision behavior).

The risk-averse decision-makers do not appear to be the stubborn ones in the team who hinder change, as initially expected. Rather, they require good arguments as to why the BM should change and why they should accept the risks associated with the BMI. In doing so, they proactively try to increase the amount of information on which to base a decision. In the interest of business development, risk-averse managers are more inclined to welcome constructive dialog than their risk-neutral and risk-willing colleagues (1) if they are firmly convinced that their decision option is "really" the best one for the company's success, (2) if the other team members cannot convince them with strong pro arguments for their proposal and (3) if they perceive the counter arguments for the others' options to be very strong. Therefore, the perceived uncertainty by risk-averse individuals seems to have a positive effect on the outcome of the BMI decision because they wisely weigh pros and cons until all doubts are removed. This behavior is indeed beneficial as it can prevent board members from overestimating their business opportunities in terms of BMI.

We can also interpret the information-seeking behavior of risk-averse board members as an *ex ante* risk management strategy. More specifically, our results suggest that risk-averse managers intend to reduce risk before they make risky decisions rather than seeking solutions to deal with the consequences of risky decisions. In this respect, we refute the paradox of risk-averse vs risk-seeking risk management behavior explained by Van Winsen *et al.* (2016). In contrast to our results, Van Winsen *et al.* (2016) concluded for their sample in agriculture that risk-averse managers are less likely to adopt *ex ante* risk management strategies and more likely to rely on ex-post curative measures.

The role of risk-willing managers in strategic decision-making is complex and requires further investigation, as it may be influenced by various theories such as agency theory, behavioral theory and prospect theory (Hoskisson *et al.*, 2017). Our findings shed light on this blind spot and contribute to the idea that risk-willing managers have the greatest need for managerial cohesion when making strategic decisions. We conclude from our results that risk-willing managers may need the security and strength of a team to support their

preference for riskier decisions. They may assess decision-making in a group as a kind of safety net for riskier decisions and therefore feel stronger in a team than alone. While our interviews revealed that risk-willing managers promote managerial cohesion by emphasizing business opportunities and striving for unity, it is the risk-averse managers who show the highest conflict readiness. These findings contradict Lahno *et al.* (2015) who conclude that the degree of risk aversion *per se* has no correlation with conflict. However, they add that differences in risk attitudes between individuals can lead to interpersonal conflicts between them. We hypothesize that the risk-averse attitude is an important factor for the long-term survival of an organization, because risk-averse managers weigh the pros and cons extensively until uncertainty is sufficiently reduced. Though, our results also show that board members are not driven by the dynamics of a group discussion and get carried away quickly. However, risk-willing decision-makers might perceive this behavior as slowing down or preventing efficient BMI. Therefore, we cannot confirm risky or cautious shifts by the decision group as Zhang and Casari (2012) claim. Rather, individual risk willingness seems to be a stable companion in BMI decision-making.

6. Conclusion, implications and future research

The objective of this study was to provide insight into how managers interact as a group when making BMI decisions. We studied the role of management group biases and board members' willingness to take risks. 26 interviews were conducted with managers from thirteen companies in four industries: mobility, manufacturing, healthcare and energy. We conducted a thematic analysis following Gioia's guidelines (Gioia *et al.*, 2013) to answer three research questions. In relation to our first research question, our results showed that four typical group biases predominantly influence the strategic BMI group decision-making: Groupthink, social influence, hidden profile and group polarization. The symptoms of the hidden profile paradigm (Stasser and Titus, 2003) and groupthink theory (Janis, 1982) were explicitly identified in the interview transcripts.

To answer the second research question, we developed a BMI decision matrix identifying key foundations of the BMI decision-making process. From the decision basis perspective, we found that board members make BMI decisions primarily based on information rather than emotion. From a group interaction perspective, we observed an interplay between managerial cohesion and individual conflict propensity, where managerial cohesion seems to play a major role. The managers interviewed felt that they did indeed influence each other in decision-making. However, they did not see this as a particularly significant obstacle because of information sharing. In general, there is a strong desire for unity which may be underlined by managers' tendency to conform to the behavior or opinions of other decision-makers and their desire to be part of the management team.

Our third research question investigated the role of individual risk willingness in making BMI decisions. Using our BMI decision matrix, we were able to illustrate differences in BMI decision-making behavior between the three risk-willingness types. While risk-willing and risk-neutral managers showed the highest degree of managerial cohesion while risk-averse decision-makers in particular reported symptoms of conflict readiness. In comparison, risk-neutral managers are those decision-makers who rarely engage in conflict themselves.

In contrast to previous literature, our results suggest that risk-averse decision-makers do not hinder but rather improve BMI decisions by immediately demanding sufficient information before making the decision that is intended to reduce uncertainty. In doing so, they prevent their boards from making hasty BMI decisions because they have a high conflict readiness and therefore scrutinize different options intensively. If the top management team succeeds in providing sufficient information to all decision-makers involved, the other decision-makers may also be willing to vote for an option that is perceived as riskier.

Meanwhile, the results show that the willingness of decision-makers to take risks appears to be a fixed characteristic and does not change dynamically. Therefore, managers in the BMI decision-making process are not easily carried away by the higher risk willingness of their team members.

6.1 Theoretical contributions

This paper enriches three areas of literature that are of great practical importance to business executives. *First*, this work contributes to the part of the BM literature that explains BM as a cognitive schema. While previous studies in this area of research have focused on how BMs are manifested by social interaction (Massa *et al.*, 2017) we show how social interaction influences the design of a new BM. The empirical data suggests that social interaction determines the change of the collective schema of an existing BM to a new collective schema in the new BM. Our work shows that this cognitive change is primarily accompanied by two aspects of social interaction: managerial cohesion and board members' willingness to engage in conflict.

Second, we contribute to BMI research that views BMI as an organizational process. Although several scholars have looked at BMI process models from different angles (e.g. De Reuver *et al.*, 2013; Frankenberger *et al.*, 2013), there has been too little known about the cognitive behavior and individual and team characteristics within these BMI process models (Spieth *et al.*, 2023). Our research contributes to closing this gap by investigating how managing directors interact during the BMI decision-making process and how the board that collectively undergoes the BMI process can be characterized in general. To this end, we introduce the BMI decision matrix to the BMI literature which frames BMI decisions from two different perspectives: the social interaction perspective and the decision base perspective. In addition to managerial cohesion and conflict readiness we also shed light on the role of emotions and information as the board goes through the organizational change process of BMI. This study also adds value to the BMI literature from a methodological perspective because interview-based data has been lacking in this literature to date. Our 26 in-depth interviews with managing directors contribute to gaining deeper insights into the BM adaptation process (Saebi *et al.*, 2017).

We contribute to the ongoing debate on the role of risk perception and risk willingness during BMI (see, e.g. Taran *et al.*, 2013; Euchner and Ganguly, 2014; Brillinger *et al.*, 2020). While previous BMI literature has emphasized that uncertainty and risk are a typical aspect of BMI, it has not clarified how managers deal with them during BMI decision-making (Brillinger *et al.*, 2020). The present work sheds light on this blind spot. We show that managers' differing risk appetites influence their desire for board unity. Our work offers a new perspective on the relevance of risk aversion for BMI decisions by refuting the previous negative framing of risk-aversion for the implementation of BMI in an organization (Laukkanen and Patala, 2014). Instead, the results show that risk aversion represents an opportunity to improve the quality of group decisions and thus promote the successful implementation of BMI. Although we have known that BMI requires competent leadership, we lacked knowledge about the role of leaders in BMI and their interaction (Foss and Stieglitz, 2015; Bashir and Verma, 2019). In addition, the internal processes associated with organizational change, such as the BMI decision-making process, need further investigation (Torkkeli *et al.*, 2015). We contribute to filling these gaps by providing insights into group interactions between managing directors during the strategic BMI process.

Third, this paper contributes to the literature on strategic group decision-making. To date, this line of research has lacked qualitative studies to understand complex strategic decision-making processes (Asemokha *et al.*, 2021), especially on the effects of information sharing during debate (e.g. Coffeng *et al.*, 2021). The managerial characteristics in decision-making

processes have needed further investigations (Korherr *et al.*, 2022). Our qualitative data sheds light on these blind spots by empirically investigating which group biases are prevalent in strategic BMI decisions in boards. Our results confirm previous studies that emphasize the high relevance of group confirmation bias even at the top management level (Stasser and Titus, 2003; Brodbeck *et al.*, 2007; Coffeng *et al.*, 2021). However, in the BMI context, we suggest that four group biases mainly influence BMI decisions: groupthink, social influence, hidden profile and group polarization. In addition, we have learned in this study that the degree of individual conflict readiness depends on managers' risk willingness. It is clear that particularly risk-averse managers accept conflict in BMI decision-making and thus play an important role in the long-term success of an organization. This finding offers a new perspective on risk aversion in innovation processes. Our study also offers a new characteristic for the classification of managers in strategic decisions and thus extends the current findings of Korherr *et al.* (2022). Future studies could further examine the opportunities that arise for organizations through risk-averse managers rather than confirming their negative role in an organization's innovation behavior.

6.2 Managerial implications

Regarding potential group biases in strategic BMI decisions, we conclude that managers should be aware of and pay attention to the following pitfalls: groupthink, social influence, hidden profile and group polarization. We confirm that executives prefer harmony to dissent (groupthink) and that they are influenced by the other executives with whom they interact. Consequently, managers tend to change existing attitudes to conform with others in the group (social influence). Our results also show evidence that executives predominantly focus only on information that is available to all board members (hidden profile) and their preferences reinforce each other (group polarization).

Although managers consider themselves highly reflective and think that they make decisions mainly based on information, previous studies have shown that due to their biased self-reflection they do not use all information (e.g. Kruger and Dunning, 1999; Nold and Michel, 2022; Sohrab *et al.*, 2015). In fact, even highly experienced decision-makers do not always find the best solution, also due to too early agreements. An effective way to overcome the hidden profile effect is to create a supportive environment that allows for dissent. In the BMI context, this requires an entrepreneurial culture that encourages managers to explore and seize new business opportunities. In addition, managers should create structures that enable them to consciously absorb information from their employees in order to overcome their potential lack of self-reflection.

Some managers need more information to make strategic decisions than others. Managers are faced with the trade-off between fast decision-making to remain competitive or high decision quality. As decisions become increasingly data-driven, managers will be even more challenged to integrate technology to support decision-making. Certainly, business intelligence systems can help companies to select the most relevant data and pool information to increase the speed of decision-making needed to respond to threats or opportunities required to outperform competitors. Our findings align with recent works by Berg *et al.* (2023) and Kanbach *et al.* (2023) that understanding artificial intelligence (AI) technologies is indispensable to accelerate learning to support value creating BMI. We also agree with Haefner and Gassmann (2023) and expect that AI technologies will fundamentally change how organizations collect and process information in innovation processes.

Managers are the ones who are supposed to determine the right direction for their company. It is essential to pay attention to the diverse voices within the decision-making team. It is common knowledge that critical perspectives are indispensable for company success. We build upon Manata and Bozeman (2022) who demonstrated the positive impact of

group conflict on group cohesion and that opposing perspective are not mere opinions but pivotal contributions that can significantly enhance the quality of BMI decision-making. Hence, by integrating various viewpoints managers can facilitate a more comprehensive and robust decision-making process.

In this sense, it becomes fundamental for managers to shift their perception of risk-averse colleagues. Often, those who are cautious in their approach are viewed as barriers to progress. However, we suggest that it is more productive to view risk-averse individuals as enablers of successful BMI implementation. They are not only "part of the game" but their caution and attention to detail is valuable in identifying potential pitfalls. Consequently, risk-averse individuals help create a viable BM that not only fosters innovation but also mitigates risks which increases the probability of success.

6.3 Limitations and future research

One of the limitations of the study is the limited sample of 26 respondents from four industries, all in Germany. Samples from other geographic areas or cultures may yield different results. Future work could extend the data by applying a survey design to quantitatively investigate the role of individual risk willingness on BMI. An interesting question here would be what type of individual risk willingness promotes different BMI strategies (e.g. exploitation versus exploration strategy). Furthermore, this study used a qualitative research design and thus reflects managers' perceptions of group interaction during strategic decision-making. Experimental studies could further explore the topic by developing and applying specific BMI decision-making tasks for board members. Future studies could also develop an approach that measures the actual ratio between the information- and emotion-based decision base. We also see the need for future studies to identify ways for overcoming or mitigating the Dunning–Kruger effect in strategic decisions.

References

Aagaard, A. and Nielsen, C. (2021), "The fifth stage of business model research: the role of business models in times of uncertainty", *Journal of Business Models*, Vol. 9 No. 1, pp. 77-90.

Abdelkafi, N., Makhotin, S. and Posselt, T. (2013), "Business model innovations for electric mobility—what can be learned from existing business model patterns?", *International Journal of Innovation Management*, Vol. 17 No. 1, pp. 1-42, doi: 10.1142/s1363919613400033.

Acciarini, C., Brunetta, F. and Boccardelli, P. (2021), "Cognitive biases and decision-making strategies in times of change: a systematic literature review", *Management Decision*, Vol. 59 No. 3, pp. 638-652, doi: 10.1108/md-07-2019-1006.

Acedo, F.J. and Florin, J. (2007), "Understanding the risk perception of strategic opportunities: a tripartite model", *Strategic Change*, Vol. 16 No. 3, pp. 97-116, doi: 10.1002/jsc.787.

Achtenhagen, L., Melin, L. and Naldi, L. (2013), "Dynamics of business models–strategizing, critical capabilities and activities for sustained value creation", *Long Range Planning*, Vol. 46 No. 6, pp. 427-442, doi: 10.1016/j.lrp.2013.04.002.

Ahmadzadeh, S., Safari, A. and Teimouri, H. (2022), "Collective stupidity: influences on decision-making in knowledge-based companies", *Management Decision*, Vol. 60 No. 5, pp. 1257-1295, doi: 10.1108/md-10-2020-1380.

Alguezaui, S. and Filieri, R. (2010), "Investigating the role of social capital in innovation: sparse versus dense network", *Journal of Knowledge Management*, Vol. 14 No. 6, pp. 891-909, doi: 10.1108/13673271011084925.

Altinay, L., Saunders, M.N. and Wang, C.L. (2014), "The influence of culture on trust judgments in customer relationship development by ethnic minority small businesses", *Journal of Small Business Management*, Vol. 52 No. 1, pp. 59-78, doi: 10.1111/jsbm.12033.

Alvarez, S.A. and Barney, J.B. (2005), "How do entrepreneurs organize firms under conditions of uncertainty?", *Journal of Management*, Vol. 31 No. 5, pp. 776-793, doi: 10.1177/0149206305279486.

Amit, R. and Zott, C. (2001), "Value creation in e-business", *Strategic Management Journal*, Vol. 22 Nos 6-7, pp. 493-520, doi: 10.1002/smj.187.

Amit, R. and Zott, C. (2012), "Creating value through business model innovation", *MIT Sloan Management Review*, Vol. 53, pp. 41-49.

Amit, R. and Zott, C. (2015), "Crafting business architecture: the antecedents of business model design", *Strategic Entrepreneurship Journal*, Vol. 9 No. 4, pp. 331-350, doi: 10.1002/sej.1200.

Andersen, T.C.K., Aagaard, A. and Magnusson, M. (2022), "Exploring business model innovation in SMEs in a digital context: organizing search behaviours, experimentation and decision-making", *Creativity and Innovation Management*, Vol. 31 No. 1, pp. 19-34, doi: 10.1111/caim.12474.

Andreini, D., Bettinelli, C., Foss, N.J. and Mismetti, M. (2022), "Business model innovation: a review of the process-based literature", *Journal of Management and Governance*, Vol. 26 No. 4, pp. 1089-1121, doi: 10.1007/s10997-021-09590-w.

Andries, P., Debackere, K. and Van Looy, B. (2013), "Simultaneous experimentation as a learning strategy: business model development under uncertainty", *Strategic Entrepreneurship Journal*, Vol. 7 No. 4, pp. 288-310, doi: 10.1002/sej.1170.

Arslan, R.C., Brümmer, M., Dohmen, T., Drewelies, J., Hertwig, R. and Wagner, G.G. (2020), "How people know their risk preference", *Scientific Reports*, Vol. 10 No. 1, pp. 1-14, doi: 10.1038/s41598-020-72077-5.

Asemokha, A., Musona, J., Ahi, A., Torkkeli, L. and Sareenketo, S. (2021), "Business model innovation in the internationalization of SMEs: the role of causation and effectuation", *Proceedings of the 54th Hawaii International Conference on System Sciences*, pp. 5059-5068.

Aspara, J., Hietanen, J. and Tikkanen, H. (2010), "Business model innovation vs replication: financial performance implications of strategic emphases", *Journal of Strategic Marketing*, Vol. 18 No. 1, pp. 39-56, doi: 10.1080/09652540903511290.

Baden-Fuller, C. and Haefliger, S. (2013), "Business models and technological innovation", *Long Range Planning*, Vol. 46 No. 6, pp. 419-426, doi: 10.1016/j.lrp.2013.08.023.

Baker, R.J., Laury, S.K. and Williams, A.W. (2008), "Comparing small-group and individual behavior in lottery-choice experiments", *Southern Economic Journal*, Vol. 75 No. 2, pp. 367-382, doi: 10.1002/j.2325-8012.2008.tb00909.x.

Bang, D. and Frith, C.D. (2017), "Making better decisions in groups", *Royal Society Open Science*, Vol. 4 No. 8, 170193, doi: 10.1098/rsos.170193.

Banwo, A.O., Du, J. and Onokala, U. (2015), "The impact of group managerial cohesion on organizational performance: the Nigerian case", *International Journal of Business and Management*, Vol. 10 No. 6, pp. 146-154, doi: 10.5539/ijbm.v10n6p146.

Barsade, S.G. (2002), "The ripple effect: emotional contagion and its influence on group behavior", *Administrative Science Quarterly*, Vol. 47 No. 4, pp. 644-675, doi: 10.2307/3094912.

Bashir, M. and Verma, R. (2019), "Internal factors and consequences of business model innovation", *Management Decision*, Vol. 57 No. 1, pp. 262-290, doi: 10.1108/md-11-2016-0784.

Bateman, T.S. and Crant, J.M. (1993), "The proactive component of organizational behavior: a measure and correlates", *Journal of Organizational Behavior*, Vol. 14 No. 2, pp. 103-118, doi: 10.1002/job.4030140202.

Bazerman, M.H. and Moore, D.A. (2009), *Judgment in Managerial Decision Making*, John Wiley & Sons, Hoboken, NJ.

Begley, T.M. and Boyd, D.P. (1987), "A comparison of entrepreneurs and managers of small business firms", *Journal of Management*, Vol. 13 No. 1, pp. 99-108, doi: 10.1177/014920638701300108.

Berg, J., Raj, M. and Seamans, R. (2023), "Capturing value from artificial intelligence", *Academy of Management Discoveries*, Vol. 9 No. 4, pp. 424-428, doi: 10.5465/amd.2023.0106.

Björkdahl, J. and Holmén, M. (2013), "Business model innovation – the challenges ahead", *International Journal of Product Development*, Vol. 18 Nos 3/4, pp. 213-225.

Björkdahl, J., Fallahi, S. and Holmén, M. (2022), "Explaining business model innovation processes: a problem formulation and problem-solving perspective", *Industrial Marketing Management*, Vol. 105, pp. 223-239, doi: 10.1016/j.indmarman.2022.05.012.

Blais, A.R. and Weber, E.U. (2006), "A domain-specific risk-taking (DOSPERT) scale for adult populations", *Judgment and Decision Making*, Vol. 1 No. 1, pp. 33-47, doi: 10.1017/s1930297500000334.

Bock, A.J., Opsahl, T., George, G. and Gann, D.M. (2012), "The effects of culture and structure on strategic flexibility during business model innovation", *Journal of Management Studies*, Vol. 49 No. 2, pp. 279-305, doi: 10.1111/j.1467-6486.2011.01030.x.

Bocken, N.M. and Geradts, T.H. (2020), "Barriers and drivers to sustainable business model innovation: organization design and dynamic capabilities", *Long Range Planning*, Vol. 53 No. 4, 101950, doi: 10.1016/j.lrp.2019.101950.

Böttcher, T.P., Weking, J., Hein, A., Böhm, M. and Krcmar, H. (2022), "Pathways to digital business models: the connection of sensing and seizing in business model innovation", *The Journal of Strategic Information Systems*, Vol. 31 No. 4, 101742, doi: 10.1016/j.jsis.2022.101742.

Braun, V. and Clarke, V. (2006), "Using thematic analysis in psychology", *Qualitative Research in Psychology*, Vol. 3 No. 2, pp. 77-101, doi: 10.1191/1478088706qp063oa.

Brennan, G., González, L.G., Güth, W. and Levati, M.V. (2008), "Attitudes toward private and collective risk in individual and strategic choice situations", *Journal of Economic Behavior and Organization*, Vol. 67 No. 1, pp. 253-262, doi: 10.1016/j.jebo.2007.02.001.

Brillinger, A.S., Els, C., Schäfer, B. and Bender, B. (2020), "Business model risk and uncertainty factors: toward building and maintaining profitable and sustainable business models", *Business Horizons*, Vol. 63 No. 1, pp. 121-130, doi: 10.1016/j.bushor.2019.09.009.

Brodbeck, F.C., Kerschreiter, R., Mojzisch, A. and Schulz-Hardt, S. (2007), "Group decision making under conditions of distributed knowledge: the information asymmetries model", *Academy of Management Review*, Vol. 32 No. 2, pp. 459-479, doi: 10.5465/amr.2007.24351441.

Brooks, S., Sahaym, A., Datta, A. and Srivastava, S. (2023), "Risky combination: the role of managerial perceptions of social media use and entrepreneurial orientation on SME innovation", *Management Decision*, Vol. 61 No. 1, pp. 33-56, doi: 10.1108/md-03-2021-0385.

Bruni, E. and Comacchio, A. (2023), "Configuring a new business model through conceptual combination: the rise of the Huffington Post", *Long Range Planning*, Vol. 56 No. 1, 102249, doi: 10.1016/j.lrp.2022.102249.

Bucherer, E., Eisert, U. and Gassmann, O. (2012), "Towards systematic business model innovation: lessons from product innovation management", *Creativity and Innovation Management*, Vol. 21 No. 2, pp. 183-198, doi: 10.1111/j.1467-8691.2012.00637.x.

Calabretta, G., Gemser, G. and Wijnberg, N.M. (2017), "The interplay between intuition and rationality in strategic decision making: a paradox perspective", *Organization Studies*, Vol. 38 Nos 3-4, pp. 365-401, doi: 10.1177/0170840616655483.

Casadesus-Masanell, R. and Ricart, J.E. (2010), "From strategy to business models and onto tactics", *Long Range Planning*, Vol. 43 Nos 2-3, pp. 195-215, doi: 10.1016/j.lrp.2010.01.004.

Casadesus-Masanell, R. and Ricart, J.E. (2011), "How to design a winning business model", *Harvard Business Review*, Vol. 89 Nos 1/2, pp. 100-107.

Chapman, J. (2006), "Anxiety and defective decision making: an elaboration of the groupthink model", *Management Decision*, Vol. 44 No. 10, pp. 1391-1404, doi: 10.1108/00251740610715713.

Chesbrough, H. (2010), "Business model innovation: opportunities and barriers", *Long Range Planning*, Vol. 43 Nos 2-3, pp. 354-363, doi: 10.1016/j.lrp.2009.07.010.

Chesbrough, H. and Rosenbloom, R.S. (2002), "The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies", *Industrial and Corporate Change*, Vol. 11 No. 3, pp. 529-555, doi: 10.1093/icc/11.3.529.

Citroen, C.L. (2011), "The role of information in strategic decision-making", *International Journal of Information Management*, Vol. 31 No. 6, pp. 493-501, doi: 10.1016/j.ijinfomgt.2011.02.005.

Clauss, T., Kraus, S., Kallinger, F.L., Bican, P.M., Brem, A. and Kailer, N. (2021), "Organizational ambidexterity and competitive advantage: the role of strategic agility in the exploration-exploitation paradox", *Journal of Innovation and Knowledge*, Vol. 6 No. 4, pp. 203-213, doi: 10.1016/j.jik.2020.07.003.

Coffeng, T., Van Steenbergen, E.F., De Vries, F. and Ellemers, N. (2021), "Quality of group decisions by board members: a hidden-profile experiment", *Management Decision*, Vol. 59 No. 13, pp. 38-55, doi: 10.1108/md-07-2020-0893.

Cooper, D.J. and Kagel, J.H. (2005), "Are two heads better than one? Team versus individual play in signaling games", *American Economic Review*, Vol. 95 No. 3, pp. 477-509, doi: 10.1257/0002828054201431.

Cristofaro, M. (2016), "Reducing biases of decision-making processes in complex organizations", *Management Research Review*, Vol. 40 No. 3, pp. 270-291, doi: 10.1108/mrr-03-2016-0054.

Cyert, R.M. and March, J.G. (1963), "A behavioral theory of the firm", in *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*, Prentice Hall, Englewood Cliffs, NJ.

Dane, E. and Pratt, M.G. (2007), "Exploring intuition and its role in managerial decision making", *Academy of Management Review*, Vol. 32 No. 1, pp. 33-54, doi: 10.5465/amr.2007.23463682.

de Diego Ruiz, E., Almodóvar, P. and del Valle, I.D. (2023), "What drives strategic agility? Evidence from a fuzzy-set qualitative comparative analysis (FsQCA)", *International Entrepreneurship and Management Journal*, Vol. 19 No. 2, pp. 599-627, doi: 10.1007/s11365-022-00820-7.

De Reuver, M., Bouwman, H. and Haaker, T. (2013), "Business model roadmapping: a practical approach to come from an existing to a desired business model", *International Journal of Innovation Management*, Vol. 17 No. 1, 1340006, doi: 10.1142/s1363919613400069.

Deschamps, J.P. (2005), "Different leadership skills for different innovation strategies", *Strategy and Leadership*, Vol. 33 No. 5, pp. 31-38, doi: 10.1108/10878570510616861.

Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J. and Wagner, G.G. (2011), "Individual risk attitudes: measurement, determinants, and behavioral consequences", *Journal of the European Economic Association*, Vol. 9 No. 3, pp. 522-550, doi: 10.1111/j.1542-4774.2011.01015.x.

Doz, Y.L. and Kosonen, M. (2010), "Embedding strategic agility: a leadership agenda for accelerating business model renewal", *Long Range Planning*, Vol. 43 Nos 2-3, pp. 370-382, doi: 10.1016/j.lrp.2009.07.006.

Ehrlinger, J., Gilovich, T. and Ross, L. (2005), "Peering into the bias blind spot: people's assessments of bias in themselves and others", *Personality and Social Psychology Bulletin*, Vol. 31 No. 5, pp. 680-692, doi: 10.1177/0146167204271570.

Eisenhardt, K.M. and Zbaracki, M.J. (1992), "Strategic decision making", *Strategic Management Journal*, Vol. 13 S2, pp. 17-37, doi: 10.1002/smj.4250130904.

Elms, A.K., Gill, H. and Gonzalez-Morales, M.G. (2022), "Confidence is key: collective efficacy, team processes, and team effectiveness", *Small Group Research*, Vol. 54 No. 2, pp. 191-218, doi: 10.1177/10464964221104218.

Eppler, M.J., Hoffmann, F. and Bresciani, S. (2011), "New business models through collaborative idea generation", *International Journal of Innovation Management*, Vol. 15 No. 6, pp. 1323-1341, doi: 10.1142/s1363919611003751.

Euchner, J. and Ganguly, A. (2014), "Business model innovation in practice", *Research Technology Management*, Vol. 57 No. 6, pp. 33-39.

Ferrey, A.E. and Mishra, S. (2014), "Compensation method affects risk-taking in the balloon analogue risk task", *Personality and Individual Differences*, Vol. 64, pp. 111-114, doi: 10.1016/j.paid.2014.02.008.

Festinger, L. (1950), "Informal social communication", *Psychological Review*, Vol. 57 No. 5, pp. 271-292, doi: 10.1037/h0056932.

Figner, B. and Weber, E.U. (2011), "Who takes risks when and why? Determinants of risk taking", *Current Directions in Psychological Science*, Vol. 20 No. 4, pp. 211-216, doi: 10.1177/0963721411415790.

Foss, N.J. and Saebi, T. (2017), "Fifteen years of research on business model innovation: how far have we come, and where should we go?", *Journal of Management*, Vol. 43 No. 1, pp. 200-227, doi: 10.1177/0149206316675927.

Foss, N.J. and Stieglitz, N. (2015), "Business model innovation: the role of leadership", in Foss, N.J. and Saebi, T. (Eds), *Business Model Innovation: the Organisational Dimension*, Oxford University Press, Oxford.

Frankenberger, K., Weiblen, T., Csik, M. and Gassmann, O. (2013), "The 4I-framework of business model innovation: a structured view on process phases and challenges", *International Journal of Product Development*, Vol. 18 Nos 3-4, pp. 249-273, doi: 10.1504/ijpd.2013.055012.

Gambardella, A. and McGahan, A.M. (2010), "Business-model innovation: general purpose technologies and their implications for industry structure", *Long Range Planning*, Vol. 43 Nos 2-3, pp. 262-271, doi: 10.1016/j.lrp.2009.07.009.

Geissdoerfer, M., Savaget, P. and Evans, S. (2017), "The Cambridge business model innovation process", *Procedia Manufacturing*, Vol. 8, pp. 262-269, doi: 10.1016/j.promfg.2017.02.033.

Geissdoerfer, M., Vladimirova, D. and Evans, S. (2018), "Sustainable business model innovation: a review", *Journal of Cleaner Production*, Vol. 198, pp. 401-416, doi: 10.1016/j.jclepro.2018.06.240.

Gigerenzer, G. and Brighton, H. (2009), "Homo heuristicus: why biased minds make better inferences", *Topics in Cognitive Science*, Vol. 1 No. 1, pp. 107-143, doi: 10.1111/j.1756-8765.2008.01006.x.

Gilsing, R., Turetken, O., Grefen, P., Ozkan, B. and Adali, O.E. (2022), "Business model evaluation: a systematic review of methods", *Pacific Asia Journal of the Association for Information Systems*, Vol. 14 No. 4, pp. 26-36, doi: 10.17705/1pais.14402.

Gioia, D.A., Corley, K.G. and Hamilton, A.L. (2013), "Seeking qualitative rigor in inductive research: notes on the Gioia methodology", *Organizational Research Methods*, Vol. 16 No. 1, pp. 15-31, doi: 10.1177/1094428112452151.

Goncalves, T., Curado, C. and Oliveira, M. (2023), "Clarifying knowledge withholding: a systematic literature review and future research agenda", *Journal of Business Research*, Vol. 157, 113600, doi: 10.1016/j.jbusres.2022.113600.

Granig, P. and Hilgarter, K. (2020), "Organisational resilience: a qualitative study about how organisations handle trends and their effects on business models from experts' views", *International Journal of Innovation Science*, Vol. 12 No. 5, pp. 525-544.

Haefner, N. and Gassmann, O. (2023), "Generative AI and AI-based business model innovation", *Journal of Business Models*, Vol. 11 No. 3, pp. 46-50.

Hajiheydari, N., Talafidaryani, M., Khabiri, S. and Salehi, M. (2019), "Business model analytics: technically review business model research domain", *Foresight*, Vol. 21 No. 6, pp. 654-679, doi: 10.1108/fs-01-2019-0002.

He, P., Jiang, C., Xu, Z. and Shen, C. (2021), "Knowledge hiding: current research status and future research directions", *Frontiers in Psychology*, Vol. 12, 748237, doi: 10.3389/fpsyg.2021.748237.

Heubeck, T. and Meckl, R. (2022), "Antecedents to cognitive business model evaluation: a dynamic managerial capabilities perspective", *Review of Managerial Science*, Vol. 16 No. 8, pp. 2441-2466, doi: 10.1007/s11846-021-00503-7.

Hock, M., Clauss, T. and Schulz, E. (2016), "The impact of organizational culture on a firm's capability to innovate the business model", *R&D Management*, Vol. 46 No. 3, pp. 433-450, doi: 10.1111/radm.12153.

Hollebeek, L.D., Urbonavicius, S., Sigurdsson, V., Clark, M.K., Parts, O. and Rather, R.A. (2022), "Stakeholder engagement and business model innovation value", *The Service Industries Journal*, Vol. 42 Nos 1-2, pp. 42-58, doi: 10.1080/02642069.2022.2026334.

Hoskisson, R.E., Chirico, F., Zyung, J. and Gambeta, E. (2017), "Managerial risk taking: a multitheoretical review and future research agenda", *Journal of Management*, Vol. 43 No. 1, pp. 137-169, doi: 10.1177/0149206316671583.

Hossain, M. (2017), "Business model innovation: past research, current debates, and future directions", *Journal of Strategy and Management*, Vol. 10 No. 3, pp. 342-359, doi: 10.1108/jsma-01-2016-0002.

Huang, S. (2013), "When peers are not peers and don't know it: the Dunning-Kruger effect and self-fulfilling prophecy in peer-review", *Bioessays*, Vol. 35 No. 5, pp. 414-416, doi: 10.1002/bies.201200182.

Huang, T.Y., Souitaris, V. and Barsade, S.G. (2019), "Which matters more? Group fear versus hope in entrepreneurial escalation of commitment", *Strategic Management Journal*, Vol. 40 No. 11, pp. 1852-1881, doi: 10.1002/smj.3051.

Janis, I.L. (1982), *Groupthink: Psychological Studies of Policy Decisions and Fiascoes*, Houghton Mifflin, Boston, MA.

Janney, J.J. and Dess, G.G. (2006), "The risk concept for entrepreneurs reconsidered: new challenges to the conventional wisdom", *Journal of Business Venturing*, Vol. 21 No. 3, pp. 385-400, doi: 10.1016/j.jbusvent.2005.06.003.

Jones, P.E. and Roelofsma, P.H. (2000), "The potential for social contextual and group biases in team decision-making: biases, conditions and psychological mechanisms", *Ergonomics*, Vol. 43 No. 8, pp. 1129-1152, doi: 10.1080/00140130050084914.

Kahneman, D. (2012), *Thinking, Fast and Slow*, Penguin, London.

Kahneman, D. and Tversky, A. (1979), "Prospect theory: an analysis of decision under risk", *Econometrica*, Vol. 47 No. 2, pp. 263-291, doi: 10.2307/1914185.

Kanbach, D.K., Heiduk, L., Blueher, G., Schreiter, M. and Lahmann, A. (2023), "The GenAI is out of the bottle: generative artificial intelligence from a business model innovation perspective", *Review of Managerial Science*, pp. 1-32, doi: 10.1007/s11846-023-00696-z.

Karami, M., Baber, W.W. and Ojala, A. (2022), "The effectual process of business model innovation for seizing opportunities in Frontier markets", *Technovation*, Vol. 117, 102595, doi: 10.1016/j.technovation.2022.102595.

Karhu, P. and Ritala, P. (2020), "The multiple faces of tension: dualities in decision-making", *Review of Managerial Science*, Vol. 14 No. 3, pp. 485-518, doi: 10.1007/s11846-018-0298-8.

Kerr, N.L. and Tindale, R.S. (2004), "Group performance and decision making", *Annual Review of Psychology*, Vol. 55, pp. 623-655.

Klein, N. and Epley, N. (2015), "Group discussion improves lie detection", *Proceedings of the National Academy of Sciences*, Vol. 112 No. 24, pp. 7460-7465.

Kogan, N. and Wallach, M.A. (1964), *Risk Taking: A Study in Cognition and Personality*, Holt, Rinehart & Winston, New York.

Korherr, P., Kanbach, D.K., Kraus, S. and Mikalef, P. (2022), "From intuitive to data-driven decision-making in digital transformation: a framework of prevalent managerial archetypes", *Digital Business*, Vol. 2 No. 2, 100045, doi: 10.1016/j.digbus.2022.100045.

Kraus, S., Kallmuenzer, A., Kanbach, D.K., Krysta, P.M. and Steinhoff, M.M. (2023), "An integrative framework for business model innovation in the tourism industry", *The Service Industries Journal*, Vol. 43 Nos 1-2, pp. 1-23, doi: 10.1080/02642069.2022.2127690.

Krueger, N.F. Jr and Brazeal, D.V. (1994), "Entrepreneurial potential and potential entrepreneurs", *Entrepreneurship Theory and Practice*, Vol. 18 No. 3, pp. 91-104, doi: 10.1177/104225879401800307.

Kruger, J. and Dunning, D. (1999), "Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments", *Journal of Personality and Social Psychology*, Vol. 77 No. 6, pp. 1121-1134, doi: 10.1037//0022-3514.77.6.1121.

Lahno, A.M., Serra-Garcia, M., D'Exelle, B. and Verschoor, A. (2015), "Conflicting risk attitudes", *Journal of Economic Behavior and Organization*, Vol. 118, pp. 136-149, doi: 10.1016/j.jebo.2015.03.003.

Lam, S.S. and Schaubroeck, J. (2011), "Information sharing and group efficacy influences on communication and decision quality", *Asia Pacific Journal of Management*, Vol. 28 No. 3, pp. 509-528.

Laukkanen, M. and Patala, S. (2014), "Analysing barriers to sustainable business model innovations: innovation systems approach", *International Journal of Innovation Management*, Vol. 18 No. 6, 1440010, doi: 10.1142/s1363919614400106.

Leana, C.R. (1985), "A partial test of Janis' groupthink model: effects of group managerial cohesion and leader behavior on defective decision making", *Journal of Management*, Vol. 11 No. 1, pp. 5-18, doi: 10.1177/014920638501100102.

Lendowski, E., Oldeweme, A. and Schewe, G. (2022), "Drivers of innovation performance and firm performance: examining the inter-relationship of risk-taking, risk management and open innovation", *International Journal of Innovation Management*, Vol. 26 No. 2, 2250015, doi: 10.1142/s1363919622500153.

Leppäaho, T. and Ritala, P. (2022), "Surviving the coronavirus pandemic and beyond: unlocking family firms' innovation potential across crises", *Journal of Family Business Strategy*, Vol. 13 No. 1, 100440, doi: 10.1016/j.jfbs.2021.100440.

Lindgardt, Z., Reeves, M., Stalk, G. and Deimler, M.S. (2009), "Business model innovation", in *When the Game Gets Tough, Change the Game*, The Boston Consulting Group, Boston, MA, p. 118.

Lu, L., Yuan, Y.C. and McLeod, P.L. (2012), "Twenty-five years of hidden profiles in group decision making: a meta-analysis", *Personality and Social Psychology Review*, Vol. 16 No. 1, pp. 54-75, doi: 10.1177/1088868311417243.

Luan, S., Reb, J. and Gigerenzer, G. (2019), "Ecological rationality: fast-and-frugal heuristics for managerial decision making under uncertainty", *Academy of Management Journal*, Vol. 62 No. 6, pp. 1735-1759, doi: 10.5465/amj.2018.0172.

Maciejovsky, B., Sutter, M., Budescu, D.V. and Bernau, P. (2013), "Teams make you smarter: how exposure to teams improves individual decisions in probability and reasoning tasks", *Management Science*, Vol. 59 No. 6, pp. 1255-1270, doi: 10.1287/mnsc.1120.1668.

Magretta, J. (2002), "Why business models matter", *Harvard Business Review*, Vol. 80 No. 5, pp. 86-92.

Manata, B. and Bozeman, J. (2022), "Documenting the longitudinal relationship between group conflict and group Cohesion", *Communication Studies*, Vol. 73 No. 3, pp. 331-345, doi: 10.1080/10510974.2022.2058576.

Manev, I.M., Gyoshev, B.S. and Manolova, T.S. (2005), "The role of human and social capital and entrepreneurial orientation for small business performance in a transitional economy", *International Journal of Entrepreneurship and Innovation Management*, Vol. 5 Nos 3-4, pp. 298-318, doi: 10.1504/ijeim.2005.006531.

March, J.G. and Shapira, Z. (1987), "Managerial perspectives on risk and risk taking", *Management Science*, Vol. 33 No. 11, pp. 1404-1418, doi: 10.1287/mnsc.33.11.1404.

Markides, C.C. (2013), "Business model innovation: what can the ambidexterity literature teach us?", *The Academy of Management Perspectives*, Vol. 27 No. 4, pp. 313-323, doi: 10.5465/amp.2012.0172.

Martínez-Velasco, A. and Terán-Bustamante, A. (2022), "Business model innovation and decision-making for the productive sector in times of crisis", in *Business Recovery in Emerging Markets: Global Perspectives from Various Sectors*, Springer International Publishing, Cham, pp. 129-156.

Martins, L.L., Rindova, V.P. and Greenbaum, B.E. (2015), "Unlocking the hidden value of concepts: a cognitive approach to business model innovation", *Strategic Entrepreneurship Journal*, Vol. 9 No. 1, pp. 99-117, doi: 10.1002/sej.1191.

Massa, L., Tucci, C.L. and Afuah, A. (2017), "A critical assessment of business model research", *Academy of Management Annals*, Vol. 11 No. 1, pp. 73-104, doi: 10.5465/annals.2014.0072.

Matzler, K., Bailom, F. and Mooradian, T.A. (2007), "Intuitive decision making", *MIT Sloan Management Review*, Vol. 49 No. 1, p. 13.

Matzler, K., Bailom, F., von den Eichen, S.F. and Kohler, T. (2013), "Business model innovation: coffee triumphs for Nespresso", *Journal of Business Strategy*, Vol. 34 No. 2, pp. 30-37, doi: 10.1108/02756661311310431.

McCauley, C. (1989), "The nature of social influence in groupthink: compliance and internalization", *Journal of Personality and Social Psychology*, Vol. 57 No. 2, pp. 250-260, doi: 10.1037/0022-3514.57.2.250.

Meyer, B., Schermuly, C.C. and Kauffeld, S. (2016), "That's not my place: the interacting effects of faultlines, subgroup size, and social competence on social loafing behaviour in work groups", *European Journal of Work and Organizational Psychology*, Vol. 25 No. 1, pp. 31-49, doi: 10.1080/1359432x.2014.996554.

Mihelič, K.K. and Culiberg, B. (2019), "Reaping the fruits of another's labor: the role of moral meaningfulness, mindfulness, and motivation in social loafing", *Journal of Business Ethics*, Vol. 160 No. 3, pp. 713-727, doi: 10.1007/s10551-018-3933-z.

Minson, J.A., Liberman, V. and Ross, L. (2011), "Two to tango: effects of collaboration and disagreement on dyadic judgment", *Personality and Social Psychology Bulletin*, Vol. 37 No. 10, pp. 1325-1338, doi: 10.1177/0146167211410436.

Mintz, A. and Wayne, C. (2016), "The polythink syndrome and elite group decision-making", *Political Psychology*, Vol. 37 S1, pp. 3-21, doi: 10.1111/pops.12319.

Montecinos-Pearce, A., Rodrigo, P. and Duran, I.J. (2020), "When is escalation of commitment unstoppable in group settings? An iterative economic modeling approach to unveil the dark side of group decision-making", *Managerial and Decision Economics*, Vol. 41 No. 8, pp. 1387-1402, doi: 10.1002/mde.3190.

Morris, M., Schindehutte, M. and Allen, J. (2005), "The entrepreneur's business model: toward a unified perspective", *Journal of Business Research*, Vol. 58 No. 6, pp. 726-735, doi: 10.1016/j.jbusres.2003.11.001.

Mullen, B., Anthony, T., Salas, E. and Driskell, J.E. (1994), "Group managerial cohesion and quality of decision making: an integration of tests of the groupthink hypothesis", *Small Group Research*, Vol. 25 No. 2, pp. 189-204, doi: 10.1177/1046496494252003.

Nicholson, D.H., Hopthrow, T. and Randsley de Moura, G. (2022), "Gender, hidden profiles, and the individual preference effect", *Journal of Applied Social Psychology*, Vol. 52 No. 8, pp. 735-750, doi: 10.1111/jasp.12846.

Nold, H. and Michel, L. (2022), "The dunning-kruger effect on organizational agility", *Academy of Management Proceedings*, Vol. 2022 No. 1, 10365, Academy of Management, doi: 10.5465/ambpp.2022.10365abstract.

Norris, J.I., De Calvo, M.P.C. and Mather, R.D. (2020), "Managing an existential threat: how a global crisis contaminates organizational decision-making", *Management Decision*, Vol. 58 No. 10, pp. 2117-2138, doi: 10.1108/md-08-2020-1034.

Nutt, P.C. (2011), "Making decision-making research matter: some issues and remedies", *Management Research Review*, Vol. 40 No. 3, pp. 270-291, doi: 10.1108/mrr-03-2016-0054.

Osterwalder, A. (2004), "The business model ontology a proposition in a design science approach", Doctoral dissertation, Université de Lausanne, Faculté des hautes études commerciales.

Park, W.W. (2000), "A comprehensive empirical investigation of the relationships among variables of the groupthink model", *Journal of Organizational Behavior*, Vol. 21 No. 8, pp. 873-887, doi: 10.1002/1099-1379(200012)21:83.0.co;2-8.

Perkmann, M. and Spicer, A. (2010), "What are business models? Developing a theory of performative representations", in *Technology and Organization: Essays in Honour of Joan Woodward*, Emerald Group Publishing, pp. 265-275.

Rawls, J. (1971), *A Theory of Justice*, Harvard University Press, Cambridge, MA.

Reymen, I., Berends, H., Oudehand, R. and Stultiëns, R. (2017), "Decision making for business model development: a process study of effectuation and causation in new technology-based ventures", *R&D Management*, Vol. 47 No. 4, pp. 595-606, doi: 10.1111/radm.12249.

Ricart, J.E. (2023), "Business Model Innovation as the new strategy arena", *Journal of Business Models*, Vol. 11 No. 3, pp. 18-23.

Ross, L., Greene, D. and House, P. (1977), "The 'false consensus effect': an egocentric bias in social perception and attribution processes", *Journal of Experimental Social Psychology*, Vol. 13 No. 3, pp. 279-301, doi: 10.1016/0022-1031(77)90049-x.

Roth, B. and Voskort, A. (2014), "Stereotypes and false consensus: how financial professionals predict risk preferences", *Journal of Economic Behavior and Organization*, Vol. 107 Part B, pp. 553-565, doi: 10.1016/j.jebo.2014.05.006.

Saebi, T., Lien, L. and Foss, N.J. (2017), "What drives business model adaptation? The impact of opportunities, threats and strategic orientation", *Long Range Planning*, Vol. 50 No. 5, pp. 567-581, doi: 10.1016/j.lrp.2016.06.006.

Sánchez, P. and Ricart, J.E. (2010), "Business model innovation and sources of value creation in low-income markets", *European Management Review*, Vol. 7 No. 3, pp. 138-154, doi: 10.1057/emr.2010.16.

Sarasvathy, S.D. (2001), "Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency", *Academy of Management Review*, Vol. 26 No. 2, pp. 243-263, doi: 10.2307/259121.

Sarasvathy, S. and Kotha, S. (2001), "Effectuation in the management of knightian uncertainty: evidence from the RealNetworks case", *Research on Management and Entrepreneurship*, Vol. 1, pp. 1-49.

Schaltegger, S., Hansen, E.G. and Lüdeke-Freund, F. (2016), "Business models for sustainability: origins, present research, and future avenues", *Organization and Environment*, Vol. 29 No. 1, pp. 3-10, doi: 10.1177/1086026615599806.

Schneckenberg, D., Velamuri, V.K., Comberg, C. and Spieth, P. (2017), "Business model innovation and decision making: uncovering mechanisms for coping with uncertainty", *R&D Management*, Vol. 47 No. 3, pp. 404-419, doi: 10.1111/radm.12205.

Schneider, S. and Spieth, P. (2013), "Business model innovation: towards an integrated future research agenda", *International Journal of Innovation Management*, Vol. 17 No. 1, 1340001, doi: 10.1142/s136391961340001x.

Schulz-Hardt, S. and Mojzisch, A. (2012), "How to achieve synergy in group decision making: lessons to be learned from the hidden profile paradigm", *European Review of Social Psychology*, Vol. 23 No. 1, pp. 305-343, doi: 10.1080/10463283.2012.744440.

Schulz-Hardt, S., Brodbeck, F.C., Mojzisch, A., Kerschreiter, R. and Frey, D. (2006), "Group decision making in hidden profile situations: dissent as a facilitator for decision quality", *Journal of Personality and Social Psychology*, Vol. 91 No. 6, pp. 1080-1093, doi: 10.1037/0022-3514.91.6.1080.

Seo, M.G. and Barrett, L.F. (2007), "Being emotional during decision making—good or bad? An empirical investigation", *Academy of Management Journal*, Vol. 50 No. 4, pp. 923-940, doi: 10.5465/amj.2007.26279217.

Shin, J., Taylor, M.S. and Seo, M.G. (2012), "Resources for change: the relationships of organizational inducements and psychological resilience to employees' attitudes and behaviors toward organizational change", *Academy of Management Journal*, Vol. 55 No. 3, pp. 727-748, doi: 10.5465/amj.2010.0325.

Shiv, B., Loewenstein, G., Bechara, A., Damasio, H. and Damasio, A.R. (2005), "Investment behavior and the negative side of emotion", *Psychological Science*, Vol. 16 No. 6, pp. 435-439, doi: 10.1111/j.0956-7976.2005.01553.x.

Silva de Garcia, P., Oliveira, M. and Brohman, K. (2022), "Knowledge sharing, hiding and hoarding: how are they related?", *Knowledge Management Research and Practice*, Vol. 20 No. 3, pp. 339-351, doi: 10.1080/14778238.2020.1774434.

Simon, H.A. (1987), "Making management decisions: the role of intuition and emotion", *Academy of Management Perspectives*, Vol. 1 No. 1, pp. 57-64, doi: 10.5465/ame.1987.4275905.

Simon, H.A. (1993), "Strategy and organizational evolution", *Strategic Management Journal*, Vol. 14 S2, pp. 131-142, doi: 10.1002/smj.4250141011.

Sitkin, S.B. and Pablo, A.L. (1992), "Reconceptualizing the determinants of risk behavior", *Academy of Management Review*, Vol. 17 No. 1, pp. 9-38, doi: 10.5465/amr.1992.4279564.

Snihur, Y. and Eisenhardt, K.M. (2022), "Looking forward, looking back: strategic organization and the business model concept", *Strategic Organization*, Vol. 20 No. 4, pp. 757-770, doi: 10.1177/14761270221122442.

Snihur, Y., Thomas, L.D. and Burgelman, R.A. (2023), "Strategically managing the business model portfolio trajectory", *California Management Review*, Vol. 65 No. 2, pp. 156-176, doi: 10.1177/00081256221140930.

SOEP-IS Group (2019), *SOEP-IS 2017 – Questionnaire for the SOEP Innovation Sample*, SOEP Survey Paper 714, Series A – Survey Instruments, Berlin.

Sohrab, S.G., Waller, M.J. and Kaplan, S. (2015), "Exploring the hidden-profile paradigm: a literature review and analysis", *Small Group Research*, Vol. 46 No. 5, pp. 489-535, doi: 10.1177/1046496415599068.

Song, H., Hou, J., Yang, X. and Zhang, Y. (2022), "The impact of risk perception difference of members of a scientific research project team on information adoption: the moderating effect of knowledge inertia", *Sustainability*, Vol. 14 No. 13, p. 7749, doi: 10.3390/su14137749.

Spieth, P., Breitenmoser, P. and Röth, T. (2023), "Business model innovation: integrative review, framework, and agenda for future innovation management research", *Journal of Product Innovation Management*, pp. 1-28, Early View, doi: 10.1111/jpim.12704.

Stasser, G. and Titus, W. (2003), "Hidden profiles: a brief history", *Psychological Inquiry*, Vol. 14 Nos 3-4, pp. 304-313, doi: 10.1207/s15327965pli1403&4_21.

Staw, B.M., Sandelands, L.E. and Dutton, J.E. (1981), "Threat rigidity effects in organizational behavior: a multilevel analysis", *Administrative Science Quarterly*, Vol. 26 No. 4, pp. 501-524, doi: 10.2307/2392337.

Stewart, W.H. Jr and Roth, P.L. (2001), "Risk Propensity differences between entrepreneurs and managers: a meta-analytic review", *Journal of Applied Psychology*, Vol. 86 No. 1, pp. 145-153, doi: 10.1037//0021-9010.86.1.145.

Taran, Y., Boer, H. and Lindgren, P. (2013), "Incorporating enterprise risk management in the business model innovation process", *Journal of Business Models*, Vol. 1 No. 1, pp. 38-60.

Taran, Y., Goduscheit, R.C. and Boer, H. (2019), "Business model innovation–A gamble or a manageable process?", *Journal of Business Models*, Vol. 7 No. 5, pp. 90-107.

Teece, D.J. (2007), "Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28 No. 13, pp. 1319-1350, doi: 10.1002/smj.640.

Teece, D.J. (2010), "Business models, business strategy and innovation", *Long Range Planning*, Vol. 43 Nos 2-3, pp. 172-194, doi: 10.1016/j.lrp.2009.07.003.

Tetlock, P.E., Skitka, L. and Boettger, R. (1989), "Social and cognitive strategies for coping with accountability: conformity, complexity, and bolstering", *Journal of Personality and Social Psychology*, Vol. 57 No. 4, pp. 632-640, doi: 10.1037//0022-3514.57.4.632.

Torkkeli, L., Salojärvi, H., Sainio, L.M. and Saarenketo, S. (2015), "Do all roads lead to Rome? The effect of the decision-making logic on business model change", *Journal of Entrepreneurship Management and Innovation*, Vol. 11 No. 3, pp. 5-24, doi: 10.7341/20151131.

Tripsas, M. and Gavetti, G. (2000), "Capabilities, cognition, and inertia: evidence from digital imaging", *Strategic Management Journal*, Vol. 21 Nos 10-11, pp. 1147-1161, doi: 10.1002/1097-0266(200010/11)21:10/113.3.co;2-i.

Tversky, A. and Kahneman, D. (1974), "Judgment under Uncertainty: heuristics and Biases: biases in judgments reveal some heuristics of thinking under uncertainty", *Science*, Vol. 185 No. 4157, pp. 1124-1131, doi: 10.1126/science.185.4157.1124.

Tykkyläinen, S. and Ritala, P. (2021), "Business model innovation in social enterprises: an activity system perspective", *Journal of Business Research*, Vol. 125, pp. 684-697, doi: 10.1016/j.jbusres.2020.01.045.

Van Knippenberg, D. and Schippers, M.C. (2007), "Work group diversity", *Annual Review Psychology*, Vol. 58 No. 1, pp. 515-541, doi: 10.1146/annurev.psych.58.110405.085546.

Van Winsen, F., de Mey, Y., Lauwers, L., Van Passel, S., Vancauteren, M. and Wauters, E. (2016), "Determinants of risk behaviour: effects of perceived risks and risk attitude on farmer's adoption of risk management strategies", *Journal of Risk Research*, Vol. 19 No. 1, pp. 56-78, doi: 10.1080/13669877.2014.940597.

Vatankhah, S., Bamshad, V., Altinay, L. and De Vita, G. (2023), "Understanding business model development through the lens of complexity theory: enablers and barriers", *Journal of Business Research*, Vol. 155, 113350, doi: 10.1016/j.jbusres.2022.113350.

Vuori, T.O. and Huy, Q.N. (2022), "Regulating top managers' emotions during strategy making: Nokia's socially distributed approach enabling radical change from mobile phones to networks in 2007-2013", *Academy of Management Journal*, Vol. 65 No. 1, pp. 331-361, doi: 10.5465/amj.2019.0865.

Walsh, J.P. (1995), "Managerial and organizational cognition: notes from a trip down memory lane", *Organization Science*, Vol. 6 No. 3, pp. 280-321, doi: 10.1287/orsc.6.3.280.

Wang, Y., Meister, D.B. and Gray, P.H. (2013), "Social influence and knowledge management systems use: evidence from panel data", *MIS Quarterly*, Vol. 37 No. 1, pp. 299-313, doi: 10.25300/misq/2013/37.1.13.

Wang, Q., Yang, X. and Xi, W. (2018), "Effects of group arguments on rumor belief and transmission in online communities: an information cascade and group polarization perspective", *Information and Management*, Vol. 55 No. 4, pp. 441-449, doi: 10.1016/j.im.2017.10.004.

Weber, E.U., Blais, A.R. and Betz, N.E. (2002), "A domain-specific risk-attitude scale: measuring risk perceptions and risk behaviors", *Journal of Behavioral Decision Making*, Vol. 15 No. 4, pp. 263-290, doi: 10.1002/bdm.414.

Whyte, G. (1998), "Recasting Janis's groupthink model: the key role of collective efficacy in decision fiascoes", *Organizational Behavior and Human Decision Processes*, Vol. 73 Nos 2-3, pp. 185-209, doi: 10.1006/obhd.1998.2761.

Wiltbank, R., Dew, N., Read, S. and Sarasvathy, S.D. (2006), "What to do next? The case for non-predictive strategy", *Strategic Management Journal*, Vol. 27 No. 10, pp. 981-998, doi: 10.1002/smj.555.

Wirtz, B. and Daiser, P. (2018), "Business model innovation processes: a systematic literature review", *Journal of Business Models*, Vol. 6 No. 1, pp. 40-58.

Wittenbaum, G.M., Hollingshead, A.B. and Botero, I.C. (2004), "From cooperative to motivated information sharing in groups: moving beyond the hidden profile paradigm", *Communication Monographs*, Vol. 71 No. 3, pp. 286-310.

Wittig, A., Kulins, C. and Weber, C. (2017), "Toward a best practice framework in business model innovation", *IEEE Technology and Engineering Management Conference*, pp. 86-93.

Wu, W., Kou, G. and Peng, Y. (2018), "A consensus facilitation model based on experts' weights for investment strategy selection", *Journal of the Operational Research Society*, Vol. 69 No. 9, pp. 1435-1444, doi: 10.1080/01605682.2017.1398203.

Wu, W., Xu, Z. and Kou, G. (2020), "Evaluation of group decision making based on group preferences under a multi-criteria environment", *Technological and Economic Development of Economy*, Vol. 26 No. 6, pp. 1187-1212, doi: 10.3846/tede.2020.13378.

Wu, C.M., Schulz, E., Pleskac, T.J. and Speekenbrink, M. (2022), "Time pressure changes how people explore and respond to uncertainty", *Scientific Reports*, Vol. 12 No. 1, p. 4122, doi: 10.1038/s41598-022-07901-1.

Zhang, J. and Casari, M. (2012), "How groups reach agreement in risky choices: an experiment", *Economic Inquiry*, Vol. 50 No. 2, pp. 502-515, doi: 10.1111/j.1465-7295.2010.00362.x.

Zott, C. and Amit, R. (2010), "Business model design: an activity system perspective", *Long Range Planning*, Vol. 43 Nos 2-3, pp. 216-226, doi: 10.1016/j.lrp.2009.07.004.

Zott, C., Amit, R. and Massa, L. (2011), "The business model: recent developments and future research", *Journal of Management*, Vol. 37 No. 4, pp. 1019-1042, doi: 10.1177/0149206311406265.

Corresponding author
Sarah Mueller-Saegebrecht can be contacted at: sarah.mueller-saegebrecht@tu-dresden.de