The impact of knowledge management on relationship between entrepreneurial orientation and firm performance

Abstract

Purpose – This study investigates the impact of entrepreneurial orientation (EO) and knowledge management (KM) on firm performance (PERF), as well as the mediating role of KM to the EO-performance relationship. In particular, this study aims to explain the impact of KM on the relationship between EO dimensions and firm performance; dimensions are risk-taking (RT), innovativeness (IN), and proactiveness (PR).

Methodology – This study employs Structural Equation Modelling (SEM) and fuzzy-set Qualitative Comparative Analysis (fsQCA) methodologies to explore target relationships. The sample consists of 150 small furniture manufacturers operating in Poland (out of 1480 in the population).

Findings – The study findings show that KM partially mediates the IN-PERF relationship. Furthermore, fsQCA reveals that KM accompanied by IN is a core condition that leads to PERF. Moreover, the absence of KM (accompanied by the absence of R and IN) leads to the absence of PERF. Additionally, the results show that all the variables examined (R, IN, PR, KM) positively impact PERF.

Originality – This study explores the role of KM in the context of EO and its impact on PERF in the low-tech industry. The study uses concurrently two methodologies that represent different approaches in the search for the expected relationships. The findings reveal that KM mediates the EO-PERF relationship.

Keywords: Knowledge management, Risk-taking, Innovativeness, Proactiveness, Small and medium-sized enterprises, PLS-SEM and fsQCA

Paper type: Research paper

Highlights:

— R, IN, PR, KM positively impact PERF

— KM partially mediates the IN-PERF relationship

— KM accompanied by IN leads to PERF

— Absence of KM (accompanied by absence of R or IN) leads to absence of PERF

1. Introduction

Ajzen (1985) introduced the Theory of Planned Behaviour (TPB) as an extension of the Theory of Reasoned Action (TRA), aiming to broaden its scope to situations where behaviour is not entirely under conscious control (Chatzisarantis & Biddle, 1998). TPB proposes that behaviour is predicted by behavioural intention, which is, in turn, predicted by three base components: attitudes toward behaviour, subjective norms regarding behavior, and perceived control over the behavior (Sussman & Gifford, 2019). Knowledge sharing is a crucial aspect of enterprise knowledge management, as it enables the development and utilisation of knowledge-related resources to attain organisational objectives (Wu et al., 2022). The intention to engage in knowledge sharing is influenced by attitudes toward knowledge sharing, perceived social norms, and job autonomy. Additionally, job autonomy plays a moderating role in the relationship between perceived social norms and knowledge-sharing intentions. Specifically, job autonomy positively moderates the impact of pro-sharing norms on knowledge-sharing intentions, while it negatively moderates the effects of subjective norms on knowledge-sharing intentions. In summary, attitudes, social norms, and job autonomy collectively shape individuals' willingness to share knowledge within an organisation. In the context of TPB, research engagement is incorporated as an outcome of knowledge sharing (KS) behaviour (Ravindran & Iyer, 2014). Organisations often utilise knowledge management systems (KMS) to effectively leverage their knowledge resources, with a central component being the knowledge repository. Successful utilisation of the knowledge repository relies heavily on knowledge workers who are responsible for contributing to the knowledge base and using the available knowledge objects.

In a changing and competitive market, entrepreneurship is a necessary attribute of an organisation. According to Miller (1983), a company can only be described as entrepreneurial if it thrives on traditional characteristics such as creativity, proactivity, and risk-taking. This perspective was extended by Lumpkin and Dess (1996), who added further dimensions: competitive aggressiveness and autonomy. These characteristics constitute the concept of entrepreneurial orientation (EO). Researchers commonly use the concept of EO to study or understand a company’s entrepreneurial behaviour. Gupta and Gupta (2015) define EO as the propensity to act autonomously and innovatively, to take risks, and to be proactive under appropriate market conditions. According to Rauch et al. (2009), EO refers to basic concepts and standard operating procedures. EO can be defined as the many methods of developing strategic initiatives that key decision-makers use to achieve the overall goal of the company. This study follows Miller’s (1983) approach and examines risk-taking, innovativeness, and

proactiveness as dimensions of EO. In particular, this study addresses the problem of the relationship between EO and firm performance. Andersen (2009) argued that the relationship is complex and not obvious. In light of previous studies, this relationship is ambiguous. Numerous studies prove that the relationship between EO and performance is positive (Lumpkin & Dess, 1996; Dess et al., 1997; Wiklund & Shephard, 2005; Roxas, 2009; Lechner & Gudmundsson, 2012). However, Rauch et al. (2009) showed that the correlation between EO and performance is moderately high, and that the relationship is robust to different operationalisation of key constructs as well as to cultural contexts. Dimensions of EO (namely, innovativeness, risk-taking, and proactiveness) are likely to influence company performance in combination rather than in isolation (Huang et al., 2023). Lomberg et al. (2017) argue that the EO-firm performance relationship is context-dependent. In this vein, Irwin et al. (2018) posit that strategic human capital moderates the relationship between EO and SME performance. Other studies suggest that the correlation between EO and organisational effectiveness is low or insignificant (Andersen, 2009; Renko et al., 2009). Furthermore, the results of Kurtulmuş and Warner (2015) showed that EO activities did not provide better financial performance in SMEs. Finally, there are studies which show mixed or non-linear relationships between EO and organisational performance (Wales et al., 2013). This difference in results is explained by D'Souza and Fan (2022), who showed a negative and curvilinear relationship between EO and organisational performance for emerging organisations and a positive and curvilinear relationship for post-emergent organisations. The EO-performance relationship has also been studied in SMEs. Sidek and Mohd Rosli (2021) find that access to external finance partially mediates the relationship between EO and small firm performance, while Isichei et al. (2020) show that innovativeness and proactiveness, as dimensions of EO, have a significant impact on performance in SMEs. Ambiguous evidence regarding the relationship between EO and organisational performance suggests that this topic requires further research (Wales, 2016). In particular, factors that can mediate or moderate the EO-performance relationship need to be investigated; one of them is knowledge management (Real et al., 2014).

Knowledge is also perceived as a valuable organisational resource (Alavi & Leidner, 2001). Knowledge has traditionally been considered a broad and abstract concept. It is important to note that knowledge and knowledge management (KM) are intricate and multifaceted concepts. The field of KM has made significant strides since its inception, particularly focussing on two crucial dimensions of knowledge: the tacit and explicit aspects (Nonaka & Takeuchi, 1995; Iqbal, 2017). These dimensions are considered fundamental components of an effective knowledge management system. Although explicit knowledge can be readily accessed and

shared within an organisation, capturing and documenting tacit knowledge presents more challenges.

In recent decades, KM has emerged as a significant field within the broader discipline of Information Systems (Land, 2009). Its significance stems from the recognition that we now reside in a knowledge society, where knowledge has become a vital element for organisational competitiveness. This growing interest in organisational knowledge and KM has led to the emergence of a class of information systems known as knowledge management systems (KMS). The role of IT in supporting the codification of explicit knowledge is well-established and widely acknowledged (Alavi & Leidner, 2001). However, the role of IT in supporting tacit knowledge or potentially replacing it is less explored and discussed (Natek & Lesjak, 2021). Effective management of knowledge creation and sharing has emerged as a critical source of competitive advantage for organisations, as knowledge assets empower them to outperform their competitors (Lee, 2016). Creating knowledge plays a pivotal role in the economic development of nations, as the progress in technological innovation hinges on the effective management of knowledge (García-Hurtado et al., 2022). Knowledge sharing encompasses both codified information and informal feedback, as highlighted by Magni (Magni et al., 2023). Over the past decade, there has been an exponential evolution in innovation, knowledge, and their management within organizations (Saura & Reyes-Menendez, 2021). Consequently, a plethora of companies today prioritize the acquisition of new data to extract insights that can enhance their products and services. The effective management of tacit knowledge is a cornerstone for elevating the service quality of enterprises (Zhang et al., 2021; Zhu & Zhang, 2010). Enhancing knowledge management capabilities can facilitate the implementation of human resource management systems (Zhuo, 2017). The positive and negative implications of innovations are a topic of rigorous debate among scholars in the field of innovation management. For instance, there is an ongoing discussion on how innovation can align with sustainability, even as concerns about job disparities resulting from automation underscore the importance of upholding human rights (Del Giudice et al., 2023). However, the literature on innovation management is still far from exhaustive in its exploration of the intersection of automation, human rights, and sustainable innovations within the context of international new ventures (INVs). In the face of intense competition, innovation has been recognised as a key solution to the challenges encountered by companies operating in such environments; to foster innovation within organisations, effective utilization of knowledge management and intellectual capital is crucial (Yu et al., 2022). Additionally, changing market environment

requires companies to act entrepreneurially, in particular, to pursue opportunities effectively; the success of this pursuit is determined by the knowledge of the company.

Some research indicates that KM impacts entrepreneurship at the organisational level. For example, knowledge management capacity and ambidexterity capability influence entrepreneurial creativity and promotion of entrepreneurial intensity. Consequently, by developing knowledge management capability and fostering entrepreneurial creativity, a firm can achieve ambidextrous innovation, ultimately enhancing its entrepreneurial intensity and overall performance (Mokhtarzadedeh et al., 2022). Entrepreneurial knowledge impacts antecedents of entrepreneurial intentions (Liao et al., 2022). Furthermore, the KM orientation has a positive and significant effect on ambidextrous entrepreneurial innovation and overall firm performance, particularly when the firm possesses strong dynamic capabilities (Latif et al., 2021). Advances in technology have led to the adaptation of business models to the connected era (Sanchez-Robles et al., 2023). The new era of digitalization has brought with it new challenges, concerns and opportunities, provoking new reflection on the digitalization of management (Scuotto et al., 2023). Market-oriented culture mediates the relationships of top management team (TMT)-shared leadership and firm innovation capability (Singh et al., 2022). Similarly, firm innovation capability mediates the influence of market-oriented culture and firm performance, and the influence of TMT-shared leadership and firm performance. Sustainable human resource management (SHRM) views employees as a very important resource for the organisation, while paying close attention to their preferences, needs, and perspectives (Sypniewska et al., 2023). What has been called the war for talent in companies has become a key element in organizations that want to be competitive. The application of good talent management must be complemented with adequate compensation systems in order to achieve efficient retention strategies for talented employees (Luna-Arocas et al., 2020). Talent management has already been studied and verified in terms of its impact on performance and productivity, and this has led to more and more research generating a professional and scientific interest with other variables, such as ethical behaviour (Luna-Arocas & Danvila-del-Valle, 2022). Talent management and ethical behaviour would reinforce work environments, by restoring confidence in the organization. Likewise, talent management implies greater loyalty of talent, that is an antecedent of the intention to stay in the organization. Organizational ecosystems face individual, organizational, and contextual challenges, which have a major impact on talent management (TM). Talent management performance is not determined by a single condition. Instead, it results from the combination of several factors (Nieto-Aleman et al., 2023). In the rapidly changing market environment, innovative work behaviour plays an

important role in improving small and medium enterprises' (SMEs) efficiency and competitiveness (Yousaf & Palazzo, 2023). The digital transformation of companies involves a set of substantial changes in all areas of the organization. Talent management can be analysed from the perspective of the variables that attract and retain talent, with the organizational changes caused by digital transformation being an influence on talent management and the attraction and retention of talent (Guerra et al., 2023). In order for knowledge-intensive entrepreneurial firms to thrive, they must effectively leverage their knowledge resources to gain a competitive edge; this requires a combination of entrepreneurial orientation (EO) and knowledge management (KM) processes, including knowledge acquisition, application, conversion, and protection (Mostafiz et al., 2023). By cultivating an entrepreneurial mindset and implementing effective knowledge management practises, these firms can harness their knowledge assets to drive innovation, improve performance, and secure a sustainable competitive advantage.

There exists a notable correlation and influence between knowledge management models and entrepreneurial organisations, mediated by strategic entrepreneurship (Bhardwaj, 2019). When knowledge management models align with the demands, expectations, and perceptions of customers, it allows entrepreneurs to develop proactive knowledge management strategies. This, in turn, enhances strategic entrepreneurship within the organisation (Alhamdi, 2022). By improving strategic entrepreneurship, entrepreneurs can better design and implement effective knowledge management models that drive innovation, responsiveness, and overall organisational performance. EO and knowledge creation influence company performance (Elidjen et al., 2022). In the context of family firms, the effective combination of strategic knowledge management (SKM) capability and EO is a condition of their success (Mostafiz et al., 2021).

Despite the associations mentioned above, the relationships between EO, KM, and firm performance are not fully explained. Previous research provides evidence of ambiguous relationships among these factors. Some studies show that knowledge-related factors can affect the relationship between EO and performance (e.g., Matsuno et al., 2002; Adam et al., 2022). However, there is evidence that EO-related factors can also impact the relationship between KM and firm performance. For example, EO partially mediates the relationship between knowledge management and performance. (Abu Bakar et al., 2014) and the relationship between knowledge management processes, intellectual capital, and innovation (Yu et al., 2022). Additionally, factors associated with EO, such as innovation quality, are found to mediate the relationship between customer knowledge management and firm performance

(Chaithanapat et al., 2022). Furthermore, competitive intensity moderates the relationship between customer knowledge management and innovation quality (Chaithanapat et al., 2022). Additionally, EO can act as a moderator in the relationship between knowledge application and performance, positively influencing their connection (Ha et al., 2021). Moreover, EO moderates the relationship between intrafirm knowledge sharing and knowledge application (Li et al., 2009).

In response to the ambiguity mentioned above, this study investigates the role of knowledge management (KM) in the context of entrepreneurial orientation (EO) and its impact on firm performance. This study aims to explain the impact of KM on the relationships between the dimensions of EO and firm performance; examined dimensions are risk-taking (RT), innovativeness (IN), and proactiveness (PR).

This study employs PLS-SEM and fsQCA methodologies to explore the above relationships. The sample comprises 150 small furniture manufacturers operating in Poland. This study intends to contribute to the entrepreneurship and KM by deepening our understanding of the role of KM in the EO context.

The remainder of the article presents the theoretical background, methodology, results of the PLS-SEM and fsQCA examination, discussion with the previous literature, the limitations and recommendations for future research, and final conclusions.

2. Theoretical background

2.1. Entrepreneurial orientation and performance

As stated in the Introduction, EO is believed to have an impact on firm performance; however, this impact is ambiguous. Moreover, EO is a multidimensional construct, and the impact of its particular dimensions can be different. Consequently, this study examines separately the impact of three dimensions of EO, namely risk-taking, innovativeness, and proactiveness. Furthermore, previous studies show that the impact of EO and its dimension vary depending on the type of outcome (e.g., financial performance, firm growth, firm competitiveness).

One of the dimensions of EO is risk-taking. Risk-taking is defined as the propensity to engage in risky and costly activities (Schillo, 2014) rather than those that are prudent and cautious (Edwards et al., 2014). Risk-taking reflects the subjective probability of systemic failure or possible loss but is also understood as a personality trait that influences attitudes towards entrepreneurship (Al-Mamary & Alshallaqi, 2022). Bluhm and Krahnen (2014) argue that every financial decision is associated with risk. Risk-taking is believed to have a positive effect on entrepreneurial intention (Al-Mamary et al., 2020; Moraes et al., 2018; So et al., 2017);

however, some researchers argue that the ability to take risks does not affect entrepreneurial intention (Koe, 2016). Al-Mamary and Alshallaqi (2022) show that an important motivator for risk-taking is the desire to perform better than the competition.

Risk-taking propensity has been studied in various contexts, e.g., training in business attitudes for students (Al-Mamary and Alshallaqi, 2022; Koe, 2016) or market condition variables, where Al-Nashmi (2017) showed that entrepreneurs are more likely to take risks when there are changes in the market. In corporations, risk-taking is critical to a company's performance and long-term survival (Sanders & Hambrick, 2007) and is dependent on the life cycle of the organization; it is higher in the introduction and decline stages and lower in the maturity and growth stages (Shahzad et al., 2019).

Despite numerous studies on the relationship between risk-taking and firm performance, there are no clear results in this area. For example, Ghotnian et al. (2012) found that there is a correlation between risk-taking and firm performance, and González et al. (2021) reported the moderating effects of contextual factors (particularly industry, market, country institutional development, and innovativeness) on the relationship between risk orientation and financial performance. However, Naldi et al. (2007) found that risk-taking has a negligible correlation with performance; in some contexts, risk-taking increases performance, but not in others. Therefore, we hypothesise the following.

H1: Risk-taking positively impacts firm performance.

The next dimension of EO, namely, innovativeness refers to the adoption and/or implementation of something 'new' (Urban & Matela 2022). Innovation is also defined as ‘the ability to transform knowledge into value through the implementation of new or improved products, processes and systems’ (Kalotra, 2014, p. 81) It involves some kind of measurement contingent on a firm's propensity to innovate (Urban, 2012). A company is considered innovative when it adopts innovations; the degree of innovativeness is commonly defined as the number of innovations adopted over a certain period of time and can be measured in various ways, e.g., number of innovative procedures, creative ideas and first-to-market introduction of new products and services or the frequency with which new ideas are introduced (Calantone et al., 2002).

Innovativeness is one of the key conditions of performance and competitive advantage of a company (Burns & Stalker, 1961; Porter, 1990; Hult et al., 2004; Prahalad & Krishnan, 2008; Li et al., 2023) and can determine its future success and survival (Lintukangas et al., 2019). Additionally, suppliers’ innovativeness is positively related to buyer production performance

(Azadegan & Dooley, 2010) and corporate sustainability (Gualandris & Kalchschmidt, 2014); in particular, the ability to exploit innovation opportunities can lead to better sustainability (Teece, 2007, 2012). It is worth noting that environmental innovations have a positive impact on all measured company performance, while social innovations had mixed effects (Hermundsdottir, Aspelund, 2022); according to Rezende et al. (2019), results are mixed due to the time lag between innovation adoption and economic performance. There are also ambiguities regarding the impact of innovation on financial performance (Martínez-Ferrero & Frías-Aceituno, 2015; Patari et al., 2012); in particular, there is no clear answer as to whether firms that adopt innovation perform better or whether financially successful firms implement more innovation, including sustainability. The above considerations have led us to hypothesise as follows.

H2: Innovativeness positively impacts firm performance.

Proactiveness is the next commonly recognised dimension of EO. Wales et al. (2019) posit that proactivity is a central dimension of EO, as it defines the future of the firm, and is strongly related to search and exploration strategies. Proactiveness refers to seeking opportunities, forward-looking perspective and anticipation of future demand, and readiness to compete (Rauch et al., 2009; Venkatraman, 1989; Covin & Slevin, 1991). According to Lumpkin and Dess (1996), proactiveness is the conceptual opposite of passiveness. Proactiveness affects firm performance (e.g., Lumpkin & Dess, 1996; Rauch et al., 2009), also in SMEs (Tang et al., 2014), where proactive entrepreneurial behaviour positively affects SME performance (Liem et al., 2019). Lomberg et al. (2017) observed that proactiveness can have a dominant impact (compared with other dimensions of EO) in low-tech SMEs. However, Rosenbusch et al. (2013, p. 649) posit that small firms should „avoid proactive and risk-taking strategies in hostile environments" due to resource limitations. In the hospitality and tourism industry, companies showing proactive orientation to the external environment, are better able to anticipate customer needs, and are more successful in bringing new products to market (Hurtado-Palomino et al., 2022). Based on the above, we hypothesise as follows.

H3: Proactiveness positively impacts firm performance.

2.2. Entrepreneurial orientation and knowledge management

Entrepreneurial firms are constantly seeking access to knowledge (Keh et al., 2007; Boso et al., 2013; Chen & Liu, 2020) because according to the EO strategy, the search for new information helps to create more value for customers and to be proactive (Keh et al., 2007; Cheng &

Huizingh, 2014). EO and its dimensions can also impact other characteristics of a company. For example, previous research provides evidence that dimensions of EO affect positively firm digitalisation (Kusa et al., 2023). Similarly, there is evidence regarding a positive association between EO and KM (Iqbal & Malik, 2019), including a positive impact of EO on KM (Adam et al., 2022). More specific analyses show that the success of family firms is based on an effective strategic knowledge management capability (SKM) in conjunction with an EO (Mostafiz et al., 2021). Furthermore, both risk-taking and proactiveness of EO show a significant relationship with KM processes, while innovativeness of EO is not found to be significant. (Nasution et al., 2021). Furthermore, EO acts as a moderator in the relationship between knowledge application and performance, positively influencing their connection (Ha et al., 2021). Thus, we propose the following hypotheses:

H4: Risk-taking positively impacts knowledge management.

H5: Innovativeness positively impacts knowledge management.

H6: Proactiveness positively impacts knowledge management.

2.3. Knowledge management and performance

Knowledge management (KM) is an essential process for acquiring, converting, applying, and protecting knowledge assets, which play a vital role in value creation. Most of the dimensions of KM, namely knowledge acquisition, knowledge conversion, and knowledge protection, have a positive association with firm performance (Ha et al., 2021). Additionally, there is a significant impact of KM on organisational performance in the manufacturing industry (Latif et al., 2021; Mbaidin, 2022). As innovation positively influences firm performance, firms that are able to effectively exploit their knowledge and generate innovative outcomes are more likely to achieve better performance outcomes (Roxas et al., 2014). In this regard, the positive impact of knowledge acquisition on product innovativeness is relevant (Presutti et al., 2022). Effective utilisation of KMP can compensate for lower levels and maximise the benefits of intellectual capital in terms of innovation performance (Hussinki et al., 2017). Currently, information technologies facilitate the impact of KM. For example, big data analytics (BDA) helps to improve firm performance through the management and integration of knowledge (Ferraris et al., 2019). The impact of KM capacity on firm performance can be indirect and can be mediated, for example, through a sequential process involving strategic HRM, administrative innovation, and technical innovation (Chawla et al., 2022).

The application of knowledge has the strongest explanatory power for performance, regardless of whether the company is medium-sized or large (Adaileh et al., 2020). Therefore, a significant

relationship between KM and performance is observed in SMEs (Abu Bakar et al., 2014). By enhancing knowledge absorption and knowledge exploitation processes, small firms can increase their productivity (Keh et al., 2007; Chen et al., 2012; Seo & Park, 2022), foster innovation capabilities (Gassmann & Enkel, 2004), and ultimately achieve better performance outcomes (Elidjen et al., 2022; Mokhtarzadedeh et al., 2022). Externally sourced knowledge enables the identification and exploitation of opportunities (Foss et al., 2013; Tang et al., 2012; Chen & Liu, 2020). KM is found to be positively and significantly related to the engagement of SMEs in sustainable development practises (Iqbal & Malik, 2019). Additionally, there are relationships between customer knowledge management, knowledge-orientated leadership, innovation quality, and firm performance in SMEs (Chaithanapat et al., 2022). Thus, we propose the following hypotheses.

H7: Knowledge management positively impacts firm performance.

2.4. Mediating role of knowledge management in the EO-performance relationship

As noted previously, the relationship between EO and performance is ambiguous, and researchers suggest that it may be affected by other factors. As shown in the previous sub-chapters, KM can impact firm performance, but concurrently, KM can be affected by EO. This suggests that KM can play a role in the EO-performance relationship. Previous studies show that the role of KM can vary. For example, customer knowledge management acts as a mediator in the relationship between knowledge-orientated leadership and innovation quality (Chaithanapat et al., 2022). KM can mediate the relationship between talent management and organisational performance (Bagorogoza & Nakasule, 2022). KM processes were found to partially mediate the relationship between high-performance work systems and intrapreneurial behaviour (Portalanza-Chavarría & Revuelto-Taboada, 2023). Additionally, particular dimensions of KM can play a moderating role, also in relationships among other EO dimensions. For example, knowledge application mediates the positive association between intra-firm knowledge sharing and a firm's innovation (Li et al., 2009). However, KM can affect particular dimensions of EO in different ways. For example, studies on SMEs in Indonesia show that KM processes mediate the relationship between risk-taking and proactiveness and e-commerce adoption but does not significantly mediate the relationship between innovativeness and e-commerce adoption (Nasution et al., 2021). Additionally, there are significant positive correlations between autonomy and active competition (which are also recognised as components of EO) and customer knowledge management competence, as well as its process management and environment-supporting competences (Li et al., 2013). Finally, the analysis of

indirect effects reveals that relationships between EO and firm performance can be mediated by the knowledge creation process (Simsek & Heavey, 2011; Li et al., 2008; Chen et al., 2012; Karami & Tang, 2019), the acquisition and use of market information (Matsuno et al., 2002; Chen et al., 2012; Keh et al., 2007) as well as the knowledge management process (Adam et al., 2022). The above indications encourage us to propose the following hypotheses.

H8: Knowledge management mediates the impact of risk-taking on firm performance.

H9: Knowledge management mediates the impact of innovativeness on firm performance.

H10: Knowledge management mediates the impact of proactiveness on firm performance.

2.5. Theoretical model

The hypotheses proposed above are presented in Figure 1.

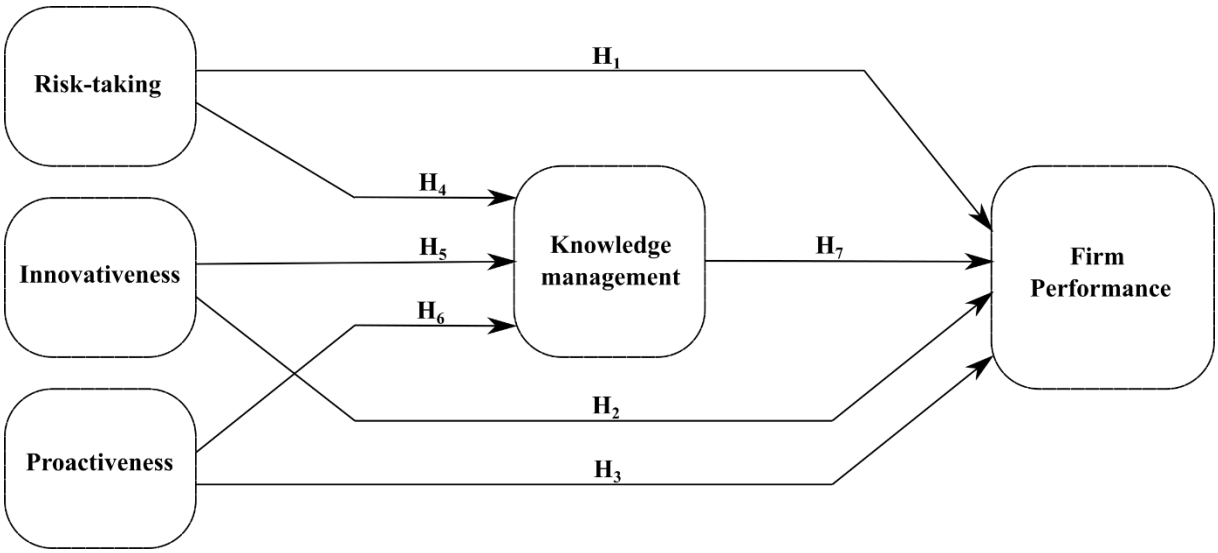

Figure 1. Theoretical model

3. Methodology

3.1. Sample and data collection procedure

The sample of this study consists of small and medium-sized furniture manufacturing enterprises in Poland. The size of the surveyed population was determined on the basis of the BNF database (www.bnf.pl), which shows that in July 2022 there were 1,480 companies that met the accepted criteria. Before the survey, the questionnaire was prevalidated during

interviews with five owners of companies in the Małopolska region conducted in June-July 2022, and then revised accordingly. Then, data was collected by interviewers using the questionnaire (PAPI) between August and October 2022. The respondents were owners or top managers of the companies surveyed. A positive response was received from 150 entities that constituted the research sample. Using G*Power 3.1.9.7 software (Faul et al., 2007), it was determined that the statistical power of the sample was 0.986; this value was higher than the required 0.8, indicating the acceptable statistical power of the analysed sample (Cohen, 1988). Table 2 shows the basic characteristics of the research sample.

Table 2. Sample characteristics

Variable	Range	Percentage
Firm age	0–10	27.30%
	10–20	33.40%
	20–30	27.30%
	Over 30	12.00%
Firm size	small	88.70%
	medium	11.30%
Family enterprise	yes	66.70%
	no	33.30%
Member of formal local network	yes	18.70%
	no	81.30%
Active in industrial cluster	yes	24.70%
	no	75.30%

3.2. Variables

The independent variables are risk-taking (R), innovativeness (IN), proactiveness (PR), and knowledge management (KM). They are constructs consisting of 3-4 items. The constructs of R, IN, and PR are based on previous studies (Hughes & Morgan, 2007; Kusa et al., 2021). The construct of KM is a new one; it was inspired by previous analyses on information management (Kettinger et al., 2021) and knowledge management (Mao et al., 2016; Acar et al., 2017). The dependent variable is the firm performance. It is a second-order construct that reflects firm competitiveness (FC), firm growth (FG), and firm financial performance (FP). All these sub-variables are four-item constructs. They are based on previous studies (Hughes & Morgan, 2007; Kusa et al., 2021). They have been measured with a seven-degree Likert's scale, where 1 stands for 'fully disagree' and 7 – 'fully agree'. The indicators used to build the constructs along with their basic statistical measures are listed in Appendix 1.

3.3. Methods

This study employs Structural Equation Modelling (SEM) and fuzzy-set Qualitative Comparative Analysis (fsQCA) methodologies to explore target relationships. In recent years, these methods have been one of the basic statistical tools in the analysis of cause-and-effect relationships in the field of entrepreneurship research (Palacios-Marques et al., 2017; Kraus et al., 2018; Ciucio et al., 2021; Kusa et al., 2022; Ricciardi et al., 2022; Ruiz-Palomino et al., 2022; Suder et al., 2022; Erena et al., 2023) and still are being intensively developed (Hair et al., 2022; Pappas & Woodside, 2021). The main argument for their parallel use in research is the fact that they represent different approaches in the search for the expected relationships. Thus, they can be treated as complementary methods; their concurrent application broadens the view on the dependencies and relationships. For this reason, many researchers have recently used them simultaneously in their analyses (cf. Hernández-Perlines et al., 2021; Rasoolimanesh et al., 2021; Saha et al., 2022; Kusa et al., 2023; Suder, 2023).

4. Results

4.1. Results of PLS-SEM analysis

Due to the exploratory nature of the study and the relatively small sample size, the Partial Least Squares – Structural Equation Modelling (PLS-SEM) method was used for analysis. This method allows testing hypotheses in models with mediating effects (Nitzl et al., 2016) by treating variables as latent constructs. All independent variables in the SEM analysis were treated as reflective constructs, and PERF has been operationalised as a second-order construct (Sarstedt et al., 2019) obtained in two stages using the results of hidden variables. SmartPLS software (V.4.0.9.3) was used in this study (Ringle et al., 2022).

As recommended by Hair et al. (2022), the SEM analysis was performed in two stages. In the first part, the measurement model was validated, in which the correctness of the constructs in the model and the degree of matching of the model to the data were evaluated. In the second part, the research hypotheses proposed in the theoretical model were verified using the structural model.

Measurement model evaluation

The measurement model allows us to assess whether the considered constructs are correctly measured using selected indicators (Klarner et al., 2013). For the external model, the outer loading for individual indicators was assessed and the occurrence of the collinearity problem

was verified. Furthermore, the reliability and convergent validity of the constructs were examined. The results of these analyses are given in Figure 2. In addition, the discriminant validity of the constructs was assessed, and the results of this analysis are presented in Table 3.

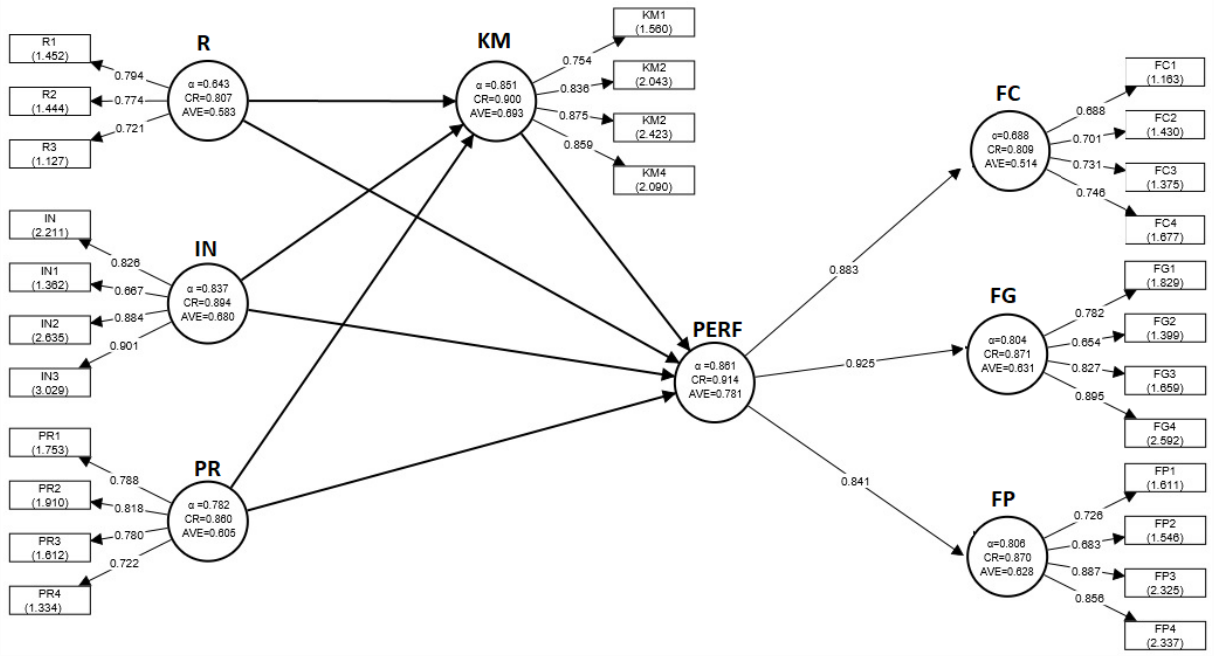

Figure 2. Measurement model results

Note: α = Cronbach's Alpha; CR = Composite reliability; AVE = Average Variance Extracted; values on arrows represent outer loadings (λ); values in brackets show variance inflation factor (VIF)

The evaluation of the measurement model includes the verification of outer loadings for each latent variable (for both first-order and second-order constructs). According to Kock (2014), the acceptability threshold for this measure is 0.7. However, following the indications of Hair et al. (2022), it is considered that a given indicator can be left if λ is greater than 0.5. All outers loading shown in Figure 2 meet this condition. VIF values are less than 3 or close to 3, which shows that there is no problem of collinearity of indicators for individual constructs (Diamantopoulos et al., 2012).

To assess the reliability of the constructs, the following measures were used: Cronbach alpha and composite reliability. According to Kock and Lynn (2012), the acceptable threshold for these indicators is 0.7; for seven out of the eight constructs, the values of these indicators are above this threshold, indicating that the indicators perform well in constructing the constructs. For one variable, namely risk-taking, Cronbach's alpha values are slightly below the acceptable threshold. But Hair et al. (2022) state that the acceptable range for Cronbach's alpha is 0.6-0.9. Moreover, the values of that construct obtained with the CR measure (Netemeyer et al., 2003),

which is a similar indicator to Cronbach's alpha, are therefore well above the acceptable thresholds. It proves that all constructs are internally consistent. The convergence validity test was based on the traditional measure, i.e., Average Variance Extracted (Fornell & Larcker, 1981), for which the acceptability threshold is 0.5. For all the constructs considered, this condition is met.

Analyses of individual measures lead to the conclusion that all indicators of constructs (latent variables) remain in further analysis and will be used in structural model to verify the hypotheses.

To assess to what extent individual constructs are independent and represent different latent variables, two discriminant validity criteria were used, namely, the Fornell-Larcker criterion (Forner & Lacker, 1981) and the Henseler criterion (Henseler et al., 2015). In the first criterion, the discriminant validity assessment consists of comparing the square root of AVE for each variable with the correlation coefficients of this variable with the other variables. If the root of AVE is greater than the correlation coefficient, the discriminant validity is confirmed. In turn, Henseler et al. (2015) pointed out that the lack of discriminatory validity is better detected by means of a heterotrait-monotrait relationship (HTMT), whose values must be below 0.85. For the considered constructs, both criteria are met (see Table 3), which proves their discriminant validity.

Table 3. Assessment of discriminant validity of the constructs – the Fornell-Larcker and Henseler (HTMT) criterion

Construct	Fornell-Larcker criterion					Henseler (HTMT) criterion			
	R	IN	PR	KM	PERF	R	IN	PR	KM
R	**0.764**								
IN	0.319	**0.825**				0.435			
PR	0.376	0.614	**0.778**			0.529	0.760		
KM	0.305	0.471	0.473	**0.832**		0.412	0.560	0.574	
PERF	0.398	0.534	0.553	0.536	**0.884**	0.523	0.607	0.655	0.611

Note: elements in bold on diagonal show square roots of AVE.

To verify the degree of fit of the data to the model, the SRMR measure (i.e., the standardised root mean squared residual (Henseler et al., 2015) was determined. According to Hu and Bentler (1999), the match level should be considered high if the SRMR value is below 0.08. In our analysis, a value of 0.072 was obtained, confirming the appropriate fit of empirical data to the model.

As a complement to the analysis of the measurement model, the model's explanatory power and in-sample predictive power were evaluated (Shmueli & Koppius, 2011; Rigdon, 2012) by counting measures R^2 and f^2, respectively. In particular, the R^2 allows one to assess the degree of explanation of the variance of endogenous variables. In turn, the effect size measure (f^2) evaluates the impact of individual exogenous variables on the variability of endogenous variables (Cohen, 1988). Table 4 shows the values of the above measures for the relationships specified in the model.

Table 4. Measures of model's explanatory power

Endogenous variable	Exogenous variable	R^2	f^2
KM	R	0.288	0.017
	IN		0.063
	PR		0.057
PERF	R	0.462	0.04
	IN		0.052
	PR		0.054
	KM		0.103

Table 4 shows that the three dimensions of EO together explain almost 29% of the variance of KM. In turn, these dimensions, together with KM, explain more than 46% of the variance of PERF. In the context of social research, such a level of explanation should be considered average (Falk and Miller, 1992; Hair, 2022).

The interpretation of the value of f^2 leads to the following conclusions. For KM as an endogenous variable, no effect size was obtained for R→KM ($f^2<0.02$). For the IN and PR variables, this effect is significant but small ($0.02<f^2<0.15$). For all relationships in which the result variable is PERF, the size effect is also small (but significant). The lowest value was obtained for R ($f^2=0.04$) and the highest for KM ($f^2=0.103$). Based on the effect size analysis, it can be concluded that variable R does not explain the variance of variable KM.

Structural model – hypothesis testing

To assess the significance of paths coefficients, on the basis of which it is possible to verify the hypotheses, the bootstrapping procedure with 5000 iterations was used (Streukens & Leroi-Werelds, 2016). A two-sided test with a standard 5% significance level was used. Figure 3 and Table 5 present the results of this analysis for direct relations, while Table 6 presents the results for mediation effects (indirect relations).

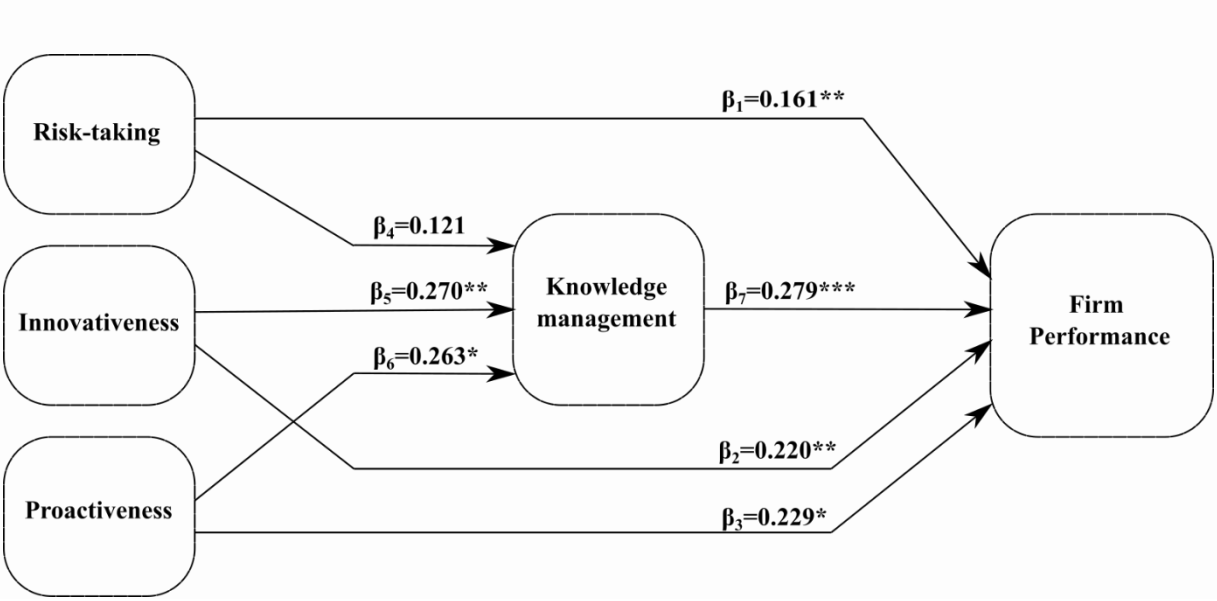

Figure 3. Structural model

Notes: *** p-value < 0.001, ** p-value < 0.01, * p-value < 0.05

Table 5. Results of PLS-SEM analysis for– direct effects

Hypothesis	Path	Original sample (β)	Bootstrapping			Results
			Sample mean (M)	T statistics	P values	
H_1	R → PERF	0.161	0.160	2.694	0.007	Confirmed
H_2	IN → PERF	0.220	0.222	2.667	0.008	Confirmed
H_3	PR → PERF	0.229	0.223	2.434	0.015	Confirmed
H_4	R → KM	0.121	0.119	1.453	0.146	Not confirmed
H_5	IN → KM	0.270	0.268	2.674	0.008	Confirmed
H_6	PR → KM	0.263	0.266	2.561	0.010	Confirmed
H_7	KM → PERF	0.279	0.284	3.387	0.001	Confirmed

For six (out of seven) direct relationships tested in the model, the path coefficients are statistically significant (p-value<0.05). In particular, the significant impact of all dimensions of EO on the company's performance was confirmed. For all these dimensions, this impact is positive; it is greater for innovativeness and proactiveness (β_2=0.220 and β_3=0.229) and slightly less for risk-taking (β_1=0.161). However, the results of the analysis revealed that KM has the greatest positive impact on firm performance; for the relationship KM→PERF, the value of the path coefficient is β_7=0.279 (p-value<0.001). In the light of the above results, all hypotheses regarding the direct impact on performance (i.e., hypotheses H_1, H_2, H_3, and H_7) have been confirmed.

From the structural model (cf. Figure 3) we conclude that two dimensions of EO, namely, IN and PR, have a significant positive impact on KM. The strength of their impact on KM is similar, that is, β_5=0.270 and β_6=0.263, respectively. For the relationship R→KM the path factor is also positive (β_4=0.121), but it is not statistically significant (p-value=0.146>0.05). On this basis, it can be concluded that hypotheses H_5 and H_6 have been confirmed and hypothesis H_4 has not been confirmed. The obtained results for direct relations are consistent with the previously conducted size effect analysis.

The results of the examination of the mediating role of KM are presented in Table 6; they lead to the following conclusions. The intermediate path coefficient for the relationship R→KM→PERF is statistically insignificant (β_8=0.034, p-value=0.22>0.05); thus, KM is not a mediator of the influence of R on PERF, so the hypothesis H_8 is not confirmed. In the case of IN, KM mediates its impact on the PERF; the coefficient for this intermediate relationship is β_9=0.075 and the p-value=0.026. Therefore, Hypothesis H_9 that KM is a mediator of the influence of IN on PERF is confirmed. Since the direct impact of IN on PERF is also positive and statistically significant, we are dealing with partial mediation. In turn, the results of the analysis for the third intermediate relation, that is, the PR→KM→PERF path, are ambiguous; despite the results of the previous stage (which showed that PR has a significant and positive effect on KM and in the same way that KM affects PERF), an intermediate path factor of 0.073 (not much less than for IN) is statistically insignificant (p-value=0.082>0.05). Thus, the mediating role of KM in the relationship between PR and PERF has not been demonstrated.

Table 6. Results of PLS-SEM analysis – indirect (mediating) effects

Hypothesis	Path	Original sample (O)	Bootstrapping			Results
			Sample mean (M)	T statistics	P values	
H8	R → KM → PERF	0.034	0.035	1.227	0.220	Not confirmed
H9	IN → KM → PERF	0.075	0.075	2.222	0.026	Confirmed
H10	PR → KM → PERF	0.073	0.078	1.739	0.082	Not confirmed

4.2. Results of fsQCA

In the fsQCA analysis, we considered models in which the configurations of four conditions, i.e., R, IN, PR and KM, lead to a high or low level of PERF. In this analysis, the values of the variables were calculated as the average of each indicator value.

This fsQCA examination was performed in accordance with the recommendations of Pappas and Woodside (2021) and used fsQCA 4.0 software (Ragin & Davey 2016; Ragin, 2018). In

particular, in our analysis, we calibrated the data, verified the presence of necessary conditions, built a truth table and prepared it for logical minimisation, and determined combinations of conditions sufficient for the considered result.

Data calibration

Data calibration is the process of encoding variables to values in the range of 0 to 1. For calibration, we used the "calibration" command in fsQCA 4.0, which is based on the logistic function (Ragin, 2008). In this procedure, we used the percentiles 0.95, 0.5 and 0.05 as the cut-off thresholds (Fiss, 2011); they are presented in Table 7. The results of the calibration process are shown in Figure 4.

Table 7. Calibration thresholds for conditions and outcome

Variable	Full member (0.95)	Cross-over point (0.5)	Full non-member (0.05)
R	6.15	4.00	1.37
IN	7.00	5.00	2.50
PR	6.61	4.63	2.75
KM	6.86	4.00	1.64
PERF	5.50	3.83	2.48

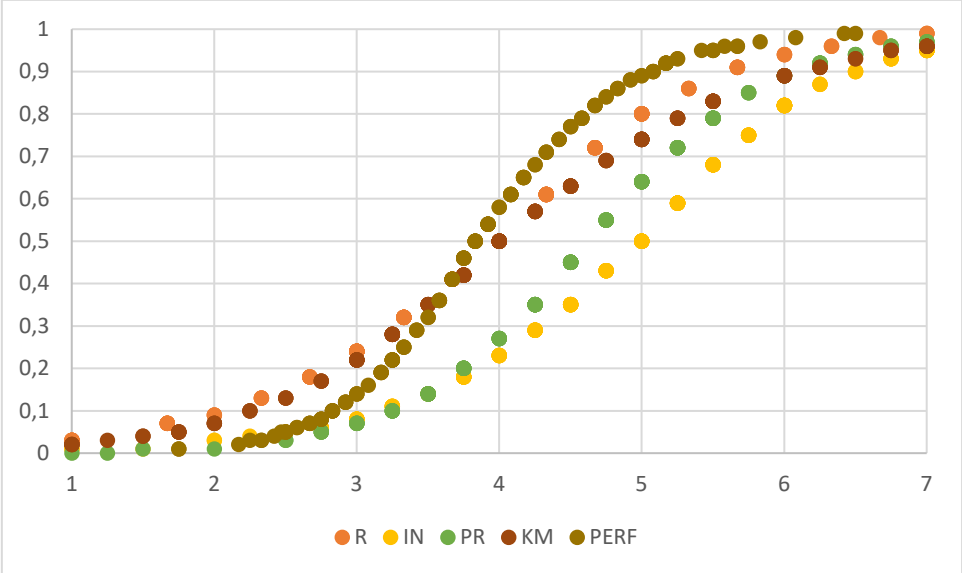

Figure 4. Results of data calibration

Analysis of necessary conditions

To verify whether in the set of four conditions under consideration there are those, without which it is impossible to achieve the appropriate outcome (presence of PERF or absence of

PERF), an analysis of necessary conditions was performed. Table 8 shows the results of this analysis, in particular the values of consistency and coverage for each condition.

Table 8. Analysis of necessary conditions

Condition	PERF		~PERF	
	consistency	coverage	consistency	coverage
R	0.726	0.727	0.578	0.584
~R	0.585	0.579	0.729	0.728
IN	0.780	0.777	0.527	0.529
~IN	0.528	0.525	0.778	0.781
PR	0.785	0.781	0.519	0.521
~PR	0.519	0.517	0.782	0.785
KM	0.806	0.772	0.577	0.557
~KM	0.538	0.558	0.764	0.799

Following Schneider and Wagemann (2012), the condition is necessary if the consistency measure is greater than 0.9. Based on the results in Table 8, we conclude that no condition is necessary to achieve a high PERF level, nor to obtain a low PERF level.

Bulding a truth table

Building a truth table aims to show all possible configurations of conditions and assess their representation in the analysed data and the strength of the association with the considered outcome (Ragin, 2008). Since we consider four conditions, the truth tables contain 2^4=16 rows. The truth table for the presence of PERF is presented in Appendix 2, and for the absence of PERF – in Appendix 3.

Based on the truth tables, those configurations that significantly lead to the result considered (i.e., PERF or ~PERF) were selected; the selection criteria for choosing configurations were the number of cases belonging to a given configuration and the value of raw consistency (Schneider & Wagemann, 2012). According to the guidelines provided by Papas and Woodside (2021), we assumed the frequency cutoff at level 2 (for both analyses) and the consistency cutoff for PERF at 0.83 and for ~PERF at 0.82. In the truth tables, those configurations that were taken into account at the next stage of the analysis are marked in bold.

Logical minimisation and sufficient conditions

The conditions sufficient for the outcomes were obtained by performing the logical minimisation process (Fiss 2011). The results of the minimising algorithm are shown in Table

9. Of the three types of solution obtained with fsQCA 4.0, an intermediate solution was presented (Rihoux & Ragin 2009). The assessment of the solutions correctness of the obtained was based on consistency and coverage measures. All the solutions obtained – both individually and collectively – meet the acceptability thresholds adopted in the literature (Rihonux & Ragin 2009) for these measures, that is, 0.75 for consistency and 0.25 for coverage (see Table 9).

Table 9. Combinations leading to presence or absence of firm performance

Conditions	Sets/Solutions				Sets/Solutions		
	Presence of PERF				Absence of PERF		
	S1	S2	S3	S4	P1	P2	P3
Risk-taking (R)	●	●					○
Innovativeness (IN)	●		●	●		○	
Proactiveness (PR)		●	●		○		
Knowledge management (KM)				●		○	○
Consistency	0.848	0.853	0.848	0.858	0.785	0.876	0.873
Raw coverage	0.622	0.626	0.686	0.679	0.782	0.653	0.616
Solution consistency	0.787				0.762		
Solution coverage	0.819				0.844		
frequency cutoff	2				2		
consistency cutoff	0.83				0.82		

● – present condition; ○ – absent condition;

The final result of fsQCA indicates four sufficient conditions (four solutions) which led to high company performance (see Table 9) in the examined companies. Three solutions (i.e., S1, S2, and S3) are combinations of two of the three EO dimensions; thus, each pair of the considered EO dimensions is a sufficient condition for a high outcome. This confirms the results of the SEM analysis regarding the impact of EO on performance. In solution S4, one of the two main conditions is KM; it occurs jointly with innovation. Therefore, this combination (S4) confirms the relevance of the indirect path IN→KM→PERF that was identified with SEM analysis.

The asymmetric nature of the fsQCA enables determining combinations of factors that lead to a low outcome. Three combinations of conditions were obtained; they are P1, P2, P3. Solution P1 indicates that the absence of proactiveness leads to a low PERF. The next two solutions are combinations of the absence of KM with the absence of IN (solution P2) and the absence of KM with the absence of R (solution P3). Thus, in these solutions, the role of KM in shaping PERF becomes relevant. Although KM did not play an important role in influencing the

presence of PERF (it was present in only one of the four solutions), the solutions for ~PERF show that a low level of KM with low IN or R leads to low performance.

5. Discussion

This study corresponds to several fields of research. Regarding the associations between EO and firm performance, the results are in line with the studies indicating the positive impact of EO (e.g., Lumpkin & Dess, 1996; Dess et al., 1997; Wiklund & Shephard, 2005; Roxas, 2009; Lechner & Gudmundsson, 2012), in particular, in SMEs (e.g., Sidek & Mohd Rosli, 2021; Isichei et al., 2020).

This study shows an association between risk-taking and firm performance. This finding supports previous studies indicating positive impact (e.g., Sanders & Hambrick, 2007; Ghotnian et al., 2012) and helps to clarify the ambiguous conclusions of other studies in this regard (e.g., Naldi et al., 2007), specifying that in small furniture companies this impact is positive.

The positive impact of innovativeness on performance in the examined sample confirms the results of previous studies in this field (e.g., Prahalad & Krishnan, 2008; Isichei et al., 2020; Li et al., 2023). As the performance was a second-order construct which comprises of firm competitiveness, firm growth, and financial performance, the results are relevant to the discussion about the influence of innovation on financial performance (Martínez-Ferrero & Frías-Aceituno, 2015; Patari et al., 2012).

Finally, results regarding positive impact of proactiveness on performance confirm previous observations in this regard (e.g., Lumpkin & Dess, 1996; Rauch et al., 2009; Tang et al., 2014; Liem et al., 2019; Isichei et al., 2020), especially those from in low-tech SMEs (e.g., Lomberg et al. (2017) as this study examined sample representing such enterprises.

The results of the study show that IN and PR positively impact KM. This observation confirms the results of previous studies in this field (see, e.g., Iqbal & Malik, 2019; Mostafiz et al., 2021; Adam et al., 2022). However, the observation that R does not impact KM is in contradiction to this line of reasoning, especially to the results presented by Nasution et al. (2021), who found that risk-taking and proactiveness are significantly associated with KM processes, while innovativeness is not. This ambiguity can be explained by observation that relationships among EO, KM, and performance can be complex; for example, EO can positively moderate the relationship between knowledge application and performance (Ha et al., 2021). Thus, since knowledge can help minimise a risk, knowledge management is not affected by risk.

The observation that KM positively impacts PERF corresponds to numerous studies in this field (Ha et al., 2021; Latif et al., 2021; Mbaidin, 2022), including those focused on SMEs (Abu Bakar et al., 2014; Mokhtarzadedeh et al., 2022). The hypothesis about positive impact of KM on PERF was proposed as the basis for our main hypotheses, which relate to the mediating role of KM in relationships between the dimensions of EO (R, IN, PR) and firm performance.

In this regard, only one mediation path has been confirmed as significant, namely IN→KM→PERF. This observation contributes to the body of research on the impact of EO on PERF that, in light of previous studies, is ambiguous (see, e.g., Rauch et al., 2009; Renko et al., 2009; Wales, 2016). In particular, it supports the position that this relationship can be complex (e.g., Andersen, 2009) and can be mediated by other factors (Real et al., 2014). In this study, the impact of one dimension of EO (i.e., IN) on performance is mediated by KM. This finding is in line with research showing the mediating role of knowledge-related factors (see, e.g., Chaithanapat et al., 2022; Bagorogoza & Nakasule, 2022), including the mediating role of KM in the relationship between EO and performance (Adam et al., 2022). Moreover, results of SEM are in line with those of fsQCA, that is, KM accompanied by IN leads to PERF, while the absence of KM (accompanied by the absence of R or IN) leads to the absence of PERF. The role of the combination of KM and IN can be justified as follows. Due to technological advances and the intensification of digitisation, the development and implementation of innovations is cost-intensive and time-consuming (moreover, the payback time is long) and for these reasons requires knowledge from different areas. The possession of knowledge and, above all, its efficient use (i.e., knowledge management) affects the outcome of a company and is the key to building a competitive advantage.

Concurrently, two other mediation paths examined in this study, namely R→KM→PERF and PR→KM→PERF are not significant in the sample examined. It confirms that the role of KM varies depending on the EO dimension. However, the findings of this study are contrary to those of Nasution et al. (2021) who showed that KM processes play a mediating role with respect to the impact of risk-taking and proactiveness on e-commerce adoption, while innovativeness does not play such a role; in our sample only impact of innovativeness is mediated.

The significance of knowledge sharing as a fundamental social activity cannot be understated. However, the translation of intention into action in knowledge sharing can be hindered by various barriers (Kuo & Young, 2008). One such barrier is the presence of a mistake-free culture, where individuals may be hesitant to share knowledge due to the fear of making errors or facing negative consequences. Additionally, deliberate misinterpretations by others can also impede knowledge sharing efforts, further discouraging individuals from engaging in this

behaviour. Applying the theory of planned behaviour (TPB) to study knowledge-sharing practises, researchers should place emphasis on control beliefs that reflect people's perceptions of the barriers and facilitators that influence their ability to engage in knowledge sharing. Control beliefs play a critical role in shaping individuals' intentions and actions. By understanding and addressing the control beliefs surrounding knowledge sharing, organisations can implement strategies to overcome barriers and create an environment conducive to effective knowledge sharing practises.

6. Conclusions

This study examined the role of knowledge management (KM) in the context of entrepreneurial orientation (EO) and its impact on firm performance. The study findings show that KM partially mediates the IN-PERF relationship and that KM accompanied by IN is a core condition that leads to PERF. Moreover, the absence of KM (accompanied by the absence of R or IN) leads to the absence of PERF. Additionally, the results show that all the variables examined (R, IN, PR, KM) positively impact PERF. These findings add value to the KM and EO literature by deepening our understanding of the role of the KM and EO dimensions (and their interactions) in improving firm performance. As the above relationships were observed in the sample consisting of small and medium-sized furniture manufacturers, they also contribute to the SME literature by adding evidence regarding the role of KM and the dimensions of EO in this type of enterprises.

The findings of this study have a meaningful managerial implication. The findings confirm the role of KM in enhancing entrepreneurial performance in traditional industries, such as furniture. They indicate that KM and innovativeness are keys to performance not only in high-tech industries, but also in low-tech industries. The results encourage entrepreneurs to develop entrepreneurial behaviours and KM in their firms, as all examined variables (R, IN, PR, KM) showed a positive impact on PERF.

Building upon the theory of planned behaviour, it is recommended that organisations consider the influence of employee personality traits when designing and implementing their knowledge management (KM) systems (Esmaeelinezhad & Afrazeh, 2018). By recognising and incorporating employees' personality characteristics, organisations can better understand and facilitate KM behaviours within their workforce; by aligning employees' personalities with the requirements of KM systems, organisations can enhance knowledge sharing, collaboration, and overall knowledge management effectiveness.

When generalising the findings of this study, some limitations should be considered; they are sourced in the sample, the selection of the variables, as well as their operationalisation. The number of enterprises in the sample was 150 which limited the statistical analysis of the data. Moreover, the sample represents only small and medium enterprises and one industry (furniture). Additionally, all the enterprises examined were located in one country; the socio-economic characteristics along with the high position of Polish furniture manufacturers in the international market can limit the generalisability of the results obtained. Thus, similar research in other industries and locations is recommended to confirm the findings in other contexts. Second, the proposed research model test only selected relationships among several variables that may be relevant to the objectives of this study. However, other linkages and other variables can be matching when considering performance in the entrepreneurial and knowledge-based perspective; in this study, the inclusion of more variables was impossible due to the sample size. Consequently, studies examining similar models are recommended as an extension of this study. Finally, other operationalisation of variables can result in different results. Thus, when comparing the findings of this examination with other studies, we should be aware of the way we conceptualise such complex variables as organisational entrepreneurship, knowledge management, and firm performance.

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Appendixes

Appendix 1. Construct items with basic statistics

Construct	Indicator	Abbreviation of item	Mean	St. dev.
Risk-taking (R)	We can accept a high level of risk if it offers a chance for above-average profits.	R1	3.76	1.77
	The term 'risk taker' is considered a positive attribute for people in our organisation.	R2	3.77	1.75
	Our employees are encouraged to take reasonable risks when implementing new ideas.	R3	4.15	1.84
Innovativeness (IN)	Our organisation seeks out new ways to do things.	IN1	5.13	1.83
	We actively introduce improvements and innovations in our organisation.	IN2	5.35	1.53
	We are innovative in the way we run our business.	IN3	4.68	1.49
	Innovation is the source of our success.	IN4	4.00	1.66
Proactiveness (PR)	We analyse our external environment thoroughly.	PR1	4.99	1.55
	We excel in identifying opportunities and societal needs.	PR2	4.72	1.50
	We strive to identify future trends.	PR3	4.98	1.56
	We initiate actions to which other organisations respond.	PR4	3.79	1.58
Knowledge management (KM)	Our business has implemented processes to gain knowledge from our suppliers, customers, and other partners.	KM1	3.71	1.83
	Our business has developed the ability to create new knowledge based on that was accessed previously.	KM2	4.78	1.60
	Our business has implemented processes to distribute knowledge inside the business.	KM3	4.01	1.87
	Our business has implemented processes to use knowledge to develop new products and services.	KM4	4.19	1.77
Firm competitiveness	We are one of the leading companies in our market in terms of our business.	FC1	4.00	1.61
	Relative to competing products, our products are more successful in terms of sales.	FC2	4.06	1.21
	We have been able to attract new customers this year.	FC3	4.57	1.66

		Our customers are more satisfied than our competitors' customers.	FC4	4.71	1.33
	Firm growth (FG)	We are developing faster than our competitors.	FG1	3.97	1.42
		We are strongly focused on the growth of our company (e.g., increasing turnover, employment, market share).	FG2	4.43	1.76
		We are developing much faster than expected.	FG3	3.73	1.61
		Our sales are growing much faster than we expected.	FG4	3.43	1.63
	Financial performance (FP)	Compared to our competitors, we achieve better economic results.	FP1	3.67	1.21
		Our operational costs are lower than those of our competitors.	FP2	3.78	1.39
		Our profitability has increased.	FP3	3.72	1.58
		Our profits are much higher than we expected.	FP4	3.20	1.65

Appendix 2. Truth table for outcome PERF

R	IN	PR	KM	number of cases	PERF	raw consistency
1	**1**	**1**	**1**	**23**	**1**	**0.92336**
0	**1**	**1**	**1**	**13**	**1**	**0.89883**
1	**1**	**1**	**0**	**6**	**1**	**0.88059**
1	**0**	**1**	**1**	**2**	**1**	**0.87460**
1	**1**	**0**	**1**	**4**	**1**	**0.86869**
0	**1**	**0**	**1**	**2**	**1**	**0.86607**
1	**1**	**0**	**0**	**3**	**1**	**0.85245**
1	**0**	**1**	**0**	**2**	**1**	**0.84511**
0	**1**	**1**	**0**	**3**	**1**	**0.83192**
1	0	0	1	5	0	0.80569
0	0	0	1	9	0	0.79756
0	0	1	0	6	0	0.78452
0	1	0	0	5	0	0.77117
1	0	0	0	8	0	0.74766
0	0	0	0	25	0	0.61764

Appendix 3. Truth table for outcome ~PERF

R	IN	PR	KM	number of cases	~PERF	raw consistency
0	**0**	**0**	**0**	**25**	**1**	**0.935255**
1	**0**	**0**	**0**	**8**	**1**	**0.926169**
0	**0**	**1**	**0**	**6**	**1**	**0.904796**
0	**1**	**0**	**0**	**5**	**1**	**0.8879**
0	**0**	**0**	**1**	**9**	**1**	**0.879885**
1	**0**	**0**	**1**	**5**	**1**	**0.877722**
1	**1**	**0**	**0**	**3**	**1**	**0.86647**
1	**0**	**1**	**0**	**2**	**1**	**0.854592**
0	**1**	**0**	**1**	**2**	**1**	**0.852872**
0	**1**	**1**	**0**	**3**	**1**	**0.839231**

1	**1**	**0**	**1**	**4**	**1**	**0.822996**
1	0	1	1	2	0	0.798889
1	1	1	0	6	0	0.773406
0	1	1	1	13	0	0.686736
1	1	1	1	23	0	0.562515