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INTELLECTUAL CAPITAL, ENTREPRENEURIAL ORIENTATION AND GREEN INNOVATION IN ITALIAN SMES

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Abstract

Purpose. *This study aims to examine the relationships between Intellectual Capital (IC), entrepreneurial orientation (EO) and green innovation in small and medium-sized Italian enterprises (SMEs). Specifically, it investigates how different components of Intellectual Capital influence the dimensions of entrepreneurial orientation and how these, in turn, impact green innovation.*
Design/methodology/approach. *A structural model is developed and tested using data from a sample of 210 Italian SMEs. The model is analysed using the PLS-SEM technique.*
Findings. Results show that Structural Capital has a significant, positive influence on all three dimensions of entrepreneurial orientation (innovativeness, proactiveness and risk-taking). Human Capital positively impacts risk-taking, while Relational Capital positively influences innovativeness. The only EO dimension that demonstrates a significant, positive relationship with green innovation is innovativeness.
Practical and Social Implications. *The study highlights the importance of SMEs investing in Structural Capital to foster entrepreneurial orientation. Moreover, it underscores the critical role of innovativeness in driving green innovation, suggesting that cultivating a culture of creativity and experimentation could be key to advancing environmental sustainability efforts.*
Originality of the Study. *This research contributes to the existing literature by providing empirical evidence on the interplay between IC, EO and green innovation in the context of Italian SMEs. It offers a more nuanced understanding of how different components of Intellectual Capital influence specific dimensions of entrepreneurial orientation and how these translate into green innovation.*

1. Introduction

Knowledge-based resources play a crucial role in achieving company success and sustained competitive advantages in the current economic landscape, which is heavily influenced by rapid technological advances, society and communication (Cooper et al., 2023). Within this framework, these essential resources, for example, Intellectual Capital (IC), are unique and effective variables in driving innovation, enhancing company performance and attaining a competitive edge (Yaseen et al., 2023; Garcia-Perez et al., 2020). Intellectual Capital primarily encompasses Human, Relational and Structural Capital (Bontis, 2001; Paoloni et al., 2023). Several research studies have demonstrated that IC has a beneficial impact on various aspects, including the identification and pursuit of opportunities, the quality and speed of decision-making, competitive advantage, financial performance and innovation performance (Agostini et al., 2017; Palazzi et al., 2020; Ciambotti et al., 2023). Recent research has emphasised the connection between IC and entrepreneurial orientation (EO), which refers to a company's dedication to inventiveness, proactiveness and the willingness to take risks (Yaseen et al., 2023). Researchers have proposed that the interplay between IC and EO improves the performance of organisations and their ability to innovate, ensuring long-term sustainable growth (Alshahrani et al., 2024; Chaudhary et al., 2023; Garcia-Perez et al., 2020; Paoloni et al., 2020; Yaseen et al., 2023). Therefore, to better understand the relationship between IC and EO, and their influence on a company's success, it is necessary to study these components jointly. Unfortunately, existing research lacks information on the impact of the combination of IC and EO on a firm's performance, specifically concerning green innovation performance (Marco-Lajara et al., 2023; Wang et al., 2023). Green innovation is a component of social innovation, which refers to solutions to social problems inadequately addressed by existing institutional and organisational structures. It encompasses various issues such as poverty, exclusion, health, education, employment, rights and the environment (Vézina et al., 2019). From a social perspective, green innovation (GI) refers to a business's methods to minimise the negative impact of its activities on the natural environment (Shahzad et al., 2020). Despite an increasing interest in improving the theoretical and empirical basis for understanding the connection between IC, EO and business performance, very few studies have integrated these factors (Yaseen et al., 2023; Garcia-Perez et al., 2020), particularly in the context of green innovation. This study aims to address the existing gap in the literature by examining the influence of IC on EO and its subsequent impact on green innovation. To uphold our hypotheses, we have created a structural model and conducted an empirical examination using a sample of 210 small and medium-sized Italian firms (SMEs).

Hence, this study aims to answer the following research questions: (RQ1) Does Intellectual Capital impact firms' entrepreneurial orientation? (RQ2) Does entrepreneurial orientation impact on firms' green innovation?

This study can be deemed innovative for two primary reasons. Firstly, it adds to the discussion of the factor that could potentially influence the effect of IC on performance by considering EO as a mediating variable. Furthermore, our study aims to improve our comprehension of how IC improves EO by examining the individual effects of each component of IC (namely, Human Capital, Relational Capital and Structural Capital) on EO. Understanding the influence of SMEs' IC and EO on green innovation is crucial for achieving sustainable development. SMEs in Europe make up 99% of businesses and play a vital role in supporting the full realisation of the 2030 Agenda, with a particular focus on green innovation. Agenda 2030 establishes the basis for a transformation in the SME landscape, where being socially, economically and environmentally aware becomes a crucial factor in attaining a competitive edge (Costa et al., 2022; Thomas et al., 2022; Matarazzo et al., 2024). The paper is organised in the following manner: section two presents a concise overview of the literature and the creation of the hypothesis. Part three outlines the study methods. Finally, the findings, discussion and conclusions are presented.

2. Literature Review and Hypothesis Development

The latest research indicates that enhancements in companies' performance result from the synergistic impact of IC and EO (Adomako, 2018; Yaseen et al., 2023; Alshahrani et al., 2024), as EO plays a crucial role in leveraging IC (Yaseen et al., 2023; Alshahrani et al., 2024).

In the past decade, numerous studies have been conducted to highlight the pivotal role of IC in firms' success (Dabić et al., 2021; Paoloni et al., 2023), operating both in the profit (Modaffari et al., 2023) and non-profit sectors (Bontis et al., 2018), and four main research streams on IC emerged (Bellucci et al., 2021): reporting and disclosure of Intellectual Capital; Intellectual Capital studies within universities, education and the public sector; knowledge management; and the relationship between Intellectual Capital, financial performance and market value.

Most studies consider IC as the sum of human, relational and Structural Capital (Sgrò, 2021; Paoloni et al., 2023); however, other elements, such as entrepreneurial, renewal and trust capital, are important for SMEs' success due to enabling high innovation performance, organisational growth, the ability to overcome radical changes in the market (Paoloni et al., 2015; Demartini and Beretta, 2022) and positively affecting a broad range of financial performance metrics (Bansal et al., 2023).

Entrepreneurial orientation refers to firms' strategic approach regarding the decision-making process and operational behaviour. It includes the procedures, tactics and decision-making methods that enable entry into markets (Rahman et al., 2024). The concept of EO, according to scholars, encompasses three dimensions: innovativeness, proactiveness and risk-taking (Alshahrani et al., 2023). Innovativeness (INND) is the measure of a company's dedication to promoting creativity, experimentation and launching new products or services (Rahman et al., 2024). Proactiveness (PRO) entails the ability to anticipate and promptly address market demands by introducing products or services before competitors and preparing for anticipated future needs (Rahman et al., 2024). Risk-taking entails displaying a willingness to engage in actions despite uncertainty. These actions can involve the exploration of various markets or the allocation of resources towards enterprises, which may have unpredictable effects. Risk-taking (RISK), as experts understand it, pertains to the readiness of managers to undertake bold initiatives that could result in failure. Companies might exploit possibilities that careful competitors might miss by taking risks. According to Swink (2003), motivating team members to take ownership of projects by making resource commitments encourages risk-taking behaviour and increases their tolerance for hazards. Although taking risks might provide a competitive edge, it is crucial to carefully consider the potential for significant losses if these hazardous ventures fail (Rahman et al., 2024). EO has been recognised as a significant component that influences a company's performance, as evidenced by research demonstrating a favourable correlation between EO and performance (Rahman et al., 2024; Rauch et al., 2009). This link has been explained from several viewpoints, including the resource-based view and resource orchestration theory. EO, or entrepreneurial orientation, plays a role in developing advantages and boosting business performance by facilitating the mobilisation and effective use of resources in a proactive and risk-embracing strategy (Miao et al., 2017). However, according to Hanifah et al. (2022), while EO is critical for fostering innovation and knowledge sharing within organisations, its effects could be limited in the context of SMEs due to cultural and industry-specific constraints.

Intellectual Capital, a knowledge-based resource, has high value, scarcity and resistance to imitation or substitution. It aids organisations in developing and executing strategies that enhance their efficiency, effectiveness and innovation (Bontis, 2001; Paoloni et al., 2023). Several authors (Chen et al., 2014; Riahi-Balkaoui, 2003; Bontis et al., 2018) have contended that IC is a crucial asset that every organisation should cultivate and oversee to successfully execute corporate strategy, attain and sustain a durable competitive advantage and enhance corporate performance. This choice is especially applicable to small and medium-sized enterprises (SMEs), as their

success often relies on the expertise, experience and abilities of the owner and the employees rather than on tangible and financial assets. Additionally, SMEs often face limitations in utilising their knowledge due to insufficient resources (Crupi et al., 2021; Paoloni et al., 2023). Furthermore, in small and medium-sized enterprises (SMEs), the turnover of staff and extended periods of absence deter the accumulation of knowledge within the organisation. And due to the limited number of employees, it is difficult to find a suitable replacement quickly. Human, Relational and Structural Capital are the most valuable resources for achieving corporate success and establishing a lasting competitive advantage (Buenechea-Elberdin et al., 2017; Crupi et al., 2021).

Human Capital (HC) is considered a crucial strategic resource, encompassing the knowledge possessed by employees in terms of their education, competence, experience, skills, creativity and problem-solving ability (Kianto et al., 2017; Inkinen, 2015; Youndt and Snell, 2004). Human Capital diversity encompasses all these factors, and a greater level of diversity leads to an increased capacity for generating distinct ideas and inventive solutions (Han et al., 2014). The primary driver of innovation performance and adaptation to strategy changes is a well-trained and educated workforce (Cabrilo and Grubic-Nesic, 2013; Paoloni et al., 2023). According to Palazzi et al. (2020), HC significantly enhances product and process innovation and employees with diverse experiences and creative problem-solving abilities contribute to the generation of novel ideas and practical solutions that drive innovation. Moreover, HC supports a culture of adaptability and creativity, driving innovative processes and solutions that are essential in dynamic markets (De Martini et al., 2017). Its impact is further amplified when combined with other dimensions of intellectual capital, such as structural and relational capital, creating synergies that maximise the effectiveness of organisational knowledge assets. Strategically, investing in HC through employee training, education and development ensures that firms remain competitive, innovative and capable of responding to evolving market demands, positioning them for long-term growth and sustainability (Cattafi et al., 2023). An environment that promotes ongoing learning and professional growth among team members guarantees that the most up-to-date knowledge, trends and technologies are incorporated into the business operations, hence encouraging innovation (Cabrilo and Dahms, 2020; Chaudhary et al., 2023). Furthermore, the generation of novel information relies on the existing pool of knowledge assets within any firm, primarily associated with employees and management. This knowledge allows for the identification and exploitation of creative prospects (Alshahrani et al., 2024). HC provides firms with specialised knowledge and skills to promote innovation, encourage proactivity and mitigate risks (Yaseen et al., 2023). Therefore, HC empowers employees to generate novel

ideas and devise inventive solutions by virtue of their extensive education, training and specialised knowledge (Cabrilo and Dahms, 2020; Chaudhary et al., 2023). Furthermore, proficient personnel frequently possess a heightened awareness of prevailing market trends. They possess the ability to predict forthcoming requirements, resulting in proactive actions, and they are more inclined to proactively recognise opportunities and respond more swiftly than their rivals. Proficient employees possess a high level of expertise and understanding, which enables them to handle risks confidently and efficiently. Enhanced education and training empower employees to evaluate risks with greater precision and make well-informed decisions (Yaseen et al., 2023). Thus, we propose the following hypotheses:

H1: There is a positive, direct relationship between HC and INND
H2: There is a positive, direct relationship between HC and PRO
H3: There is a positive, direct relationship between HC and RISK

Relational Capital (RC) refers to the collective value of a firm's relationships with external stakeholders and could enhance innovation performance, as not all the knowledge required for innovation is confined within the firm's boundaries. This detail has been supported by studies conducted by Buenechea-Elberdin et al. (2017) and Ciambotti et al. (2023). RC, in general, refers to the connections and interactions a company has with its consumers, suppliers and public and private entities (Kianto et al., 2017; Paoloni et al., 2023). The establishment of inter-firm linkages creates a robust network that facilitates the acquisition and enhancement of new resources and capabilities, fosters collaboration among partners, enables cost and risk sharing, reduces information imbalances and enhances innovation performance (Buenechea-Elberdin et al., 2017). Thus, through the interconnected web of interactions, every company can gather vital feedback that can fuel the advancement of innovative solutions (Yaseen et al., 2023). These interactions create a dynamic flow of information, enabling firms to identify emerging trends, refine their strategies and co-create value with stakeholders (Agostini et al., 2017). Furthermore, resource configuration (RC) plays a crucial role in facilitating the identification and utilisation of opportunities, as well as enhancing the proactive nature of entrepreneurial firms through the expansion of their business networks (Ciambotti et al., 2023). By effectively leveraging RC, companies can build resilience, face uncertainties and maintain a competitive edge in complex and volatile environments (Hanifah et al., 2022). The relationships that a corporation has with its stakeholders can offer valuable information about market changes and future trends, allowing the firm to establish proactive strategies for finding new opportunities and staying ahead of industry advances (Paoloni et al., 2023). Furthermore, such proactive engagement fosters stronger

trust and collaboration with stakeholders, enhancing the corporation's reputation and its ability to forge long-term partnerships (Palazzi et al., 2020). Ultimately, participating in a network allows for the dispersion of risk among collaborators, lessening the load on any individual participant. By establishing robust partnerships and fostering collaboration with diverse stakeholders, firms can effectively distribute the risks associated with innovative projects, new ventures or market uncertainty (Hock-Doepgen et al., 2021). Thus, we propose the following hypotheses:

H4: There is a positive, direct relationship between RC and INND
H5: There is a positive, direct relationship between RC and PRO
H6: There is a positive, direct relationship between RC and RISK

Structural Capital (SC) encompasses the implicit knowledge embedded in information systems, processes and other organisational structures (Inkinen, 2015; Khalique et al., 2022). Put simply, SC can be defined as the collective knowledge that remains within a company even after employees and management have left (Youndt & Snell, 2004). Knowledge Management systems are tools that collect and distribute information and best practices throughout a company, promoting a culture of ongoing development and innovation (Kianto et al., 2017). These technologies facilitate the gathering, retention and enhancement of shared information, enabling a company's operations and endeavours to contribute to innovation performance (Beltramino et al., 2020) and the exploration and exploitation of entrepreneurial chances (Ahmed et al., 2020; Al-Omoush, 2021). Efficient procedures facilitate the speedy development and implementation of creative ideas (Lumpkin and Lichtenstein, 2005), as well as the ability to foresee future market needs and proactively create customised solutions (Al-Omoush, 2021). Hence, SC facilitates the process of organisational learning, equips organisations with the necessary resources to adapt to unpredictable circumstances promptly and improves their ability to be proactive and agile (Al-Omoush, 2021). Thus, we propose the following hypotheses:

H7: There is a positive, direct relationship between SC and INND
H8: There is a positive, direct relationship between SC and PRO
H9: There is a positive, direct relationship between SC and RISK

The strategic utilisation of IC can facilitate and enhance organisations' innovativeness, proactiveness and willingness to take risks (Wales et al., 2019; 2021). Therefore, companies' capacity to utilise Intellectual Capital will improve their ability to innovate (Inkinen, 2015; Yaseen et al., 2023; Ali et al., 2021; Garcia-Perez et al., 2020). Environmentally sustainable development is recognised as one of the three essential elements (environmen-

tal, social and economic) of sustainable development. It is equally significant and can be seen as an integrated approach to sustainability (Nogueira et al., 2022). This study focuses on the environmental aspect of sustainable development, specifically addressing the preservation of natural and renewable resources, responsible waste management, the maintenance of clean air and water and the reduction of harmful gas emissions (Galdeano-Gomez et al., 2013).

Green innovation refers to the process by which companies reduce or eliminate the harmful effects of their operations on the environment (Fernando et al., 2019) and to the development of products, processes, technologies and management structures intending to safeguard the natural environment. This is achieved by reducing resource usage and effectively managing waste and pollution. Several researchers have examined the determinants of green innovation, including market demands (Lin et al., 2014), business ethics (Chang, 2011), relationships with external and internal stakeholders (Weng et al., 2015), environmental norms, technological advancement (Cai and Li, 2018) and intangible assets (Awan et al., 2023; Dangelico et al., 2017).

EO is a significant catalyst for innovation (Pérez-Luño et al., 2011; Madhoushi et al., 2011; Freixanet et al., 2021). Explicitly, EO refers to a company's readiness to endorse novel concepts, conduct experiments and engage in innovative procedures (Yaseen et al., 2023). An intense focus on innovation can propel the advancement of environmentally friendly technologies and sustainable products (Wang et al., 2023). Organisations characterised by a high level of innovativeness are inclined to allocate resources towards research and development activities that create environmentally friendly solutions. Additionally, they are more prone to embracing new environmentally conscious practices and incorporating sustainability principles into their product designs (Sánchez-Sellero and Bataineh, 2022). Companies that have a strong inclination towards taking risks are more likely to invest in unclear or unproven innovations (Yan et al., 2021). Green innovation frequently entails significant upfront expenses and unpredictable returns, rendering it a risky endeavour (Martínez-Ros and Kunapatarawong, 2019). Companies that adopt a proactive approach towards risk are more inclined to engage in the creation and implementation of environmentally-friendly innovative technologies and sustainable practices, even in the face of potential financial uncertainty (Yan et al., 2021). In addition, forward-thinking organisations are likely to acknowledge the growing significance of environmental sustainability and act before their competitors to create environmentally-friendly inventions (Basbeth et al., 2019). By adopting a forward-thinking attitude, they can take advantage of growing opportunities in the green market and position themselves as pioneers in sustainability (Johl and Toha, 2021). Hence, the collective impact of these

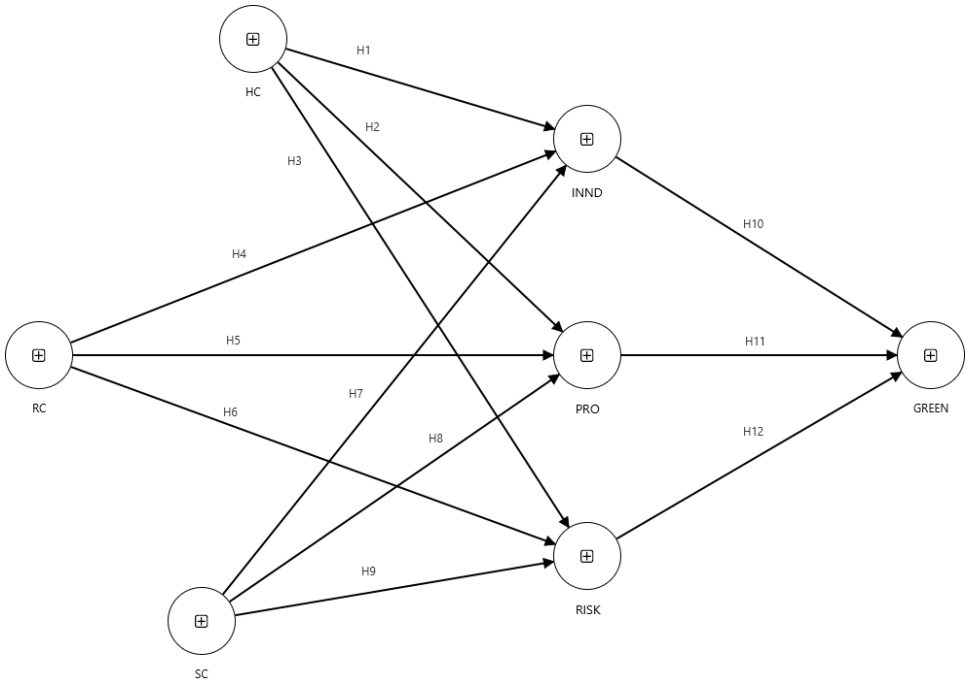
characteristics of entrepreneurial orientation (innovativeness, proactiveness and risk-taking) might generate a synergistic outcome that amplifies green innovation. Based on the information provided, this study aims to examine the following research hypotheses:

H10: There is a positive, direct relationship between INND and green innovation (GREEN).

H11: There is a positive, direct relationship between PRO and green innovation (GREEN).

H12: There is a positive, direct relationship between RISK and green innovation (GREEN).

Fig.1 shows the research model.



3. Methodology

3.1. Data Collection

This research employs a survey methodology and is designed as a cross-sectional study. The definition of SMEs we adopted follows the Commission Recommendation 2003/361/EC. However, in line with previous

studies, SMEs were identified solely based on the number of employees (10–249) to ensure comparability of results.

Quantitative data were collected in 2024 from Italian small and medium-sized enterprises (SMEs). We picked a random sample of 2.000 SMEs located in Central Italy from AIDA's Bureau van Dijk database. The rationale behind the sample stems from the low response rates commonly reported in similar studies (e.g., Giampaoli et al., 2024). First, given an expected average response rate of approximately 10%, 2.000 SMEs were randomly chosen to ensure a sufficient number of responses for the robustness of the statistical model. Additionally, the focus on Central Italy was motivated by the geographical proximity of the university conducting the study, which is well-known among local SMEs. This familiarity was expected to encourage participation in the survey.

We dispatched an invitation for participation in this research to their officially verified email address (PEC). In the email body, we articulated the research objective and provided the option to obtain a summary of the findings to enhance response rates. The invitation pertained to an online inquiry conducted via the Google Form survey platform.

From January to February 2024, we collected 264 responses. This timeframe was chosen to ensure that the performance-related responses referred to the three-year period (2021–2023). To ensure accurate results, we excluded 54 responses as they were not from key informants (CEO, entrepreneur, manager). The final sample consists of 210 responses representing 10.5% of the population. Of the final sample, 50% of respondents are CEOs or entrepreneurs, 16% are CFOs, and the remaining 34% represent COOs, CHRMs, CIOs and CSOs. The main sectors in the sample are manufacturing (44%), services (13%) and commerce (10%), while the remaining 33% are transportation, hospitality industry and construction. Finally, 83% of firms employ between 10 and 49 employees, while 17% between 50 and 249 employees.

3.2 Measurement Model

Intellectual Capital is measured through three dimensions (Human Capital, Structural Capital and Relational Capital), using the scales of Giampaoli et al. (2024). Entrepreneurial orientation includes innovativeness, proactiveness and risk-taking, whose scales are taken from Khedhaouria et al. (2015), while the green innovation scale is adapted from Shahzad et al. (2020). All items were rated on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

4. Findings

To test our measurement model, the psychometric properties of the scale were assessed. Reliability and convergent validity were checked using Cronbach's alpha ($\alpha \geq 0.7$), Dillon-Goldstein's rho ($\rho_c \geq 0.7$) and average variance extracted (AVE ≥ 0.5). Results are shown in Tab.1. All values are above the recommended thresholds, and reliability and convergent validity are assured.

Tab.1 Reliability and Convergent Validity

Reliability and Convergent Validity					
Inherent variables	Items	Loadings	Cronbach's alpha	Dillon-Goldstein rho	AVE
GREEN			0.896	0.928	0.764
	GREEN1	0.885			
	GREEN2	0.915			
	GREEN3	0.906			
	GREEN4	0.784			
HC			0.912	0.944	0.849
	HC1	0.921			
	HC2	0.943			
	HC3	0.900			
INND			0.861	0.915	0.783
	INND1	0.811			
	INND2	0.943			
	INND3	0.895			
PRO			0.887	0.930	0.816
	PRO1	0.879			
	PRO2	0.885			
	PRO3	0.944			
RC			0.927	0.953	0.872
	RC1	0.921			
	RC2	0.935			
	RC3	0.945			
RISK			0.805	0.874	0.699
	RISK1	0.871			
	RISK2	0.820			
	RISK3	0.816			
SC			0.907	0.935	0.781

	SC1	0.896			
	SC2	0.861			
	SC3	0.879			
	SC4	0.899			

Discriminant validity was checked using the Fornell-Larker criterion and HTMT ratio. Discriminant validity aims to check that the selected latent variables or composites measure different concepts. Fornell-Larker criterion requires that, for a specific construct, all the values in the rows and columns (correlations) are below the values in the diagonal, the square root of AVE. HTMT criterion is a new method to assess for discriminant validity (Henseler et al., 2015) and requires that the values shown in the column are below the threshold of 0.90. As shown in Tab.2 and Tab.3 all the values are below the threshold, and discriminant validity is assured. The second-order construct (entrepreneurial orientation) has been tested following the procedure of Becker et al. (2012). Finally, having gathered data from a single respondent we checked for common method bias using Harmann's one-factor test and the marker variable approach. The first one requires that no factor explains more than 50% of the variance, while the marker variable approach tests for variations in the relationship among constructs when including the marker variable in the model. Results indicate that there is no common method bias.

Tab.2 Fornell-Larker

Fornell-Larker							
	GREEN	HC	INND	PRO	RC	RISK	SC
GREEN	0.874						
HC	0.419	0.922					
INND	0.542	0.482	0.885				
PRO	0.431	0.425	0.682	0.903			
RC	0.355	0.547	0.468	0.349	0.934		
RISK	0.441	0.494	0.733	0.666	0.387	0.836	
SC	0.501	0.680	0.627	0.559	0.559	0.544	0.884

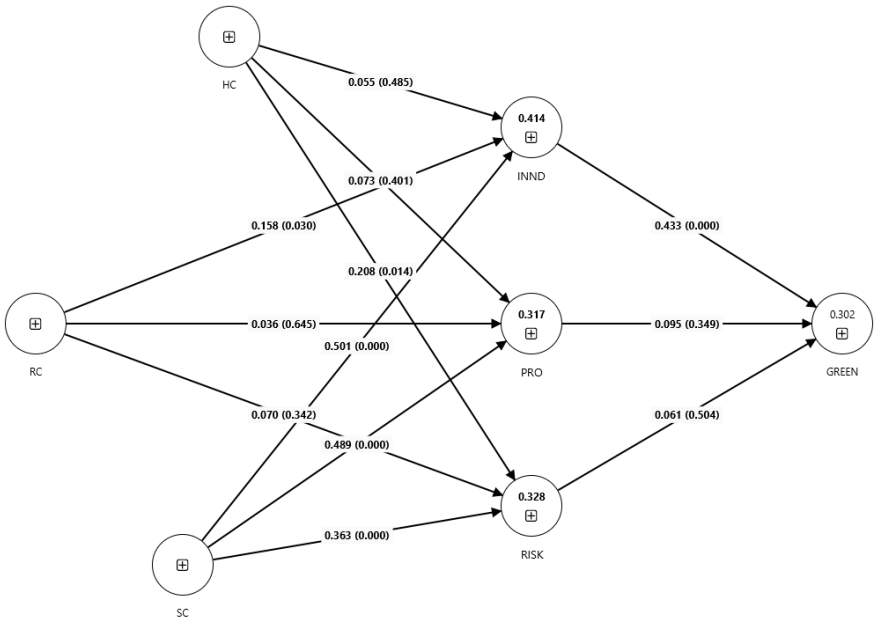
Tab.3 HTMT

HTMT							
	GREEN	HC	INND	PRO	RC	RISK	SC
GREEN							
HC	0.456						

INND	0.614	0.525					
PRO	0.481	0.466	0.780				
RC	0.385	0.590	0.515	0.381			
RISK	0.462	0.511	0.784	0.763	0.408		
SC	0.554	0.741	0.694	0.619	0.608	0.572	

For data analysis, we used the PLS-SEM technique with SmartPLS 4.1.0.4. This technique is widely used in the field of intellectual Capital as it deals with both common factors and composites as in the case of Intellectual Capital. Moreover, different from the CB-SEM method, whose goal is theory confirmation, PLS-SEM aims to predict a targeted construct and discover new relationships between latent variables. Considering the explorative nature or this study, PLS-SEM seems to be the most appropriate choice.

Fig.2 and Tab.4 show the results of the structural model.



Tab.4 Research Model Results

HYPOTHESIS	PATH	PATH COEFFICIENT	T-VALUE	P-VALUE	STATUS
H1	HC -> INND	0.055	0.698	0.485	NOT SUPPORTED
H2	HC -> PRO	0.073	0.840	0.401	NOT SUPPORTED

H3	HC -> RISK	0.208	2.465	0.014	SUPPORTED
H4	RC -> INND	0.158	2.174	0.030	SUPPORTED
H5	RC -> PRO	0.036	0.461	0.645	NOT SUPPORTED
H6	RC -> RISK	0.070	0.950	0.342	NOT SUPPORTED
H7	SC -> INND	0.501	7.904	0.000	SUPPORTED
H8	SC -> PRO	0.489	6.059	0.000	SUPPORTED
H9	SC -> RISK	0.363	4.439	0.000	SUPPORTED
H10	INND -> GREEN	0.433	4.251	0.000	SUPPORTED
H11	PRO -> GREEN	0.095	0.937	0.349	NOT SUPPORTED
H12	RISK -> GREEN	0.061	0.668	0.504	NOT SUPPORTED

5. Discussions

Tab.4 shows that:

H1 (HC -> INND) is not supported: this unexpected result suggests that Human Capital alone may not directly translate into a commitment to fostering creativity, experimentation and new product/service introduction. It's possible that while employees possess valuable knowledge and skills, organisational factors or resource constraints may be limiting their ability to engage in innovative activities.

H2 (HC -> PRO) is not supported: the lack of support for this hypothesis indicates that Human Capital is not significantly contributing to anticipating and responding to market demands ahead of competitors, which could suggest that other factors, such as organisational structure or market intelligence systems, play a more crucial role in enabling proactive behaviour.

H3 (HC -> RISK) is supported (β=0.208; p-value=0.014): this result aligns with the definition of risk-taking as managers' willingness to make risky commitments. It suggests that in Italian SMEs, higher levels of Human Capital led to increased confidence in making decisions with uncertain outcomes, possibly due to better assessment and management of potential risks.

H4 (RC -> INND) is supported (β=0.158; p-value=0.030): the positive relationship between Relational Capital and innovativeness indicates that external relationships are contributing to Italian SMEs' commitment to creativity, experimentation and new product/service introduction. This suggests that these firms are effectively leveraging their networks to foster innovativeness.

H5 (RC -> PRO) is not supported: surprisingly, Relational Capital does

not significantly contribute to proactiveness in Italian SMEs, which suggests that these firms may not be fully utilising their external relationships to anticipate market demands and prepare for future needs ahead of competitors.

H6 (RC -> RISK) is not supported: the lack of support for this hypothesis implies that Relational Capital is not significantly influencing managers' willingness to make risky commitments in SMEs, which could indicate that risk-taking decisions are more influenced by internal factors than external relationships.

H7, H8 and H9 (SC -> INND, SC -> PRO, SC -> RISK) are all supported (H7: β=0.501; p-value=0.000; H8: β=0.489; p-value=0.000; H9: β=0.363; p-value=0.000). These results highlight the critical role of Structural Capital in fostering all aspects of entrepreneurial orientation, which suggests that organisational processes and systems are key drivers in promoting creativity and experimentation, enabling anticipation of market demands, and supporting managers' willingness to make risky commitments.

H10 (INND -> GREEN) is supported (β=0.433; p-value=0.000): the strong relationship between innovativeness and green innovation suggests that Italian SMEs' commitment to creativity, experimentation and new product/service introduction is positively influencing their development of green innovation.

H11 (PRO -> GREEN) is not supported: this unexpected result implies that the ability to anticipate and respond to market demands ahead of competitors does not necessarily lead to increased green innovation, which could indicate a disconnect between market anticipation and environmental concerns in these firms.

H12 (RISK -> GREEN) is not supported: the lack of support for this hypothesis suggests that managers' willingness to make risky commitments does not directly translate into more green innovation, which could imply that Italian SMEs do not perceive green initiatives as particularly risky, or that other factors are more influential in driving green innovation.

6. Conclusions

This study provides significant theoretical and empirical contributions to understanding the relationships between intellectual capital (IC), entrepreneurial orientation (EO) and green innovation in Italian SMEs. Our findings contribute to the growing body of literature exploring the interplay between these variables, offering new perspectives and insights.

In line with previous studies (e.g., Yaseen et al., 2023), our findings reinforce the critical role of Intellectual Capital (IC) in fostering Entrepreneurial Orientation (EO) dimensions, namely innovativeness, proactiveness and risk-taking. IC emerges as a vital enabler of entrepreneurial behaviours and

strategic innovation, underscoring its value as a core resource for organisations seeking to adapt and thrive in dynamic markets (Yaseen et al., 2023; Al-Omoush, 2021). However, our study delves deeper into these dynamics by demonstrating that the various components of IC—human capital, relational capital and structural capital—differentially influence EO dimensions. Among these, structural capital stands out as a key driver, significantly affecting all three dimensions of EO. This finding extends the existing literature on structural capital (Beltramino et al., 2020; Al-Omoush, 2021) by emphasising the importance of organisational processes, codified knowledge and robust knowledge management systems in enhancing creativity, forward-looking strategies and the willingness to embrace risk in Italian SMEs.

Our study also adds to the ongoing discourse on the connection between EO and green innovation (Wang et al., 2023). While previous research has broadly highlighted the role of EO in fostering sustainability initiatives, our findings nuance this understanding by showing that innovativeness is the only EO dimension with a significant positive impact on green innovation in Italian SMEs. Creativity, experimentation and the development of new products and services appear to be the cornerstone of sustainable innovation, enabling firms to meet environmental challenges and align with global sustainability trends. In contrast, proactiveness and risk-taking, although integral to broader entrepreneurial activities, do not exhibit a direct influence on green innovation. This deviation from earlier findings (e.g., Yan et al., 2021) suggests that, in the context of Italian SMEs, green innovation may depend more on cultivating a culture of creativity and experimentation than on anticipatory market actions or high-risk investments.

These findings have significant managerial implications for small and medium-sized enterprise (SME) managers, highlighting actionable steps to enhance both entrepreneurial orientation (EO) and green innovation. For SME managers, they underscore the critical importance of investing in structural capital—the systems, processes and knowledge infrastructure that provide a foundation for organisational agility and entrepreneurial behaviour. By establishing and refining robust organisational processes and information management systems, managers can create an environment where innovation thrives, proactive strategies are effectively implemented and calculated risk-taking is supported. These systems not only streamline decision-making but also enable teams to respond quickly to changes in the market and capitalise on emerging opportunities.

Moreover, the findings stress the need for embedding a culture of creativity and experimentation within SMEs. This involves more than just encouraging employees to think outside the box; it requires creating mechanisms for idea generation, evaluation and implementation. Managers can achieve this by investing in research and development, providing training that fosters innovative thinking, and ensuring that organisational

structures support collaboration and knowledge sharing. Such a culture is pivotal for driving green innovation, where creativity is often required to develop sustainable products and processes that meet evolving environmental standards and customer expectations.

Additionally, managers should integrate sustainability goals into their strategic planning and innovation efforts. The strong link between innovativeness and green innovation indicates that advancing environmental sustainability is not merely a compliance activity but an opportunity for competitive advantage. By aligning sustainability with innovative objectives, managers can ensure that resources are channeled into projects that deliver both environmental and business value. Initiatives such as leveraging renewable energy, reducing waste and adopting environmentally friendly materials can be prioritised within innovation strategies to achieve measurable green outcomes.

Finally, managers should focus on building collaborative networks with external stakeholders, including suppliers, customers and industry partners. These relationships can amplify the impact of structural capital and foster shared innovation that addresses broader environmental challenges. By cultivating trust and partnerships, SMEs can access external knowledge, share risks and co-develop sustainable solutions, enhancing their ability to innovate and maintain a competitive edge in the green economy. Together, these strategies position SMEs not only as agile and innovative players in their industries but also as leaders in advancing environmental sustainability.

The main limitation of this study is that we gathered data from SMEs operating in a single European country, and results cannot be generalised.

This study also opens up new avenues for future research. Firstly, it would be interesting to explore whether these findings are generalisable to other national contexts, or if they are specific to Italian SMEs. Secondly, longitudinal studies could provide insights into how these relationships evolve over time, especially in response to changes in the economic or regulatory environment. Finally, future research could delve deeper into the specific mechanisms through which entrepreneurial orientation translates intellectual capital into green innovation, possibly exploring the role of additional mediating or moderating variables.

In conclusion, this research contributes to advancing our understanding of how intellectual capital and entrepreneurial orientation can drive green innovation in small and medium-sized enterprises, offering a foundation for both theoretical advancement and practical application in the field.

References

Adomako, S. (2018). The moderating effects of adaptive and intellectual resource capabilities on the relationship between entrepreneurial orientation and financial performance. *International Journal of Innovation Management*, 22(03), 1850026.

Agostini, L., Nosella, A., & Filippini, R. (2017). Does intellectual capital allow improving innovation performance? A quantitative analysis in the SME context. *Journal of Intellectual Capital*, *18*(2), 400-418.

Ahmed, S.S., Guozhu, J., Mubarik, S., Khan, M. and Khan, E. (2020). Intellectual capital and business performance: the role of dimensions of absorptive capacity. *Journal of Intellectual Capital*, Vol. 21 No. 1, pp. 23-39.

Ali, W., Wen, J., Hussain, H., Khan, N. A., Younas, M. W., & Jamil, I. (2021). Does green intellectual capital matter for green innovation adoption? Evidence from the manufacturing SMEs of Pakistan. *Journal of Intellectual Capital*, 22(5), 868-888.

Al-Omoush, K.S. (2021). Understanding the impact of intellectual capital on E-business entrepreneurial orientation and competitive agility: an empirical study. *Information Systems Frontiers*, Vol. 24, pp. 549-562.

Alshahrani, M. A., Yaqub, M. Z., & Alabdali, M. A. (2024). Examining the role of intellectual capital in maturing sustainable competitive advantage through enkindling innovations in SMEs: the moderating role of entrepreneurship-orientation. *Journal of Intellectual Capital*.

Awan, F. H., Dunnan, L., Jamil, K., & Gul, R. F. (2023). Stimulating environmental performance via green human resource management, green transformational leadership, and green innovation: a mediation-moderation model. *Environmental Science and Pollution Research*, 30(2), 2958-2976.

Bansal, S., Garg, I., Jain, M., & Yadav, A. (2023). Improving the performance/competency of small and medium enterprises through intellectual capital. *Journal of Intellectual Capital*, *24*(3), 830-853.

Basbeth, F., Ramli, A., Razik, M. A. B., Zain, R. M., & Nawi, N. B. C. (2019). The role of multi dimensional EO in the competitive strategy-performance link. *Research in World Economy*, 10(2), 20-25.

Becker, J.-M., Klein, K., & Wetzels, M. (2012). Hierarchical latent variable models in PLS-SEM: Guidelines for using reflective-formative type models. *Long Range Planning*, 45(5-6), 359-394.

Bellucci, M., Marzi, G., Orlando, B., & Ciampi, F. (2021). Journal of Intellectual Capital: a review of emerging themes and future trends. *Journal of Intellectual Capital*, *22*(4), 744-767.

Beltramino, N. S., García-Perez-de-Lema, D., & Valdez-Juárez, L. E. (2020). The structural capital, the innovation and the performance of the industrial SMES. *Journal of Intellectual Capital*, 21(6), 913-945.

Bontis, N. (2001). Assessing knowledge assets: a review of the models used to measure intellectual capital. *International journal of management reviews*, 3(1), 41-60.

Bontis, N., Ciambotti, M., Palazzi, F., & Sgro, F. (2018). Intellectual capital and financial performance in social cooperative enterprises. *Journal of Intellectual Capital*, 19(4), 712-731.

Buenechea-Elberdin, M., Sáenz, J., & Kianto, A. (2017). Exploring the role of human capital, renewal capital and entrepreneurial capital in innovation performance in high-tech and low-tech firms. *Knowledge Management Research & Practice*, 15, 369-379.

Cabrilo, S., & Dahms, S. (2020). The role of multidimensional intellectual capital and organizational learning practices in innovation performance. *European Management Review*, 17(4), 835-855.

Cabrilo, S., & Grubic-Nesic, L. (2013). The role of creativity, innovation, and invention in knowledge management. In Knowledge management innovations for interdisciplinary education: Organizational applications (pp. 207-232). *IGI Global*.

Cai, W., & Li, G. (2018). The drivers of eco-innovation and its impact on performance:

Evidence from China. Journal of Cleaner Production, 176, 110-118.

Cattafi, G., Del Pozzo, A., & Nicolò, D. (2023). People first! Intellectual capital and growth of high-growth social cooperatives (social gazelles) in the startup stage. Evidence from Italy. *Piccola Impresa/Small Business*, (1).

Chang, C. H. (2011). The influence of corporate environmental ethics on competitive advantage: The mediation role of green innovation. *Journal of business ethics*, 104, 361-370.

Chaudhary, S., Dhir, A., Farronato, N., Nicotra, M., & Pironti, M. (2023). Nexus between entrepreneurial orientation and intellectual capital. *Journal of Intellectual Capital*, 24(1), 70-114.

Chen, C.J., Liu, T.C., Chu, M.A. and Hsiao, Y.C. (2014). Intellectual capital and new product development", Journal of Engineering and Technology Management, Vol 33, pp 154-173.

Ciambotti, G., Sgrò, F., Bontis, N., & Zaccone, M. C. (2023). Opportunity recognition and exploitation in resource-scarce contexts: the role of relational capital and bricolage in African social enterprise. *Knowledge Management Research & Practice*, 21(6), 1124-1136.

Cooper, C., Pereira, V., Vrontis, D., & Liu, Y. (2023). Extending the resource and knowledge-based view: Insights from new contexts of analysis. *Journal of Business Research*, 156, 113523.

Costa, R., Menichini, T., & Salierno, G. (2022). Do SDGs really matter for business? Using GRI sustainability reporting to answer the question. *European Journal of Sustainable Development*, *11*(1), 113-113.

Crupi, A., Cesaroni, F., & Di Minin, A. (2021). Understanding the impact of intellectual capital on entrepreneurship: a literature review. *Journal of Intellectual Capital*, 22(3), 528-559.

Dabić, M., Vlačić, B., Scuotto, V., & Warkentin, M. (2021). Two decades of the Journal of Intellectual Capital: a bibliometric overview and an agenda for future research. *Journal of Intellectual Capital*, *22*(3), 458-477.

Dangelico, R. M., Pujari, D., & Pontrandolfo, P. (2017). Green product innovation in manufacturing firms: A sustainability□oriented dynamic capability perspective. *Business strategy and the Environment*, 26(4), 490-506.

Demartini, M. C., & Beretta, V. (2022). Intellectual capital in SMEs: a review and research agenda. *International Journal of Learning and Intellectual Capital*, *19*(1), 5-29.

Demartini, P., Cesaroni, F. M., Del Baldo, M., & Paoloni, P. (2017). Entrepreneurial, renewal capitals and financial performance. Evidences from an international research project. *Piccola Impresa/Small Business*, (2).

Fernando, Y., Jabbour, C. J. C., & Wah, W. X. (2019). Pursuing green growth in technology firms through the connections between environmental innovation and sustainable business performance: does service capability matter?. *Resources, conservation and recycling*, 141, 8-20.

Freixanet, J., Braojos, J., Rialp-Criado, A., & Rialp-Criado, J. (2021). Does international entrepreneurial orientation foster innovation performance? The mediating role of social media and open innovation. *The International Journal of Entrepreneurship and Innovation*, 22(1), 33-44.

Galdeano-Gómez, E., Aznar-Sánchez, J. A., & Pérez-Mesa, J. C. (2013). Sustainability dimensions related to agricultural-based development: the experience of 50 years of intensive farming in Almería (Spain). *International Journal of Agricultural Sustainability*, 11(2), 125-143.

Garcia-Perez, A., Ghio, A., Occhipinti, Z., & Verona, R. (2020). Knowledge management and intellectual capital in knowledge-based organisations: a review and theoretical perspectives. *Journal of Knowledge Management*, 24(7), 1719-1754.

Giampaoli, D., Sgrò, F., Ciambotti, M. and Bontis, N. (2024). Integrating knowledge management with intellectual capital to drive strategy: a focus on Italian SMEs. *VINE Journal of Information and Knowledge Management Systems*, Vol. 54 No. 1, pp. 22-42.

Hair, J. F., Jr., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling* (PLS-SEM) (2nd ed.). Thousand Oaks, CA: Sage.

Han, J., Han, J., & Brass, D. J. (2014). Human capital diversity in the creation of social

capital for team creativity. *Journal of organizational behavior*, 35(1), 54-71.

Hanifah, H., Abd Halim, N., Vafaei-Zadeh, A., & Nawaser, K. (2022). Effect of intellectual capital and entrepreneurial orientation on innovation performance of manufacturing SMEs: mediating role of knowledge sharing. *Journal of Intellectual Capital*, *23*(6), 1175-1198.

Henseler, J., Ringle, C.M. and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modelling. *Journal of the Academy of Marketing Science*, Vol. 43 No. 1, pp. 115-135.

Hock-Doepgen, M., Clauss, T., Kraus, S., & Cheng, C. F. (2021). Knowledge management capabilities and organizational risk-taking for business model innovation in SMEs. *Journal of business research*, 130, 683-697.

Inkinen, H. (2015). Review of empirical research on intellectual capital and firm performance. *Journal of Intellectual capital,* 16(3), 518-565.

Johl, S. K., & Toha, M. A. (2021). The nexus between proactive eco-innovation and firm financial performance: a circular economy perspective. *Sustainability*, 13(11), 6253.

Khalique, M., Yaacob, M. R. B., Rahman, M. K., & Adeiza, A. (2022). Effect of intellectual capital on the business performance of SMEs in Malaysia. *International Journal of Learning and Intellectual Capital*, 19(3), 257-268.

Khedhaouria, A., Gurău, C., & Torrès, O. (2015). Creativity, self-efficacy, and small-firm performance: The mediating role of entrepreneurial orientation. *Small Business Economics*, 44(3), 485-504.

Kianto, A., Sáenz, J., & Aramburu, N. (2017). Knowledge-based human resource management practices, intellectual capital and innovation. *Journal of Business Research*, 81, 11-20.

Lin, H., Zeng, S. X., Ma, H. Y., Qi, G. Y., & Tam, V. W. (2014). Can political capital drive corporate green innovation? Lessons from China. *Journal of cleaner production*, 64, 63-72.

Lumpkin, G. T., & Lichtenstein, B. B. (2005). The role of organizational learning in the opportunity–recognition process. *Entrepreneurship theory and practice*, 29(4), 451-472.

Madhoushi, M., Sadati, A., Delavari, H., Mehdivand, M., & Mihandost, R. (2011). Entrepreneurial orientation and innovation performance: The mediating role of knowledge management. *Asian journal of business management*, 3(4), 310-316.

Marco-Lajara, B., Zaragoza-Sáez, P. C., Martínez-Falcó, J., & Sánchez-García, E. (2023). Does green intellectual capital affect green innovation performance? Evidence from the Spanish wine industry. *British Food Journal*, 125(4), 1469-1487.

Martínez-Ros, E., & Kunapatarawong, R. (2019). Green innovation and knowledge: The role of size. *Business Strategy and the Environment*, 28(6), 1045-1059.

Matarazzo, M., Oduro, S., & Gennaro, A. (2024). Stakeholder engagement for sustainable value co-creation: Evidence from made in Italy SMEs. *Business Ethics, the Environment & Responsibility*.

Miao, C., Coombs, J.E., Qian, S. and Sirmon, D.G. (2017). The mediating role of entrepreneurial orientation: a meta-analysis of resource orchestration and cultural contingencies. *Journal of Business Research*, Vol. 77 August, pp. 68-80.

Modaffari, G., Paoloni, N., & Manzo, M. (2023). Intellectual capital's contribution to innovative female agri-start-ups: a multiple case study. *Journal of Intellectual Capital*, *24*(6), 1506-1531.

Nogueira, E., Gomes, S., & Lopes, J. M. (2022). The key to sustainable economic development: A triple bottom line approach. Resources, 11(5), 46.

Palazzi, F., Sgrò, F., Ciambotti, M., & Bontis, N. (2020). Technological intensity as a moderating variable for the intellectual capital–performance relationship. *Knowledge and Process Management*, *27*(1), 3-14.

Paoloni, M., Coluccia, D., Fontana, S., & Solimene, S. (2020). Knowledge management, intellectual capital and entrepreneurship: a structured literature review. *Journal of Knowledge Management*, 24(8), 1797-1818.

Paoloni, P., Demartini, P., Cesaroni, F. M., & Del Baldo, M. (2015). Entrepreneurial and

renewal capital of finnish and italian firms: insights from an empirical study. *International Journal of Management, Knowledge and Learning*, *4*(1), 69-89.

Paoloni, P., Modaffari, G., Ricci, F., & Della Corte, G. (2023). Intellectual capital between measurement and reporting: a structured literature review. *Journal of Intellectual Capital*, 24(1), 115-176.

Pérez-Luño, A., Wiklund, J., & Cabrera, R. V. (2011). The dual nature of innovative activity: How entrepreneurial orientation influences innovation generation and adoption. *Journal of business Venturing*, 26(5), 555-571.

Rahman, S. A., Taghizadeh, S. K., Khan, G. M., & Radomska, M. (2024). Intellectual capital and competitiveness improvement among micro-small-medium enterprises: A resource orchestration view. *Journal of Small Business and Enterprise Development*, 31(1), 45-67.

Rauch, A., Wiklund, J., Lumpkin, G.T. and Frese, M. (2009). Entrepreneurial orientation and business performance: an assessment of past research and suggestions for the future. *Entrepreneurship Theory and Practice*, Vol. 33 No. 3, pp. 761-787.

Riahi‐Belkaoui, A. (2003). Intellectual capital and firm performance of US multinational firms. *Journal of Intellectual capital*.

Sánchez-Sellero, P., & Bataineh, M. J. (2022). How R&D cooperation, R&D expenditures, public funds and R&D intensity affect green innovation?. *Technology Analysis & Strategic Management*, 34(9), 1095-1108.

Sentuti, A., Sgrò, F., Chamochumbi Diaz, G. D., Palazzi, F., & Ciambotti, M. (2020). The management process underpinning the non-financial reporting: A case study of a listed Italian company. *Accounting, Accountability and Society: Trends and Perspectives in Reporting, Management and Governance for Sustainability*, 19-42.

Sgrò, F. (2021). Intellectual Capital And Organizational Performance: An Empirical Focus On Social Cooperative Enterprises. In SIDREA Springer Series in Accounting and Business Administration. SIDREA Springer, ISBN: 9783030784782, doi: 10.1007/978-3-030-78479-9

Shahzad, M., Qu, Y., Javed, S. A., Zafar, A. U., & Rehman, S. U. (2020). Relation of environment sustainability to CSR and green innovation: A case of Pakistani manufacturing industry. *Journal of Cleaner Production*, 253, 119938.

Swink, M. (2003). Completing projects on-time: How project acceleration affects new product development. *Journal of Engineering and Technology Management*, 20(4), 319–344.

Thomas, A., Scandurra, G., & Carfora, A. (2022). Adoption of green innovations by SMEs: An investigation about the influence of stakeholders. *European Journal of Innovation Management*, *25*(6), 44-63.

Vézina, M., Ben Selma, M., & Malo, M. C. (2019). Exploring the social innovation process in a large market based social enterprise: A dynamic capabilities approach. *Management Decision*, 57(6), 1399-1414.

Wales, W., Gupta, V.K., Marino, L. and Shirokova, G. (2019). Entrepreneurial orientation: international, global and cross-cultural research. *International Small Business Journal*, Vol. 37 No. 2, pp. 95-104.

Wales, W.J., Kraus, S., Filser, M., Stockmann, C. and Covin, J.G. (2021). The status quo of research on entrepreneurial orientation: conversational landmarks and theoretical scaffolding. *Journal of Business Research*, Vol. 128, pp. 564-577.

Wang, C., Zhang, X. E., & Teng, X. (2023). How to convert green entrepreneurial orientation into green innovation: The role of knowledge creation process and green absorptive capacity. *Business Strategy and the Environment*, 32(4), 1260-1273.

Weng, H. H., Chen, J. S., & Chen, P. C. (2015). Effects of green innovation on environmental and corporate performance: A stakeholder perspective. *Sustainability*, 7(5), 4997-5026.

Yan, X., Zhang, Y., & Pei, L. L. (2021). The impact of risk-taking level on green technology innovation: Evidence from energy-intensive listed companies in China. *Journal of Cleaner Production*, 281, 124685.

Yaseen, S. G., El Qirem, I., Nussair, M., & Sa'd, H. (2023). Intellectual capital components

and entrepreneurial orientation: the mediating role of absorptive capacity. *Business Process Management Journal*, 29(7), 2129-2146.

Youndt, M. A., & Snell, S. A. (2004). Human resource configurations, intellectual capital, and organizational performance. *Journal of managerial issues*, 337-360.

APPENDIX

HUMAN CAPITAL
In my organisation…

1. employees are highly skilled in their tasks
2. employees have a lot of experience in their job
3. employees are good at problem-solving

RELATIONAL CAPITAL
In my organisation

1. We exchange information with external parties (e.g. customers and suppliers) in a very effective way
2. We collaborate extensively with external parties (e.g. customers and suppliers) to develop new solutions
3. We collaborate with external parties (e.g. customers and suppliers) in a very effective way

STRUCTURAL CAPITAL
My organisation…

1. has a lot of useful information in documents and databases
2. has an effective management system to meet the needs of our clients/consumers.
3. has technology to integrate internal work processes tightly

INNOVATIVENESS
My organisation…

1. introduced and favoured many product or service innovations
2. marketed very many new lines of products or services
3. made major changes in product or service lines offered

RISK-TAKING
In my organisation…

1. we tend to strongly favour high-risky projects (with chances of very high returns)
2. Owing to the nature of the environment, we favour bold and wide-ranging acts to achieve the company's objectives
3. we typically adopt a bold and aggressive posture in order to maximise the probability of exploiting potential opportunities