Business model innovation through dynamic capabilities in small and medium enterprises – Evidence from the German Mittelstand

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A B S T R A C T

German Mittelstand firms are part of an institutional setting characterized by tightly knit relationships with internal and external stakeholders, which makes it more difficult for these firms to engage in business model innovation. The topic of how these firms have remained competitive over time has attracted growing interest from researchers. Therefore, this study investigates how dynamic capabilities can promote business model innovation for a sample of SMEs from the German Mittelstand (n = 285) and tests whether the different characteristics of these firms moderate this relationship. We find that specific dynamic capabilities are needed for the various aspects of business model innovation. Medium-sized firms profit from higher engagement with outside stakeholders, while balancing efficiency and flexibility, and small firms are advised to concentrate on revising their resource configurations. Moreover, we identify whether the innovativeness of Mittelstand firms is rooted in their individual characteristics or is a function of this institutional setting.

1. Introduction

German Mittelstand firms are part of an institutional setting characterized by tightly knit relationships with internal and external stakeholders, which makes it more difficult for these firms to engage in business model innovation (BMI). On the product market, these mostly small and medium-sized enterprises (SMEs) are part of an interwoven supplier–buyer network, in which every firm has specialized in what it does best and thus, strongly relies on the network for complementary products and services (Pahnke & Welter, 2019). The German labor market emphasizes traditional industrial training and employee protection, which lead to a less flexible workforce and possible over-investment in firm-specific human capital (Jahn, 2018). Local relationship lenders make it easier for German Mittelstand firms to access financing but become major stakeholders in the companies in that process (Decker, 2018). Additionally, Germany's industrial policy (i.e., *Mittelstandspolitik*) is largely targeted at upholding the existing industrial structures to support the established SMEs (Ebner, 2010). These multiple long-term lock-ins with internal and external stakeholders make the German Mittelstand an ideal testing ground for the role of dynamic capabilities (DC) in the BMI of SMEs. Specifically, the SMEs in the German Mittelstand do not only need to overcome the resource constraints associated with SME size but also need to actively develop

DC to overcome the persistence of this institutional setting. Therefore, we investigate how DC promote BMI for a sample of SMEs from the German Mittelstand and test whether the different characteristics of these firms (i.e., size, age, and family ownership) moderate this relationship.

A firm's business model is the root of its competitive advantage and creates value for the firm (Amit & Zott, 2012; Zott, Amit, & Massa, 2011). The ways firms create value (value creation) is that they offer their products and services to customers (value proposition and value capture), which can be viewed through the BMI lens (Chesbrough, 2007; DaSilva & Trkman, 2014; Eisenhardt & Martin, 2000; Zott & Amit, 2010). This type of innovation is different from other types, as it does not rely on products or technology but on reconfiguring existing industrial structures, customers, rules of competition, and value-chains (Mezger, 2014). This "breaking [of] the rules of the game" (Markides, 1997, p. 9) is much more difficult in a coordinated market economy (Jackson & Deeg, 2008), such as the German Mittelstand. The reconfigurations demand DC, namely the firm's ability to integrate, build, and reconfigure internal and external competences (Teece, Pisano, & Shuen, 1997). The DC approach is a promising theoretical backdrop for deepening our understanding of BMI due to the similar foundations of the two research streams. Similar to business models, DC are described as three distinct but intertwined elements. First, a firm needs the

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capability to *reflect* on the utility of existing resources; second, it must be able to *sense and seize* opportunities outside the firm (e.g., markets and buyer–supplier networks); and, finally, it needs to be able to re-combine old and integrate new resources in an efficient way (DaSilva & Trkman, 2014; Eisenhardt & Martin, 2000; Kump, Englemann, Kessler, & Schweiger, 2019; Teece, 2007, 2010, 2018).

Our results clearly show that different DC influence the respective components of the BMI for German Mittelstand SMEs in different ways. While we find no direct influence of *reflecting* the utility of existing resources on any aspect of the BMI, the *sensing and seizing* of outside opportunities leads to more innovative value creation and proposition, while a higher emphasis on *transformation* enhances the value capture of the business model. Concerning the moderating effect of the common characteristics of Mittelstand SMEs, small firms are found to be more innovative in their business models when they concentrate on the re-flection of existing resources, rather than investing in sensing and seizing or transformation. These arguments indicate that small firms should approach BMI in a fundamentally different way than larger SMEs.

The contributions of this study are threefold. First, we expand the DC-based perspective of BMI (Mezger, 2014; Weimann, Gerken, & Hülsbeck, 2020). Current research on BMI emphasizes the capabilities and resources needed for successful BMI (Achtenhagen, Melin, & Naldi, 2013; Demil & Lecocq, 2015; Doz & Kosonen, 2010; Dunford, Palmer, & Benviste, 2010; Teece, 2018). These studies conceptualize BMI as a dynamic process by identifying the various organizational capabilities and resources required to support this change, but there are still gaps in understanding the internal drivers of BMI (Foss & Saebi, 2017). Our study helps close this gap by empirically testing how distinct DC drive distinct facets of the BMI. Second, in the specific context of SMEs, this study promotes the understanding of how different SMEs benefit from different DC to leverage their BMI. These results have direct practical implications for the strategic management of SMEs. Finally, we shed light on the emerging discussion regarding the German Mittelstand. This topic has gained popularity among politicians and prominent scholars in recent years to gather the "lessons learned" (see De Massis, Audretsch, Uhlaner, & Kammerlander, 2018) for SME management and industry policy. Despite this surge in interest, our study is among the first to specifically target this population and test for the influence of different Mittelstand characteristics.

The remainder of this paper is organized as follows. In the next section, we establish the concepts of BMI and DC and their relevance for SME research. Then, we introduce the German Mittelstand as an in-stitutional setting and derive our research hypotheses. In the third section, we explain the quantitative research design, including the sampling and measuring procedures. Section four outlines the results and the last section concludes with a discussion of the key findings and their practical implications, limitations, and implications for future research.

2. Business model innovation and the dynamic capabilities of SMEs in the German Mittelstand context

2.1. Business model innovation and dynamic capabilities of SMEs

Business models are usually defined based on their components (Casadesus-Masanell & Ricart, 2010; Chesbrough & Rosenbloom, 2002; Clauß, 2016; Clauß & Hock, 2014; Demil & Lecocq, 2015; Giesen, Riddleberger, Christner, & Bell, 2010; Johnson, Christensen, & Kagermann, 2008; Morris, Schindehutte, & Allen, 2005; Osterwalder & Pigneur, 2010; Spieth & Schneider, 2016; Teece, 2010). Most frame-works comprise three main dimensions: value proposition, creation, and capture (Morris et al., 2005; Teece, 2010). *Value creation* addresses questions regarding the boundaries of the firm (Holmstrom & Roberts, 1998), such as make-or-buy decisions, investment in specific resources, or the efficiency of organizational structures (Fjeldstad & Snow, 2018;

Ritter & Lettl, 2018; Schneider & Spieth, 2013). *Value proposition* ad-dresses how a firm creates value for stakeholders such as customers, suppliers, or employees, by delivering solutions that address their needs (Chesbrough, 2010; Teece, 2010, 2017). *Value capture* answers the question of how a firm gains revenue from the combination of value creation and proposition (Spieth & Schneider, 2016; Teece, 2010, 2017). Although these components are distinct, they should not be considered separately in a business model, because business models are not successful due to any single component or the sum of its parts, but rather, due to a functioning, coordinated system (Amit & Zott, 2012; Giesen et al., 2010; Johnson et al., 2008; Zott & Amit, 2010). A BMI is not constituted by a product or service or process innovation; rather, at least one complete component (Spieth & Schneider, 2016) or even the entire system are renewed (Johnson et al., 2008). Although the origin of BMI may lie in one component of the business model, an adjustment for one component usually requires the adjustment of the other compo-nents to be successful (Spieth, Schneckenberg, & Ricart, 2014; Spieth & Schneider, 2016).

SMEs face specific challenges in their business models and innova-tion. First, they suffer from several constraints (e.g., a lack of human and financial resources for R&D and resource lock-ins) to reconfigure internal resources, which in turn create an internal barrier to *value creation* (Hadjimanolis, 2000; Parida, Westerberg, & Frishammar, 2012). Second, SMEs can compensate for the lack of internal resources and competences by using external resources through the identification and cooperation with external stakeholders (Christensen, Olesen, & Kjaer, 2005; Feranita, Kotlar, & De Massis, 2017; Parida et al., 2012). Although SMEs can obtain better comparative advantages from uti-lizing external resources than larger enterprises due to characteristics such as flat hierarchies, higher risk-taking propensity, and faster and more entrepreneurial decision making, they underinvest in creating the abilities to use these resources, which in turn prevents them from in-novating their *value proposition* (Parida et al., 2012; Van De Vrande, De Jong, Vanhaverbeke, & De Rochemont, 2009). Finally, the smallness of SMEs leads to a lack of economies of scale and low bargaining power with suppliers and customers, which thus affects their *value capture* ability (Battisti, Beynon, Pickernell, & Deakins, 2019; Martynov & Shafti, 2016; Ortega-Argilés, Vivarelli, & Voigt, 2009). At face value, these results seem to confirm the classic assumption of the linear cor-relation between resource inputs and the resulting outputs, but falls short of grasping the complexity of innovative efforts. The way re-sources are utilized through organizational structures and capabilities seems to play a more important role than resource endowment (Rosenbusch, Brinckmann, & Bausch, 2011).

DC are a promising theoretical approach to deepen our under-standing of BMI (DaSilva & Trkman, 2014; Teece, 2018). This approach addresses the fundamental question of how companies develop skills and competencies that enable them to compete and gain enduring competitive advantage. DC allow a firm to a) sense and seize oppor-tunities by monitoring and building external resources, b) reflect on the future utility of existing resources, and c) transform these opportunities into a new strategic orientation by recombining and reconfiguring old and new resources (Kump et al., 2019; Teece, 2007). There are obvious similarities between the characteristics of successful business model innovators and DC (Eisenhardt & Martin, 2000; Teece, 2010). Further, previous research has suggested a close link between the BMI level and DC within a firm (Doz & Kosonen, 2010; Teece, 2018). Generating new business model ideas requires the firm's ability to sense technological and business model opportunities across industries (Mezger, 2014). To seize such opportunities, the firm must reflect on the utility of its ex-isting resources (Kump et al., 2019). To develop business model-related new competencies and integrate complementary skills from stake-holders, a firm needs to transform both old and new resources through reconfiguration (Teece, 2007; 2018).

Research on the link between BMI and DC has mainly focused on large established companies or new entrepreneurial ventures, ignoring

SMEs (Rammer & Spielkamp, 2019; Soluk, 2018; Zahra, Sapienza, & Davidsson, 2006). This gap in the literature is puzzling, given that SMEs display unique DC that enable them to survive, gain legitimacy, and take advantage of innovation (Gärtner et al., 2017; Sapienza, Autio, George, & Zahra, 2006). On one hand, research shows that large established companies benefit from DC in developing new businesses, entering new markets, learning new skills, using resources, launching new programs to drive strategic change, and commercializing technologies (Bowman & Ambrosini, 2003; Marsh & Stock, 2003; Repenning & Sterman, 2002; Zollo & Winter, 2002). On the other hand, SMEs rely on specialized knowledge in a certain industry, product range, or geographic reach, which allow them to adapt and specialize their products, services, and innovation efforts to the markets they target (Bianchi, Campodall'orto, Frattini, & Vercesi, 2010; Freel, 2003; Hausman, 2005). Due to this high specialization degree, SMEs need to be agile enough to adapt to changing environments and maintain internal flexibility and efficient operational processes. Further, their smallness means they have less bureaucracy, maintain flat hierarchies, utilize tacit knowledge, have higher efficiency through lateral and informal communication, and have a more entrepreneurial orientation (Fiegenbaum & Karnani, 1991; Liu & Cui, 2012; Nooteboom, 1994; O'Farrell and Hitchens, 1988; Vossen, 1998). This indicates DC might be especially relevant for value creation, proposition, and capture in Mittelstand's SMEs and help them overcome their path dependency and embeddedness within the value chain.

2.2. The German Mittelstand as institutional setting

The German Mittelstand, as an institutional setting, is characterized by a specific product, labor, and financial market context. The typical Mittelstand firm is a family-owned, innovation-oriented SME (Herr & Nettekoven, 2018) and is part of an industrial cluster in a rural region (Franch Parella & Carmona Hernández, 2018). Mittelstand firms profit from local knowledge spillovers (Berlemann & Jahn, 2016), external economies of scale, and specialize in one narrow market segment (Pahnke & Welter, 2019). They thus adopt a niche market strategy, where they produce one main product—often a highly complex capital good (Lehrer & Schmid, 2015)—for a defined customer segment, which enables them to focus their activities on R&D and the manufacturing of high-quality products. The value-chains Mittelstand firms operate in are characterized by many highly specialized firms that form a network of buyers and suppliers and are ultimately suppliers for one or a few large Mittelstand firms in their respective markets. This creates long-lasting, collaborative, and social ties within these value chains.

The most prominent feature of the labor market of Mittelstand firms is the unique vocational training in Germany. Under a system of dual apprenticeship, the apprentices spend 60% of their time within the firm they work for and attend a vocational college during the rest. This system emphasized producing firm-specific human capital and thus reduces worker mobility and leads to long-lasting employment contracts (Jahn, 2018). This long-term orientation of the labor market is reinforced by the German labor law, with its emphasis on employee protection (OECD, 2013). Regarding highly qualified jobs in management and engineering, the decentralized German university system guarantees access to highly qualified graduates even in rural regions (Buenstorf, Geissler, & Krabel, 2016).

Further, the unique three-tiered German banking system is tailored towards the needs of Mittelstand firms. Unlike most other countries, Germany's financial market is not dominated by commercial banks but by regional savings and cooperative banks. These small regional banks provide long-term financial and advisory services to Mittelstand firms and actively influence their strategic choices (Decker, 2018; Deeg, 1998). This type of relationship banking can overcome the high information asymmetries that accompany the production of highly complex goods and help secure access to finance for Mittelstand firms (Lehrer & Schmid, 2015). German Mittelstand firms value their

independence and are averse to outside equity investors; instead, they make heavy use of debt financing from their local bank (Audretsch & Elston, 1997; Heimer, Hölscher, & Werner, 2008; Hommel & Schneider, 2003). However this close relationship to regional banks and debt-financing comes at a cost. These banks become major stakeholders in Mittelstand firms and base their refinancing decisions on their understanding of the firms' current business models.

Mittelstand firms emphasize continuity, independent ownership, and strong emotional investments by stakeholders (Berghoff, 2006). Concerning ownership and control, Mittelstand refers to any privately held firm owned by real persons, often members of the same family, provided that these persons exercise a minimum of decision-making control (Fama & Jensen, 1983) over the firm. Mittelstand firms are usually incumbent SMEs, that is, are older than start-ups or new technology-based firms and are presumed to be less innovative (Bergek, Berggren, Magnusson, & Hobday, 2013; Kim & Min, 2015; Welter, Baker, Audretsch, & Gartner, 2017). Although young and entrepreneurial firms usually exhibit strong emotional investment from their founders, they might lack independence (e.g., through financial investments) and are usually built on an exit strategy (i.e., lack of continuity); as such, they would not be considered Mittelstand firms. Large German multinationals such as Miele, Henkel, or BMW would self-identify as German Mittelstand firms due to their continuity and the strong emotional commitment of their owning families. In extant research, the term "Mittelstand" has been used to encompass different firm populations: SMEs focusing on size (Logue, Jarvis, Clegg, & Hermes, 2015; Werner, Schröder, & Chlosta, 2018), family firms focusing on the emotional investment of owners (De Massis et al., 2018), or continuity incentives between young entrepreneurial and mature incumbent firms (Hülsbeck, Meoli, & Vismara, 2019; Love & Roper, 2015). However, none of these features alone can exhaustively describe the Mittelstand firm. Depending on the strictness of the definition, every firm that exhibits one or more of the above-described features (size, continuity, and commitment) can be generally considered a Mittelstand firm, while the strictest possible definition would only include old family SMEs and ignore a pertinent segment of the Mittelstand firm population. In this study, we concentrate on the SMEs (proxied by the number of employees) that exhibit the qualitative features of Mittelstand firms (i.e., emphasis on continuity, proxied by firm age, and owners' strong emotional commitment, proxied by family ownership) to different degrees. To understand how SMEs from the German Mittelstand engage in BMI, we utilize the DC approach. This avenue of investigation is especially fruitful for SMEs, as the BMI is not necessarily closely linked with resource endowment but more with how capable a company is in utilizing its resources (Zott & Amit, 2010).

2.3. The link between business model innovation and dynamic capabilities in Mittelstand firms

Value creation describes how a company generates value along the value chain (Clauß, 2016), including decisions regarding which products and services are to be provided internally and which are to be acquired by external stakeholders (Achtenhagen et al., 2013). These are essentially make-or-buy decisions regarding processes, resources, and structures (Clauß & Hock, 2014). For SMEs, value creation is directly linked to resource constraints. Namely, scarce internal resources are efficiently streamlined towards the current process of value creation within the current value chain without allowing for organizational resource slack (Dasí, Iborra, & Safón, 2015). While large companies have the resource endowment to absorb failure, small companies face existential risks in such a case (Nohria & Gulati, 1996). Additionally, for Mittelstand firms, the rigid curricula of the vocational training system produce a workforce with a focus on the standardized current processes of value creation (Gessler, 2017). SMEs often lack experience with innovation projects, which leads to lower innovation capabilities and, thus, face the risk of taking on management tasks without the necessary

experience (Danneels, 2002; Galunic & Rodan, 1998; Majchrzak, Cooper, & Neece, 2004). A primary focus of innovative behavior in the absence of slack is becoming better at *reflecting* existing resources (Flatten, Greve, & Brettel, 2011; Jifri, Drnevich, & Tribble, 2016) to alleviate resource constraints in the face of economic uncertainty. This streamlining of scarce yet specific resources leads to resource lock-ins with powerful buyers and suppliers, upon which the SME becomes dependent (Alcalde-Heras, Iturrioz-Landart, & Aragon-Amonarriz, 2019). This is especially true for Mittelstand firms, as they are not only locked-in with buyers and suppliers but also with an entire network of internal and external stakeholders (e.g., employees, banks, government) within the institutional setting of the German Mittelstand (Pahnke & Welter, 2019). Overinvestment in specific resources limits the capability and competence base of a firm and thereby lowers its absorptive capacity to sense and utilize new and useful resources outside the established stakeholder relations. This process leads to organizational myopia, which hinders BMI (Kim & Kwon, 2017; Snihur & Wiklund, 2019) for Mittelstand firms.

H1a. *The better Mittelstand firms are at reflecting their existing resources, the less innovative their value creation becomes.*

Conversely, we posit that shifting the attention to potential new resources through sensing and seizing enhances value creation. As innovation usually brings risks and requires substantial financial resources (Carpenter & Petersen, 2002; Freel, 1999; Madrid-Guijarro, Garcia, & Van Auken, 2009), it can be difficult to spread risk among small portfolios (Chesbrough, 2010; Van De Vrande et al., 2009). Owing to the lack of economies of scale and scope (Nooteboom, 1994), SMEs tend to keep only a small portion of R&D in-house. Moreover, they rely on fewer human resources and must, thus, also address the lack of a broad multidisciplinary competence base (Cooper, Edgett, & Kleinschmidt, 2003; De Toni & Nassimbeni, 2003). For Mittelstand firms, this lack of human capital is aggravated by the long-termism and protectionism of the German labor market. The resulting immobility of the workforce adds to the resilience of the institutional setting but reduces the necessary knowledge flows between firms and industries (Thelen & Kume, 1999). These restricted internal resources ultimately reduce innovation capabilities. Some studies contend that SMEs have difficulties handling their own innovation processes and are thus inclined to underinvest because they do not understand how and from where to achieve the required resources and capabilities. (De Toni & Nassimbeni, 2003; Edwards, Delbridge, & Munday, 2005; Hutter, Hautz, Repke, & Matzler, 2013; Parida et al., 2012). As a result, the SMEs that are willing to utilize additional external knowledge to innovate (Fabrizio, 2009; Ferreras-Méndez, Newell, Fernandéz-Mesa, & Alegre, 2015) will be able to overcome their internal limitations. Some studies examine the empirical relationship between this absorptive capacity and innovation for SMEs (Flatten et al., 2011), concluding that the absorptive capacity positively influences innovation performance (Chen, Lin, & Chang, 2009; Moilanen, Ostbye, & Woll, 2014), product and process innovation (Murovec & Prodan, 2009), and product innovation capacity (Su, Ahlstrom, Li, & Cheng, 2013). For Mittelstand firms, their trust-based relationships with numerous stakeholders make it easier to sense new developments in markets, technologies, competition, and related fields, as long as they are willing to invest in such external knowledge acquisition (Gärtner et al., 2017; Snihur & Wiklund, 2019; Weimann et al., 2020). In light of these findings, it can be argued that the sensing and seizing activities assist the value creation aspect of BMI.

H1b. *The better Mittelstand firms are at sensing and seizing external opportunities, the more innovative their value creation becomes.*

The *value proposition* dimension defines which customers are to be reached with which range of services, via which sales channels, and how the company positions itself competitively (Clauß, 2016; Clauß & Hock, 2014; Spieth & Schneider, 2016). It focuses on the following

questions: which needs do customers have and how can the company offer a solution to these needs? This does not refer to the respective product or service, but the entire service package in which these products and services are embedded (Clauß, 2016; Morris et al., 2005). SMEs combine knowledge of a defined customer base, product range, or geographical area with flat hierarchies, informal and lateral communication with internal and external stakeholders, and more fluid structures (Fiegenbaum & Karnani, 1991; Laforet, 2012, 2013; Nooteboom, 1994; O'Farrell & Hitchens, 1988; Vossen, 1998) that put them in a unique position to adapt their value proposition. Due to their superior customer orientation and focus on highly complex goods for niche markets (Lehrer & Schmid, 2015; Pahnke & Welter, 2019), it is to be expected that Mittelstand firms find it even easier to sense and seize new opportunities to adapt their value proposition.

H2a. *The better Mittelstand firms are at sensing and seizing external opportunities, the more innovative their value proposition becomes.*

Moreover, SMEs' role as trusted and long-term vendors makes them valuable external resources for their customers and enables them to participate in upstream knowledge flows (Freel & Robson, 2017). At the same time, the ability to be a valuable external resource to their customers is likely mediated by the SMEs' absorptive capacity as a scarce internal resource (Broersma, Van Gils, & De Grip, 2016; Heavey, Simsek, & Fox, 2015). The probability that SMEs will implement external knowledge flows is lower than that of larger enterprises (Ebersberger, Marsili, Reichstein, & Salter, 2010). Regarding the extent of external cooperation, SMEs generally enter fewer strategic alliances with other firms (Narula, 2004). As Hutter et al. (2013) trace these findings back to SMEs' limited ability to reconfigure and recombine old and new resources, we argue that SMEs need to actively develop transformation capabilities to be able to recombine and reconfigure old and new resources into new value propositions (Kump et al., 2019; Teece, 2007). This is especially relevant for Mittelstand firms, with their emphasis on continuity and the strong path dependencies that result from their institutional setting (Bluhm & Martens, 2008).

H2b. *The better Mittelstand SMEs are at transforming resources, the more innovative their value proposition becomes.*

Value capture addresses the question of how a company earns money with the help of value creation and proposition. The development of a business model often begins with a deep understanding of the customer situation. According to Teece (2018), the first step would be to identify customers who have unmet needs and are willing and able to pay for a product that can address these difficulties. A successful business model provides a customer solution that supports a price high enough to cover all costs and generate a satisfactory profit. BMI involves high financial investments and entrepreneurial risk taking. However, the advantages of BMI include better market positioning, customer commitment, and increased producer rent through innovation, meaning that the barriers to market entry generally seem to outweigh the costs. The revenue sources, cost structure, and margins of the business model determine the value the company generates for its owners. On one hand, customer orientation, long-term relationships, and a focus on niche markets should give Mittelstand firms a clear strategic orientation to enforce price premiums on their customers and lead to superior rent appropriation (Lehrer & Schmid, 2015; Pahnke & Welter, 2019). On the other hand, resource lock-ins with these customers and their small size make SMEs vulnerable to the bargaining power of larger customers (Hallberg, 2018; Hu, Zhang, Li, & Sørensen, 2015). Therefore, to generate additional rents while navigating these two opposing forces, SMEs need to balance efficiency and flexibility by reconfiguring and recombining old and new resources (Eisenhardt, Furr, & Bingham, 2010; Hock, Clauss, & Schulz, 2016).

H3a. *The better Mittelstand firms are at transforming resources, the more innovative their value capture becomes.*

A. Heider, et al.

Simultaneously, Mittelstand firms facing resource lock-ins and lacking the necessary slack are thereby forced to concentrate on the exploitation of existing resources and may be confronted with rent appropriation by their customers. Although the concentration on existing resources is less expensive, it neglects the required interaction with external stakeholders (Enkel & Mezger, 2013; Snihur & Wiklund, 2019).

H3b. *The better Mittelstand firms are at reflecting their existing resources, the less innovative their value capture becomes.*

The specific characteristics of Mittelstand firms can be traced back to a few key elements that might hinder BMI and confirm the recent debate that Mittelstand firms are low-growth and low-tech (Pahnke & Welter, 2019). The relative smallness of owner-managed Mittelstand firms restricts their absorptive capacity through diseconomies of scale and restricted human capital (Fama & Jensen, 1983; Garaus et al., 2016; Proeger, 2018), which are likely to lead to underinvestment in the required DC. As these firms mature, it becomes more difficult for them to innovate their business models because they have invested in specific resources and relationships within the institutional setting of the German Mittelstand. This phenomenon is especially true for firms known for their extreme specialization, niche focus, and long-term stakeholder relationships (Berghoff, 2006; Block & Spiegel, 2011; Rosenbusch et al., 2011). Mittelstand firms that see themselves as family firms are generally characterized by owner management and transgenerational intent (De Massis et al., 2018). As such, as family owners try to preserve their firms for future generations, they become risk averse and shy away from the uncertainty of change (Chrisman, Chua, De Massis, Frattini, & Wright, 2015; Meroño-Cerdán, López-Nicolás, & Molina-Castillo, 2018). At the same time, this long-term horizon leads to path-dependency and organizational myopia (Alessandri, Mammen, & Eddleston, 2018; Miller, Le Breton-Miller, & Scholnick, 2008).

H4a-c. *The effect of dynamic capabilities on BMI in Mittelstand SMEs are negatively moderated by small firm size (H4a), age (H4b), or family ownership (H4c).*

3. Method

3.1. Sample and procedure

To test our hypotheses, we collected primary data on the SMEs from the German Mittelstand during June and July 2017. We obtained contact data for German firms from a university mailing list and the mailing lists of two German Mittelstand federations. The selection of participants was based on their expertise in innovation management (Schneckenberg, Velamuri, Comberg, & Spieth, 2017). Therefore, emails were sent directly to top and middle management to target well-informed managers regarding the firms' innovation management. In total, the survey was sent to 23,621 German firms, out of which 438 accessed the survey (an initial response rate of 1.9%). A first screening of the data led to the removal of 129 responses due to incomplete survey responses and 24 responses from large firms with more than 500 employees and up to 19000. Following the official German SME definition by IfM-Bonn (technical report), the final sample consisted of 285 respondents, including 194 small-sized (below 75 employees) and 91 medium-sized (more than 75 employees and up to 500 employees) firms. Concerning the additional features of Mittelstand SMEs, firms were 60.22 years old (*SD* = 46.21) on average and 68% were family firms. Of the respondents, 42% were key persons responsible for innovation management and 46% were involved in innovation management. Regarding industries, the R&D industry was well represented (21%). The remaining firms were information and communication (22%), building and construction (14%), and trading firms (16%). We checked for nonresponse bias by comparing early and late respondents.

The result of the *t*-test showed no significant difference across means ($p > .05$), indicating that the nonresponse bias was not a major concern.

3.2. Measurement

3.2.1. Business model innovation

The BMI variables were measured by an instrument developed and validated by Spieth and Schneider (2016). The instrument consists of nine items to be answered by respondents using a six-point Likert scale (Spieth & Schneider, 2016). At present, three content areas—value creation (four items), value proposition (three items), and value capture (two items)—are proposed to cover the scope of BMI in firms. An exploratory factor analysis with maximum likelihood and direct oblimin rotation was conducted to explore the factor structure of our sample (Schmitt, 2011). Sampling adequacy was confirmed using the Kaiser-Meyer-Olkin measure of sampling adequacy of 0.86 and a significant Bartlett's test of sphericity ($p < .001$). The results revealed the three dimensions ad satisfactory internal consistency: value creation ($\alpha = 0.85$), value proposition ($\alpha = 0.77$), and value capture ($\alpha = 0.80$).

3.2.2. Dynamic capabilities

DC are measured using a multidimensional instrument developed by Kump et al. (2019), based on Teece (2007), consisting of 19 validated items to be answered on a six-point Likert scale. We performed exploratory factor analysis to validate the questionnaire in our sample (Gerbing & Hamilton, 1996). The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO = 0.84) and Bartlett's test ($p = .000$) indicated the dataset was appropriate for further analysis. Suppressing factor loadings below 0.30, the maximum likelihood analysis with direct oblimin rotation yielded a solution with three factors and two cross-loadings; the two cross-loading items that did not load significantly on either factor were eliminated. The final instrument contained 17 items among three factors: reflection (five items, Cronbach's alpha $\alpha = 0.90$), sensing and seizing (eight items, Cronbach's alpha $\alpha = 0.89$), and transforming (four items, Cronbach's alpha $\alpha = 0.88$).

3.2.3. Control variables

In accordance with the literature, we controlled for a number of factors, including firm size, age, family firm status, and industry (Chesbrough & Rosenbloom, 2002; Zahra et al., 2006). Given the fact that definitions of what firm size constitutes an SME (EC, 2003; technical report; OECD, 2007; SBA, 2019), we created a dummy variable for firms between 251 and 500 employees. These firms constitute 8% of the sample. We grouped the industries according to the United Nations industry classification system International Standard Industrial Classification (ISIC), as research suggests that the organizational context might play a role in innovation management (Zahra, Hayton, & Salvato, 2004; Zahra et al., 2006). Additionally, Schneckenberg et al. (2017) argue that the persons responsible for BMI occupy various top and middle management positions. That is, participants involved in BMI can better assess their own BMI efforts and do not undermine their own responsibility. Due to their higher level of knowledge, they also tend to be more critical than less informed respondents. Therefore, we asked employees if they were key persons responsible for the implementation of innovation management in their firm or if they were involved in the implementation of innovation management. Table 1 shows the descriptive statistics for all variables used in this study.

3.3. Statistical analysis

Anonymized questionnaire data were transferred to Stata 14 for statistical analysis. Prior to the inferential analyses, all data were checked for plausibility. The correlations between variables are shown in Table 2. We examined our hypotheses using ordinary least squares

Table 1
Descriptive statistics.

Variable	# items	Cronbach's α	M	SD	Min	Max
Dependent variables						
Value creation	3	0.85	3.78	1.29	1	6
Value proposition	3	0.77	2.90	1.24	1	6
Value capture	2	0.80	3.14	1.28	1	6
Independent variables						
Reflection	5	0.90	4.35	1.00	1	6
Sensing and seizing	8	0.89	4.10	0.88	1.50	6
Transformation	4	0.88	3.80	1.05	1	6
Controls						
Age of the firm	1	–	60.21	46.22	2	273
Number of employees	1	–	88.90	100.92	3	500
Revenue[1]	1	–	1.98	1.27	−2.30	5.70
Revenue/employee	1	–	0.19	0.36	0.01	5.26
Family firm	1	–	0.68	0.46	0	1
Firm size: small	1	–	0.68	0.46	0	1
Firm size > 250 employees	1	–	0.08	0.27	0	1
Responsible for the innovation process	1	–	0.42	0.49	0	1
Key person responsible for the innovation process	1	–	0.46	0.49	0	1
Industry						
R&D	1	–	0.21	0.41	0	1
Suppliers	1	–	0.05	0.23	0	1
Building and construction	1	–	0.14	0.35	0	1
Retail	1	–	0.16	0.36	0	1
Information and communication	1	–	0.22	0.41	0	1
Service activities	1	–	0.06	0.24	0	1

N = 285; [1] logarithm

(OLS) regression analysis for predicting the three BMI dimensions (Table 3). Model I includes all variables. In Model II, the insignificant control variables were dropped, resulting in the final Model III. Moderation analyses (see H4) using firm size, age, and family firm as moderators were performed to examine how the relationship between DC and BMI behaves when the regression is modified by adding a regressor. The firm size, age, family firm, and DC variables were centered and multiplied to create interaction terms. Since unobserved heterogeneity may be an issue, a linktest was performed to determine if omitted variables were present. The results showed that the test failed to reject the assumption and the model is likely to be without specification error. Therefore, unobserved heterogeneity is not a concern.

4. Results

Table 2 reveals slight to moderate correlations between variables. DC and BMI are moderately correlated, ranging from 0.15 to 0.22 ($p < .05$). Several control variables are intercorrelated, but only a few correlate significantly with the dimensions of DC and BMI. Table 3 gives an overview of the regression analyses results. Although no significant effect is found in support of H1a, the negative sign implies the assumed negative correlation of engaging in reflection activities and value creation. For H1b, the results show that the sensing and seizing variable has a significant positive influence on value creation ($β = 0.56$, $p < .01$). This means that sensing opportunities in the market and being able to seize them in a way relevant for the firm's business is crucial in changing the firm's internal value creation processes as part of BMI. For value proposition, we identify its significant and positive relationship with sensing and seizing ($β = 0.28$, $p < .01$), confirming H2a. Sensing opportunities in the market seems to be an integral part of value proposition (i.e., the decision regarding which customers are reached regarding which range of services via which marketing channels are used and how the company positions itself regarding its

competitors). Therefore, sensing helps firms exploit business opportunities that have value for stakeholders (e.g., customers), while generating a profit for the firm and its partners at the same time. We find no significant evidence for the proposed relationship between transformation and value proposition in the specification models ($β = 0.32$, ns; $β = 19$; ns), although the sign of the coefficient points in the expected direction. Regarding H3a, we find that transforming capabilities are significantly and positively related to value capture ($β = 0.16$, $p < .05$). The capability to transform helps companies answer the question of how to balance efficiency and flexibility with the help of value creation and proposition to earn money. For H3b, no support was found. Reflection remains insignificant throughout the three specification models, leading to the rejection of H3a ($β = −0.07$, ns; $β = −0.06$, ns).

Considering H4, which posits that the links between BMI and DC are moderated by the three elements signifying Mittelstand SMEs (size, age, and family ownership), we find no evidence for age and family ownership, which are at the core of the Mittelstand firm definition. At the same time, we find a number of moderating effects for small firm size. The interaction term for reflection and small size positively and significantly correlates with value creation. The direction of this relationship counters H4 and indicates that small firms can leverage their value creation by focusing on internal resources. The interaction effect between sensing and seizing and small firm size negatively and significantly correlates with value creation. This finding confirms that small firms with constrained resources might lack the absorptive capacity to properly benefit from higher investment in sensing and seizing. While these effects are consistent in all models, we see another negative and significant correlation for the interaction term between transformation and small firm size with value capture. This proves that especially small firms struggle to maintain the balance between flexibility and efficiency for rent appropriation. Overall, the results cannot be explained by resource constraints in small firms alone. Instead, these constraints might be mitigated by clever resource utilization. Concerning additional control variables, the SMEs in industries under strong competitive pressure as a result of short innovation cycles (e.g., information and communication) or new technologies (e.g., e-commerce in retail) are far more advanced in their BMI efforts compared to other industries. We consider this finding as an additional plausibility check for our results. Additionally, we used other simultaneous equation estimators, that is, multiple multivariate regression and three-stage least squares regression, to control for potential method bias (not reported here). The results proved robust to these alternative specifications.

5. Discussion and conclusion

In this study, we investigate the way in which DC promote BMI for a sample of SMEs from the German Mittelstand and test whether the different characteristics of these firms (size, age, and family ownership) moderate this relationship. We find clear relationships between DC and BMI and add to the recent attempts of establishing a capability-based perspective of BMI (Mezger, 2014; Weimann et al., 2020). SMEs face unique challenges in terms of value creation due to liabilities of smallness and constrained resources (Christensen et al., 2005; Feranita et al., 2017; Hadjimanolis, 2000; Parida et al., 2012). One research stream suggests that a primary focus of innovative behavior under resource constraints is to become better at reflecting existing resources (Flatten et al., 2011; Jifri et al., 2016), while other authors find that SMEs need to invest in sensing and seizing to overcome those internal barriers (Fabrizio, 2009; Ferreras-Méndez et al., 2015) and innovate their value creation. For our sample of Mittelstand firms, we find no direct influence of reflection on BMI, while sensing and seizing significantly enhance value creation. This results is even more differentiated when looking only at small firms (interaction effect); we find that the reflection on internal resources is positively significant, while

Table 2
Correlations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1) Age of the firm																				
(2) Number of employees	0.14**																			
(3) Revenue[1]	0.34**	0.68**																		
(4) Revenue/employee	0.19**	0.01	0.42**																	
(5) Family firm	0.08	−0.17**	−0.12**	−0.10																
(6) Firm size: small	−0.25**	−0.76**	−0.63**	−0.00	0.10*															
(7) Firm size > 250 employees	0.01	0.82**	0.44**	0.00	−0.18**	−0.43**														
(8) Person involved in the innovation process	−0.02	−0.19**	−0.20**	0.01	0.05	0.17**	−0.17**													
(9) Key person responsible for the innovation process	−0.00	0.14**	0.09	−0.07	−0.06	−0.12**	0.13**	−0.79**												
(10) R&D	0.06	0.14**	0.13**	−0.03	0.04	−0.16**	0.06	−0.07	0.03											
(11) Suppliers	0.07	0.12**	0.14**	0.02	−0.17**	−0.08	0.08	−0.00	−0.02	0.01										
(12) Building and construction	0.14**	−0.04	−0.05	−0.03	0.12**	0.02	−0.01	−0.04	0.07	−0.11**	−0.06									
(13) Retail	−0.10*	0.00	0.02	−0.00	0.15**	0.05	0.01	0.05	−0.06	−0.18**	0.01	−0.07								
(14) Information and communication	−0.16**	−0.00	−0.07	0.06	−0.27**	−0.03	−0.00	−0.07	0.14**	−0.13**	−0.09*	−0.19**	−0.21**							
(15) Service activities	−0.12**	0.01	−0.04	−0.00	−0.09	−0.02	0.02	−0.02	0.00	−0.10*	−0.06	−0.10*	−0.07	−0.04						
(16) Reflection	0.12**	0.03	−0.02	−0.08	0.07	−0.02	0.02	0.08	−0.00	0.04	−0.08	−0.05	−0.01	0.08	0.07					
(17) Sensing and seizing	0.02	0.05	0.07	−0.04	−0.03	−0.00	0.02	0.00	0.05	−0.03	−0.05	−0.05	−0.00	0.10*	0.10*	0.57**				
(18) Transformation	−0.13**	0.08	0.05	−0.08	0.04	−0.08	0.04	0.09	−0.01	0.13**	−0.05	−0.09*	−0.00	0.10*	0.07	0.69**	0.52**			
(19) Value creation	−0.02	0.14**	0.09	−0.03	−0.03	−0.13**	0.11	−0.11**	0.13**	0.06	−0.04	0.00	0.05	0.16**	−0.02	0.22**	0.22**	0.21**		
(20) Value proposition	−0.00	0.00	0.04	0.05	−0.05	0.01	0.00	−0.04	0.07	0.03	0.03	−0.02	0.03	0.16**	−0.02	0.22**	0.21**	0.23**	0.44**	
(21) Value capture	0.00	0.04	−0.01	0.02	−0.00	−0.04	0.05	−0.03	0.09	−0.04	−0.03	0.01	0.11**	0.13**	−0.03	0.17**	0.12**	0.15**	0.51**	0.49**

N = 285; * p < .10; ** p < .05.
[1] logarithm.

Table 3
Moderated regression analyses for predicting BMI.

	Model I			Model II			Model III		
	Value creation	Value proposition	Value capture	Value creation	Value proposition	Value capture	Value creation	Value proposition	Value capture
Controls									
Age of the firm	−0.01 (0.00)	0.00 (0.00)	0.00 (0.00)						
Ln_Revenue	0.03 (0.10)	0.05 (0.09)	−0.07 (0.09)						
Revenue/employee	−0.15 (0.16)	0.12 (0.22)	0.19 (0.22)						
Family firm	−0.05 (0.17)	−0.05 (0.17)	−0.07 (0.17)						
Firm size: small	0.53 (0.87)	0.68 (0.83)	−0.89 (0.85)	0.59 (0.84)	0.59 (0.80)	−0.67 (0.82)			
Firm size > 250 employees	0.20 (0.26)	−0.13 (0.30)	0.12 (0.29)						
Person involved in the innovation process	−0.31 (0.27)	−0.14 (0.21)	0.07 (0.26)	−0.18 (0.27)	−0.08 (0.20)	0.18 (0.26)			
Key person responsible for the innovation process	−0.05 (0.28)	0.06 (0.20)	0.35 (0.26)	0.07 (0.27)	0.07 (0.20)	0.36 (0.25)			
Industry									
R&D	0.24 (0.19)	0.23 (0.20)	0.03 (0.20)	0.27 (0.19)	0.20 (0.20)	0.00 (0.19)			
Suppliers	−0.05 (0.35)	0.34 (0.34)	0.01 (0.28)	0.00 (0.32)	0.40 (0.32)	−0.04 (0.26)			
Building and construction	0.26 (0.22)	0.15 (0.24)	0.12 (0.28)	0.26 (0.21)	0.16 (0.23)	0.21 (0.21)			
Retail	0.49 (0.20) **	0.32 (0.24)	0.60 (0.23) ***	0.48 (0.19) **	0.29 (0.23)	0.54 (0.22) **	0.39 (0.18) **		0.52 (0.21) **
Information and communication	0.59 (0.23) **	0.52 (0.23) **	0.48 (0.24) **	0.58 (0.20) ***	0.52 (0.19) ***	0.44 (0.21) *	0.52 (0.18) ***	0.49 (0.16) ***	0.45 (0.19) **
Service activities	−0.10 (0.30)	−0.07 (0.28)	−0.13 (0.34)	−0.09 (0.29)	−0.11 (0.26)	−0.12 (0.32)			
Independent variables									
Reflection	−0.13 (0.16)	0.02 (0.18)	−0.07 (0.15)	−0.12 (0.16)	0.00 (0.18)	−0.06 (0.16)			
Sensing and seizing	0.23 (0.26)	0.16 (0.15)	0.10 (0.19)	0.47 (0.16) ***	0.25 (0.14) *	0.02 (0.18)	0.45 (0.09) ***	0.28 (0.08) ***	
Transformation	0.23 (0.16)	0.32 (0.30)	0.31 (0.13) **	0.21 (0.15)	0.19 (0.15)	0.25 (0.13) *			0.16 (0.07) **
Interactions									
Reflection * Firm size small	0.51 (0.26) *	0.12 (0.23)	0.31 (0.23)	0.42 (0.22) *	0.18 (0.21)	0.32 (0.20)	0.28 (0.11) **		
Sensing and seizing * Firm size small	−0.41 (0.23) *	−0.10 (0.23)	0.19 (0.23)	−0.43 (0.21) **	−0.09 (0.17)	0.08 (0.22)	−0.40 (0.12) ***		
Transformation * Firm size small	−0.22 (0.22)	−0.12 (0.21)	−0.38 (0.19) **	−0.24 (0.21)	−0.07 (0.20)	−0.30 (0.17) *			
Reflection * Age	0.00 (0.00)	0.00 (0.00)	−0.00 (0.00)						
Sensing and seizing * Age	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)						
Transformation * Age	0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)						
Reflection * Family firm	−0.13	−0.12	0.13						

(continued on next page)

Table 3 (continued)

	Model I			Model II			Model III		
	Value creation	Value proposition	Value capture	Value creation	Value proposition	Value capture	Value creation	Value proposition	Value capture
Sensing and seizing * Family firm	0.09 (0.28)	−0.24 (0.31)	−0.26 (0.29)						
Transformation * Family firm	0.10 (0.25)	−0.04 (0.22)	0.16 (0.24)						
Δ Adjusted R-squared	0.09	0.05	0.03	0.10	0.06	0.04	0.11	0.06	0.05
F	3.44***	2.28***	1.69**	4.61***	2.42***	2.38***	8.80***	10.69***	5.68***
N	271	271	271	285	285	285	285	285	285

$N = 285$; * $p < .10$; ** $p < .05$; *** $p < .01$. Standardized coefficients are reported. Robust standard errors are between parentheses.

sensing and seizing become negative. In comparison to medium-sized firms, small firms underutilize their capability of reflection on internal resources and resource configurations, while this effect fades for medium-sized firms as they approach the minimum efficient size. These differentiated results show that BMI needs different DC for small versus medium enterprises and that deeper investigations of the relationship between size—and probably growth—and the development of DC for BMI are needed.

Value proposition, similar to value creation, benefits from sensing and seizing as a DC. Due to characteristics such as flat hierarchies, higher risk-taking propensity, and faster and more entrepreneurial decision-making, SMEs are better off innovating their value proposition through sensing and seizing (Parida et al., 2012; Van De Vrande et al., 2009). This confirms that this is equally or even more true for Mittelstand firms due to their high customer orientation and niche market strategies. Namely, the German Mittelstand, as an institutional setting, facilitates such knowledge spillovers despite lock-in effects. Overall, sensing and seizing capabilities appear to be the main driver of BMI. The ability to capture value through BMI is limited by the smallness of the SMEs, which also leads to a lack of economies of scale and low bargaining power with suppliers and customers (Battisti et al., 2019; Martynov & Shafti, 2016; Ortega-Argilés et al., 2009). The capability to transform, protect, recombine, and reconfigure assets helps SMEs balance efficiency and flexibility to capture value. Again, this is not true when the smallness of the firm is considered. In analogy to value creation, we find a negative interaction effect with transformation. This confirms our prior assertion that different DC are relevant for SMEs of different sizes.

In addition to the capabilities-based view on BMI, our results shed light on the ongoing debate on the German Mittelstand. Recent international scholarly interest in SME and family firm research has turned to German Mittelstand firms as role models for innovation, and has identified several lessons to be learned from these firms (De Massis et al., 2018). The traits of these Mittelstand firms (e.g., long-term orientation and family management) that lower their transaction and coordination costs enable them to offset the disadvantages of SME resource constraints (Block & Spiegel, 2011; Weimann et al., 2020). These arguments have been widely used in the family firm innovation literature to explain the so-called "family firm innovation paradox" of achieving higher innovation output with comparatively lower inputs (Calabrò et al., 2019; De Massis et al., 2018). Some scholars diverge from this firm-level view and have argue that the relevant DC emerge between rather than within organizations (Gärtner et al., 2017). The German Mittelstand with its product—labor—and financial market attributes provides a unique institutional setting (Jackson & Deeg, 2008) that has been shown to be conducive to knowledge spillovers (Proeger, 2018), producing external economies of scale (Berlemann & Jahn, 2016) and re-creating close networks of buyers and suppliers (Pahnke & Welter, 2019).

In contrast to previous studies (e.g., Werner et al., 2018), we find no evidence for a positive or negative influence of long-term orientation or family management. This might stem from our focus on BMI or be due to our more fine-grained analysis of the foundations of innovative behavior. As such, we question whether these individual firms are really more innovative than other SMEs or whether their innovation advantage might be rooted in the institutional setting.

Being an empirical study, our analysis is subject to several limitations. Regarding the questionnaire, it would have been useful to collect additional demographic controls for respondents (e.g., age or job tenure), as well as more differentiated controls for firms (e.g., ownership structure) or industry specifics. We did not include a large number of such controls to enhance response probability and lower the non-response and attrition rates. Sending out a large online survey always bears the risk that researchers have no control over whether the respondents are competent and accountable to answer those questions for their respective firms. We tried to alleviate accountability by sending

out personalized emails directly to the firms' top management, while employing control variables for the respondents' competence (i.e., involvement in innovation management). A second consideration in the non-experimental questionnaires is the self-selection of respondents, which might lead to response bias. However, we compared the characteristics of early and late respondents and were not able to find evidence of response bias. A third possible methodical flaw is common method bias, especially as the dependent and independent variables were collected from the same respondents. Tests for variance inflation factors did not yield concerning results. A final methodological issue is that cross-sectional data have limited explanatory power and causation cannot be directly inferred from the data; however, because our results are based on the well-researched and widely accepted theoretical DC approach, we feel confident that at least some inferences can be drawn from our results. While our research interest in German Mittelstand firms is a main contribution of this study, this focus might limit the generalizability of the results, as these firms are influenced by the national governance and unique features of the German economy (e.g., the dominance of certain industries). Nevertheless, we are confident that researchers and practitioners can utilize these results to understand and imitate the phenomenon of the German Mittelstand.

As our study provides a first glance into the black box of DC as drivers of BMI for Mittelstand firms, further research is required to fully uncover the intricate relationships we have identified here. First, it would be interesting to further deconstruct the connection of BMI with DC by combining the microfoundations of both approaches using qualitative and quantitative studies. Second, our results show SMEs are not created alike and DC differ. In future studies, it might not thus be sufficient to relate to Mittelstand firms in general. Finally, it would be useful to construct multi-country studies on this topic, as it remains unclear how national governance regimes, innovation systems, and cultures influence SMEs' DC and their resulting abilities to engage in BMI.

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