



Do entrepreneurial orientation and intellectual capital influence SMEs' growth? Evidence from Pakistan

Muhammad Ghazanfar Abbas¹ · Zhuquan Wang¹ · Hafeez Ullah¹ · Muhammad Mohsin² · Hasnain Abbas³ · Memon Rafait Mahmood¹

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Abstract

This research analyzes the impacts of intellectual capital (IC) and the balancing power of entrepreneurial orientation (EO) on innovation growth (IG) in Pakistan's SME sector. A quantitative approach on smart PLS has been applied through the SEM model, backed by a survey to gather primary data from 256 participants of Pakistan's SME sector. A significant effect of human capital on Pakistani firms' IG was identified. In contrast, the effect of structural capital was determined to be insignificant over the IG of Pakistani firms. On the other hand, the customer capital's effect was also significant over Pakistani firms' innovation growth. Little moderation of EO between human capital and IG has been determined. The moderations of "EO between human capital and innovation growth" and "EO between structural capital and innovation growth" were insignificant. However, the moderation of EO between customer capital and IG was significant. The scope of this study is limited to firms in Pakistan and can be extended to firms in other regions, which can provide broad findings.

Keywords Intellectual capital · Human capital · Structural capital · Customer capital · Innovation growth · Entrepreneurial orientation

Introduction

Firm competition has been increasing due to increased globalization, making businesses more creative and competitive in the modern market. In this context, businesses must innovate to outperform their competitors and improve their results (Ullah et al. 2021a; Lin et al., 2013; Rehman et al. 2021). Innovation also applies to intellectual capital (IC) since it helps a business generate wealth and highly valued assets. A business must be viewed as a social community that focuses on productivity, information transferred rate, and development. Despite the importance of financial health, businesses need to prioritize operational metrics, such as defect rates and cycle time, which would also boost financial measures (Kaplan and Norton, 2005; Erixon, 2018; Al-Tal and Emeagwali 2019). In consistently growing industries, IC inspires transformation, stability, and success (Liesegang and Runkel 2017), and it is a positive measure of a company's effectiveness in a knowledge-based economy (Dagan, 2017). On the other hand, it is effectively incorporated into the company's actions and points to the advancement of extremely innovative or rare services, products, or

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✉ Hafeez Ullah
hafeezullah@stu.ouc.edu.cn; hafeez.2017@hotmail.com

Muhammad Ghazanfar Abbas
m.ghazni@live.com

Zhuquan Wang
zhuquanw@ouc.edu.cn

Muhammad Mohsin
m.mohsin3801@yahoo.com

Hasnain Abbas
hasnainabbas354@yahoo.com

Memon Rafait Mahmood
rafaitm@outlook.com

¹ College of Management, Ocean University of China, 238 Songling Road, Qingdao 266100, Shandong, People's Republic of China

² School of Finance and Economics and Jiangsu University, Zhenjiang, China

³ School of Economics and Management, Southeast University, Nanjing 210096, China

production methods and their strengths (Wang et al. 2020; Zhou et al., 2019).

This research includes technical knowledge and knowledge gained and stored in external relationships between employees, suppliers, and customers. Businesses face intense competition because of globalization and the constant advancement of technology. As a result, they must evolve their technologies and structures to remain sustainable. This principle is especially applicable to industries such as IT, which must constantly innovate to remain relevant. Hence, it is advantageous for the firm to form alliances for new services and products to realize innovation through IC. The extreme competition needs more strategic collaborations, active information management, and technology-based IC.

In addition, the benefit and significance of technology when looking at innovation are undoubtedly greater. Businesses face more challenges in preserving their competitive position due to better technology and systems (Khan et al. 2021; Graetz and Doud, 2013; Hasan et al. 2019). These difficulties are even greater for SMEs. Hence, these businesses stand out in competition through innovative products, services, and processes (Dagan, 2017; Liesegang and Runkel, 2018). In today's highly competitive and challenging business environment, IC is a critical resource for greater consistency (Zhang et al. 2019). Researchers have studied this phenomenon thoroughly (Ullah et al. (2021b); KiJung and Park (2015); Zhou et al. (2019)). Nonetheless, a company's IC is low when employees are not original or inventive, as they are the most significant determinant of a firm. The concept of IC mainly portrays information or knowledge in various modes and is dedicated to advancing its innovation process and path.

The role of IC can be considered an abstract asset for a business in encouraging organizational innovation (Boso et al. 2013). It improves positively when the leadership adopts the processes inclined towards innovating, which is why Survilaitė et al. (2015) highlight a rise in the requirement of a positive atmosphere, methods, and powerful management with an improved innovation quotient. Various studies have been conducted in light of this topic's recent development based on the incident above. For example, Alzuod et al. (2017) outlined the case of Jordan. However, Pakistan's potential IC area has not been examined yet. In Pakistan's case, Barkat et al. (2018) studied the textile industry and examined the extent of agreement between organizations' performance and IC with innovation potential as brokers.

Nonetheless, none of the pre-existing studies studied the moderating impact of entrepreneurial orientation (EO) of Pakistani SMEs, cultivating the requirement to analyze IC and its moderating impact on innovation in entrepreneurship. In this context, this work assesses Pakistani SMEs'

operations. This study also determines the importance of the businesses engaging in the Pakistani market, especially SMEs, to highlight IC, EO, IG, and other associated aspects.

SMEs in Pakistan are an essential resource boosting the annual GDP by 40%, as they entail 90% of the country's total business and provide 80% of the total employment (Kroh et al. 2018). Hence, the analysis of this sector is imminent. In this context, different studies have considered different IC-related factors, where the most debated ones are human capital (HC), structural capital (SC), and relational capital (RC) (Bianchi et al. 2015). It has been determined that customers and management are vital collaborators in a business (Cui et al. 2018 and Sisay, 2016).

Nonetheless, this study focuses on SC, HC, and customer capital (CC), which complements the importance of variables like IC, IG, and EO collectively while positively adding to the literature. Besides, the SMEs' strategic focus will also improve in light of this study's findings, and it will also benefit future research in this industry. Additionally, this study will play a positive role in determining IC's influence on IG and examining EO's moderating effect among the variables mentioned above. Finally, the study recommends future policy on promoting business innovation in Pakistan's SME sector. This study investigates the following research question:

What is the effect of IC on IG and the moderating effect of EO on IG with the initiated aspects of IC in Pakistan's SMEs?

The rest of the paper is formulated as follows: the second section consists of a theoretical foundation and hypothesis formulations; the third section outlines the plan and methodology; the fourth section explains the results and analysis; and the fifth section highlights the conclusion and policy-level impact.

Theoretical foundation and hypothesis formulation

Academicians have widely evaluated the relationship between IC, EO, and IG. Several studies like Z. Wang et al. (2020), Survilaitė et al. (2015), Alzuod et al. (2017), Barkat et al. (2018), and Rosińska-Bukowska (2019) have outlined employees' knowledge, capability, creativity, and experience as origins of innovation. However, Ullah et al. (2021c) proposed that the positive relationship between IC, EO, and IG might not hold for every scenario. Occasionally, a company's workforce prefers to safeguard its initial processes rather than advancing ideas. In this regard, Asim and Sorooshian (2019) portrayed a negative association between IC, EO, and IG, arguing that specialists might not be open to sharing their concepts with other workforce members due to the fear that their behavior or already established methods would

change. This hesitation constrains an organization from utilizing highly innovative outcomes. Scholars’ disagreement about the impact of IC on IG has resulted in various distinct approaches to consider such collection patterns (Fig. 1).

Innovation growth (IG)

Innovation growth is a widely debated phenomenon due to high market competition, which drives companies to differentiate their goods and services from competitors (Campanella et al. 2014). It depends on a business’s capability to evolve and change according to the market’s universal conditions (Aramburu and Sáenz 2011). Management derived from corporate governance promotes IG with managerial decisions, and incorporating technology (Lin 2018). Besides, Asim and Sorooshian (2019) verified that a boost in innovation could be linked to their products and services, whereas the business can transform processes. Primarily, innovation development improves services or products (Uribe-Echeberria et al. 2019).

Nonetheless, a vast number of studies consider the causes of IG (Lazarenko 2019). Of all the different variables, including environmental, management, and other factors, IC has the most significant impact on any business’s degree of innovation (Kroh et al. 2018). Profits and revenues are the main drivers of a business (Ahlstrom 2010). A business’s focus on innovation does not guarantee that the business will be profitable. In contrast, the innovative method can offer businesses long-term advancement and profits (Björklund, 2018); Arsawan (2019) outlined the requirement and utility of innovation and pointed out the significant relationship between economic growth and innovation. The research also states that innovation is a significant source from a business point of view and established an association between business growth and innovation, pointing towards the evolving

business aspects and increased competition among players. Martinez et al. (2017) consider innovation a vital resource to compete and grow a business, but the growth depends on the industry, technology, and business type.

Based on the debate above, it can be stated that technology contributes significantly towards leading the innovation process. The array of forms, such as companies’ size and organizational level variations, is essential in business growth led by innovation. It is important to understand the organizational level variations in technical capability, business size, adoption of technology, and other aspects. These variations in the organizational level indicate how the innovation process is carried out within the company. Additionally, it has also been discovered that large firms should achieve or seek innovation while they are in the mature stage of their product life cycle to nurture the process of product innovation (Cederholm Björklund 2018). Nonetheless, in smaller organizations, the recommendation is to seek product innovation at the radical stage. Hence, it is important to consider business characteristics like size and technology adaptability when examining innovation influence on a firm’s growth (Rubalcaba et al. 2012).

Intellectual capital

Wang et al. (2019) concluded that intellectual capital is a vital origin in competitive advantage. Nonetheless, most firms do not fully understand the idea’s real value. The study pointed to IC as a way intellectual capability and knowledge assist in building organizational value. It has also been argued that IC is a significant competitive advantage that nurtures employees’ strengths and accessible knowledge in building the intellectual assets for wealth, knowledge, competition, and learning capability, which are all seen as

Fig. 1 Hypotheses formulations



significant sources of achieving competition (Ullah et al. 2015; Wang et al. 2020; Wu and Sivalogathan 2013).

Khan et al. (2021) discovered that IC could be knowledge-controlled and relevant to the business. It is also considered as the overall structure of capital and knowledge-dependent resources under the organization's control. Alternatively, the idea of IC or intellectual assets can also be described as the transfer of knowledge. Furthermore, IC is associated with the supply of knowledge available at a given point in time (Shih et al. 2010).

This idea also helps a business enhance organizational flows and other management processes (Halim 2010). IC has been marked off in Della Torre et al. (2017) as the particular asset of organizational capital that is physical, for example, human intellect, relations, or intellectual properties (IPs). Various researchers have considered varying aspects of the IC like HC, SC, relational capital (RC), or CC (Al Ziadat 2015; and Ahmad and Abazeed 2017).

According to Soheyli et al. (2014), HC is a skill set of a company's employees who play a strategic role in improving productivity, where employee experience and performance also play a role. That is because the employees' enhanced skills and experience increase their productivity and contribute to the company's development. According to Stewart and Capital (1997), human capital denotes the ability and expertise of employees. An organization educating its workers increases its human capital. In this way, the organization will improve employees' creative actions with increased human capital, contributing to its innovation growth. Nieves and Quintana (2018) also argued that human capital has a significant effect on the company's innovative growth. Therefore, the first hypothesis tests human capital's effect on Pakistani firms' innovative growth. This hypothesis has been provided below:

H1: The effect of HC on IG is significant and positive.

Dost et al. (2016) addressed the definition of structural capital by verifying that SC creates instances supporting HC in a business. In other words, despite the variations in a company's staff, the structural assistance is constant. In contrast, the effects of intellectual practices in information and records or documents are also included in the systemic wealth (Stewart and Capital, 1997). Information, architecture, system, data, and processes in the company are involved in structural resources. It, therefore, plays a vital role in terms of product, service, or process advancement for the company's ability. Dabić et al. (2019) argue that structural capital plays a significant role in its creative growth. The second hypothesis was thus established to test the impact of structural capital on Pakistani firms' innovative results, which is as follows:

H2: The effect of SC on IG is significant and positive.

Customer capital can be defined as the relationship balance between companies and consumers that encourages customers to buy from the same company regularly and attracts customers to provide input to the company to support them, which can improve the company's financial and IG performance (Joia and Malheiros, 2009). The relationship between customer capital and firm innovation has been explored by Jahanshahi et al. (2019). Researchers assessed that the business's ability to access market information, including changes in consumer and market patterns, competition, and technology changes, is critical for its innovativeness. By maintaining close relationships with customers, businesses can discover customer requirements and even foresee potential undefined customer requirements by new approaches faster than their rivals. Therefore, CC strengthens the companies' marketing capability and lets companies respond quickly to the customer's requirements.

Due to the acceleration of information processing within organizations, CC will increase the creativity of businesses. Through CC, organizations can maintain an ongoing relationship with their environment, especially their customers, enabling them to understand better viewpoints and consumer values that help them recognize customer expectations and demands. Businesses can meet these new demands through innovative products and services (Huggins, Johnston, and Thompson, 2012). Therefore, the third hypothesis was established to test CC's impact on creative growth in Pakistani companies. It is given below:

H₃: The effect of CC on IG is significant and positive.

Entrepreneurial orientation

Entrepreneurial orientation is another idea portrayed in this research. Alqadi and A'alamat (2018) proposed that EO is a vital idea significantly added when formulating business strategies, regulations, and decision-making, further integrating the business's approach to generic behavior. Ramchander (2019) outlined that EO is the potent variable for a company's strategic advancement. Covin and Wales (2011) also affirm different angles to examine EO, including risk appetite, autonomy, innovativeness, proactive nature, and competitive aggressiveness. Similar studies also exist in the literature (Asiaei and Jusoh 2015). Lerro et al. (2014) established that particular aspects influence SMEs' efficiency, including social and environmental aspects. Besides, Al Ziadat (2015) observed the crucial effects of EO on organizational innovation. Therefore, in SMEs' case, EO, IC, and IG's importance are clear from the literature review (Koul 2018; Terblanche and Pentz 2019).

Varying definitions of EO have been suggested in the literature. Calzolari and Lambertini (2007) described entrepreneurship as an organization's capability to rejuvenate, innovate, and take suitable risks. Additionally, the aim behind entrepreneurship is to evolve creative innovations with value. In the quest to achieve the task above, EO is considered a crucial organizational process, which contributes significantly to the company's sustainability and efficiency. Also, EO's idea has been associated with novel strategies for entry when businesses must build, innovate, and commercialize new services and products through existing resources.

Wendra et al. (2019) also consider EO and link the idea with a company's inclination while moving towards novel market opportunities. This idea focuses on innovating, taking risks, and aggressiveness — essential requirements for venturing into new markets. Alternatively, EO can also be expressed as the chance to explore orientations that are a part of discovering a market and building future benefits of an organization, which can also be associated with innovation, proposing that a business's ability to innovate also increases by venturing into new markets.

Researchers have discussed a vast number of factors leading to IC. Nonetheless, scholars categorize IC into three main groups (i.e., human capital, structural capital, and customer capital) (Nacu and Avasilcai, 2015). Notably, Kianto et al. (2017) also proposed that relational capital can be used conversely with social capital. It has also been pointed out that structural capital and organizational capital are not separate. However, in terms of organizational innovation, the leading factors in line with human, structural, and customer capital have been described often in the research, which is considered significant when approaching organizational innovation and growth.

In the case of IC's effect on innovation, D'Ippolito et al. (2019) looked at the positive impact of IC on innovation in Jordan's market. Han and Li (2015) also discovered the positive impact of IC on innovation efficiency and similar links in the Chinese market while keeping HC, SC, and RC constant Han and Li 2015). According to its definition proposed by the Economic Cooperation and Development (OECD), the innovation mechanism can be described to enforce strategies that target enhancing the services, products, and novel marketing process (Wu et al. 2007). In order to sustain, firms need to effectively manage their innovation (Wu et al. 2007). Moreover, regarding the impact of organizational or structural capital on innovation, the debate offered by Se-Hwa et al. (2007) is credible enough, proposing that organizational or structural capital is vital for keeping human capital. It has also been outlined that structural capital helps firms succeed (Ansari et al. 2016; Joshi et al., 2013; Bose and Oh, 2003).

EO has been described in previous research as one of the most relevant ideas that can lead to the preparation

and growth of business plans, legislation, and the entire decision-making process (Oliveira Junior et al. 2016). Therefore, EO will help incorporate the company's whole strategy and the organizational conduct that happens in the company. Research has shown that EO is an influential variable for a company's success (Rauch et al. 2009). Also, EO's definition can be analyzed and evaluated across various aspects, such as the capacity to take risks, autonomy, creative actions, and competitive nature. Thus, EO has been identified as a factor contributing to new businesses, tiny and medium-sized businesses. Studies have also shown the EO's effect on organizational creativity (Hassim, Asmat-Nizam, and Bakar, 2011). From the empirical point of view, EO, HC, and IG are relevant for companies, particularly for SMEs.

In literature, EO has been described in different ways. The effect of human capital on entrepreneurial organizations that foster creativity has been addressed by Marvel et al. (2016). The fourth hypothesis was developed to evaluate the mediating impact of EO on the relationship between human capital and Pakistani companies' innovative results. It is given as follows:

H4: EO moderates the relationship between HC and IG significantly and positively.

It is essential first to evaluate the idea of entrepreneurship to understand the principles of EO. Entrepreneurship is a company's capacity to develop and take chances. The core concept behind entrepreneurship is that innovative developments within companies must occur, and the business must appreciate these innovations. Researchers have also found that different variables can contribute to IC, although several researchers have split IC's definition into three key categories (Hatane et al. 2018). IC has often been divided in literature into three key factors: IC, institutional capital, and consumer capital. The leading variables have also been identified as an individual, institutional, and client capital in organizational innovation (Muh and ETTY, 2019). Research has found a positive effect when the impact of IC on creativity is investigated (Örnek and Ayas 2015). It is argued that organizational or structural capital is critical for sustaining human capital when the effect of organizational capital or structural capital on innovation is studied. Plus, it is often addressed that structural capital allows businesses to thrive. In this way, the fifth hypothesis was developed to test an entrepreneurial organization's mediating impact on the relationship between structural capital and Pakistani firms' innovative results. It is given as follows:

H5: EO moderates the relationship between SC and IG significantly and positively.

EO is regarded as an essential organizational mechanism that can lead the company to productivity and sustainability. The company can build, innovate, and sell new products using the current market capitalization. EO's definition has also been aligned with the company's preference for new business opportunities (Veidal and Korneliusen 2013). The explanation for this is that the EO model focuses on the business's capacity and ability to develop and take substantial risks, which is a prerequisite for entering new markets.

On the other hand, EO can also be shown as an ability to discover the orientations that are part of exploring the market and thereby reaping the company's potential benefits. The concept is thus related to growth, and it is argued that when a company enters new markets, the potential to innovate often increases. Ugalde-Binda et al. (2014) discuss that customer capital and entrepreneurship should be about creativity and how these variables can serve as drivers of innovation.

The sixth hypothesis was thus developed to assess an entrepreneurial organization's mediating impact on the customer capital relationship and the creative success of Pakistani companies, and it is given as follows:

H6: EO moderates the relationship between CC and IG significantly and positively.

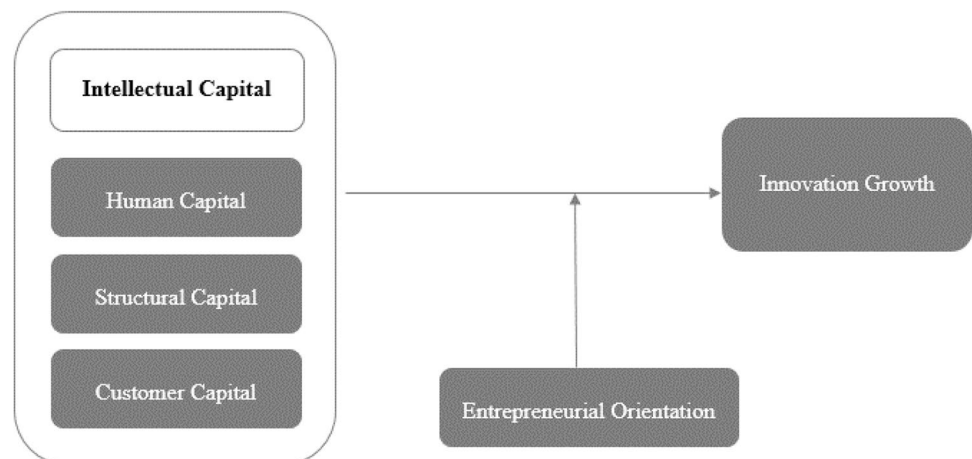
Conceptual framework

This research's conceptual model is highlighted below and is modified from Cuganesan et al. (2009). As depicted in the figure, IC is the independent variable, where three dimensions were considered independently, including HC, SC, and CC. EO is the moderating variable, where the impact has been examined on IG, which is the dependent variable. IC as an element has also been encouraged in research by Sakakibara et al. (2010) (Shashi et al. 2020). Alzuod et al. (2017) formulated the following hypotheses:

- H1: The effect of HC on IG is significant and positive.
 H2: The effect of SC on IG is significant and positive.
 H3: The effect of CC on IG is significant and positive.
 H4: EO moderates the relationship between HC and IG significantly and positively.
 H5: EO moderates the relationship between SC and IG significantly and positively.
 H6: EO moderates the relationship between CC and IG significantly and positively.

Technological development has noticeably evolved a large number of businesses in multiple industries. Firms exist in an environment where they are penetrated mainly by digital technology. It is incorporated at the foundation of the products, services, and operations of many organizations. It is favored as one of the prominent sources contributing to an organization's competitiveness based on innovation. Hence, technological development has, in turn, altered business methods. Alternatively, one can also state that with the onset of technology, there is a clear distinction in case firms that have recognized the significance of technology and are concentrated on adopting technology intelligently and promptly. The reason behind this is also in line with research by Yoo et al. (2012), who proposes the significance and necessity of technology for riding innovation in businesses. The utility of novel technological onset is explained such that the prevalence of digital technology has majorly altered the mood of innovation processes with the results of the innovation. Some important qualities of innovation have been discovered to be linked with technology. These attributes exist in modes like digital platforms' significance and utility, the evolution of innovation classification, and the combined innovation for technology-led innovation (Fig. 2) (Shahzad et al. 2020).

Fig. 2 Conceptual model of the study (source: Ullah et al. (2021a) and Cuganesan et al. (2009))



Research methodology

This section outlines the various aspects of the researcher's methodology. A quantitative design is employed. Abu Hasan and Abdullah (2018) assumed that employing quantitative data offers significant proof to the research, adding to its effectiveness. In light of this, an analytical approach has been used to gauge particular prevalent ideas, which have also been outlined in the prior section's hypotheses. Souleh and Samah (2014) declared that already characterized ideas are primarily examined in deductive studies. Hence, this choice is encouraged in this work. In addition, the study is a case study of Pakistan's SMEs. Moreover, this study adopts the optimism ideology founded on objectivism. The overall justification for employing quantitative data is also encouraged by Aly (2016). On the other hand, the study of Alzuod et al. (2017) also used the SEM model to determine the impact of IC and IP on SMEs in Jordan. Another study by Arshad and Arshad (2018) adopted a similar SEM technique to determine the effect of IC on SMEs' performance in Pakistan.

Data used for this study was collected from managers and employees of various SMEs in Pakistan. Therefore, to perform the analysis, it is essential to determine the required sample size. Fugard (2015), where the adequate sample size was calculated, is considered in this regard:

$$n = \frac{z^2 \times p \times q}{e^2}$$

In the above equation, z represents the z -score, calculated at 1.96, while CI is the confidence interval, fixed at 95%. Additionally, e refers to the error, calculated at 5%, and p is the population variability of 50%. Furthermore, q denotes the population proportion, which has not been considered in the study:

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2} = 384$$

The adequate sample size is determined to be 384, based on the estimate above. Thus, 384 questionnaires were distributed by the prosecutor, out of which 256 were collected. In this study, the sample size used is 256. The scholar initially gave the questionnaire to 384 individuals, where only 256 of the completed questionnaires could be used for the study due to the partial and incomplete answers given in the rest of the questionnaires. In this case, Shakina and Barajas (2015) consider the same sample size; they clarified that structural models' sample size should be 200 or more. For this study, the response rate is 66.66 percent.

Additionally, non-probability convenience sampling was used as the scholar could not access every manager or employee of the considered SME firms. Hence, people in the

scholar's circle were reached, so the sample size is limited. Questionnaires were given out using physical and digital channels. The scholar employed a close-ended survey questionnaire as the testing instrument, which was modified from multiple sources. The variables were pointed out on an existing 5-point Likert scale, spreading from strongly disagree to strongly agree.

As discussed before, three parameters have been used to examine the IC variable, including HC, SC, CC, and EO which has been estimated through five dimensions (Fig. 3). Other variables have also been calculated using various sizes; however, HC has been modified from the study by Abu Hasan and Abdullah (2018), whereas the remaining variables have been readjusted and altered from IC (Table 1). The SEM model was employed with a third-generation technique to recognize the model's inaccuracies.

Results and measurement

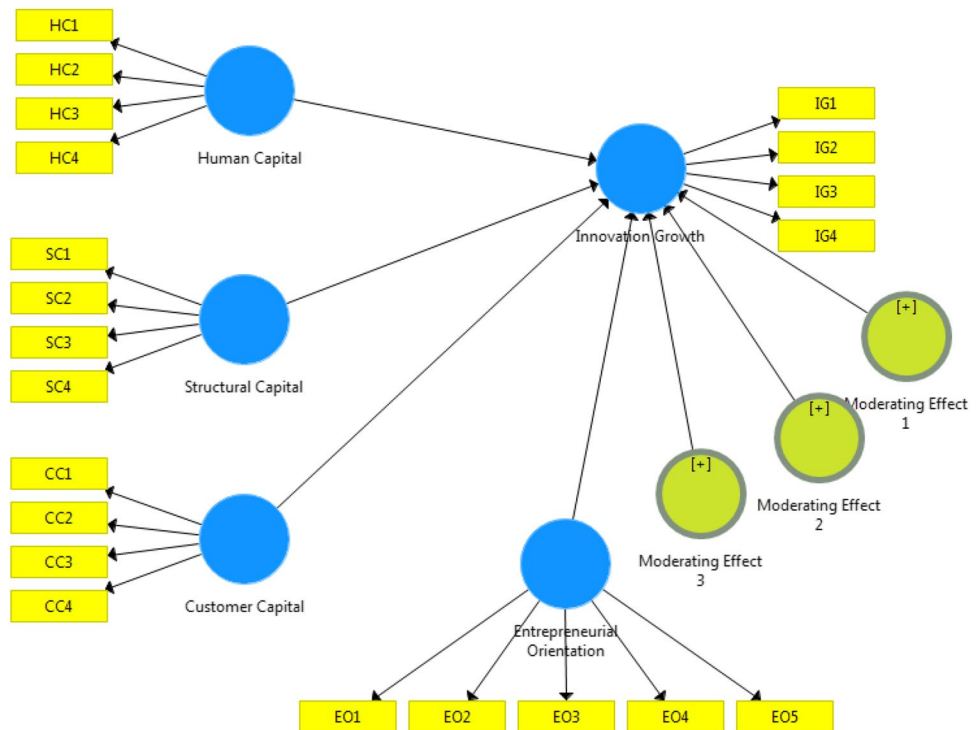
Table 2 describes the participants' sociodemographic characteristics; 66.41% were males, 33.59% were females. Firstly, the demographic analysis has been conducted on the data, where the sample consists of 66.41% males and 33.59% females. Additionally, the highest proportion of the sample was from the age group spreading from 26 to 35 years, making up 39.06%, followed by 36 to 45 years, accounting for 31.64%. In light of this, respondents below 25 years of age make up 19.53%, whereas 46 and older participants make up 9.76%. The sample can be further classified, such that it consists of more participants who are graduates, making up 41.8% where master's degree recipients account for 28.52%; 8.59% are PhDs, and the category of others consists of 18.75%, and ones with intermediate education is at 2.34%. Regarding the employment situation, 57.03% were salaried, 21.48% owned their businesses, and 21.48% were linked with both categories. The graphical results have been outlined.

Table 3 provides descriptive statistics and correlations for all variables. The mean of HC suggests approximately 4.027 (4%) and standard deviation of 0.617 (60%). The mean of SC indicates approximately 4.125 (4%) and standard deviation of 0.587 (59%). The mean of CC is 4.079 (5%), and the standard deviation is 0.643. The mean of the EO suggests that 3.956 and standard deviation 0.758 and finally IG means show 3.899 (4.5%) and its standard deviation 0.621 (62%).

Measurement model

In this study, the structural equation modelling (SEM) technique was used to analyze the data. As per the Martínez-López (2013) report, to analyze the results, SEM is considered the essential technique and is usually followed

Fig. 3 Construct item



for survey response analysis. This analysis consists of two phases: the first concerns confirmatory factor analysis (CFA), while the second discusses the path analysis evaluated through smart PLS. Firstly, the reliability of each variable has been examined by employing Cronbach’s alpha. A study from Alqadi and A’alemat (2018) outlines that the threshold level for the reliability or specificity of Cronbach’s alpha spreads between 0.6 and 0.7. In this instance, the study variables can be acknowledged as reliable, as all alphas are more than 0.6, such that CC has 0.84, EO has 0.86, HC has 0.76, IG has 0.79, and SC has 0.83. In terms of factor loadings, a study by Hair et al. (2016) stated that the acceptable value is 0.7. In contrast, Arifin and Yusoff (2016) referred to an existing survey of Han and Li (2015), where it is outlined that 0.5 is also an acceptable value — Kline (2001) also backs this. Factor loadings have been calculated to be higher than 0.5, hence verifying the convergent validity. In light of this, it is also essential to report the AVE of the model, which should be higher than 0.5 (Table 4) (Ullah, Wang, Bashir, et al., 2021b).

In pursuit of convergent validity, discriminant validity is also essential, which states that variables should be unique. The HTMT ratio has been employed in this research to assess the discriminant validity, which ought to be less than 0.85 as a threshold value. Prevalent with the criteria, the HTMT ratio is seen to be less than 0.85 for each variable in Table 5. Therefore, the variables’ discriminant validity is also found to be suitable to examine the result. Discriminant validity has also been reviewed to analyze the extent of

difference between the two constructs. It portrays that the AVE square root is more relative to every construct’s correlations, uncovering the relationship between IC, EO, and IG for SME performance.

Path coefficient measurement

The researcher of the study conducted bootstrapping to obtain the significance values to assess the path coefficients using the SEM model. The study conducted by Ullah, Wang, Mohsin et al. (2021) stated that bootstrapping can be deemed a resampling technique. The results have been presented in Table 6 and Fig. 4. It can be seen (Table 5) that the effect of human capital is statistically significant and positive on IG of manufacturing companies of Pakistan [$B = 0.380$; p value = $0.000 < 0.01$]. In addition, the effect of structural capital is also statistically positive and insignificant [$B = 0.063$; p value = $0.480 > p$ value] while customer capital also has strongly positive and significant association with innovation growth [$B = 0.186$; p value = 0.019^*]. In furtherance, the moderator, which is EO, is found to have a significant and positive effect [$B = 0.156$; p value = $0.043 < 0.01$] on the sustainability of Pakistan companies. In terms of moderation, EO is insignificantly moderating the association between human capital and structural capital.

Regarding the moderating effect, the relationship between CC and EO has been positive and significant. All the other hypotheses have been proved insignificant. The following table presents the results: it outlines a brief of

Table 1 Construct items

Construct measurement items	Adopted from
Human capital	
HC1: our organization strives for the well-being of employees	Ullah et al. 2021b; Abbas et al., 2021a
HC2: employees are given career development opportunities	
HC3: our organization motivates the employees intrinsically and extrinsically	
HC4: the current level of participation is effective in our organization	Ullah, Wang, Mohsin et al. 2021
Structural capital	
SC1: the cumulative procedure in our organization is effective	Umeair et al. 2020; Shahzad et al. 2021a; Abbas et al. 2021b
SC2: the access to information is easy based on the current system	
SC3: the procedures and systems of our organization are flexible	
SC4: our organizational culture is comfortable and supportive	
Customer capital	
CC1: the customer polls conducted frequently on social media platforms indicate customer satisfaction with our organization	Ullah et al. 2015; Bems 2008; Mohsin et al. 2021; Iqbal et al. 2014
CC2: our organization works for adding positive value to the customer satisfaction and experience	
CC3: our organization is a market-oriented organization	
CC4: our organization strives for getting prompt feedback from the customers for enhancement in the operations	
Entrepreneurial orientation	
EG1: proactiveness to comprehend client's needs drives innovation	Sun et al. 2020; Ullah et al. 2021c; Shahzad et al. 2021c
EG2: a strong emphasis on R&D, technology, and innovation is necessary	
EG3: risk averseness as a rational attitude towards business	
EG4: autonomy is necessary for employees to contribute to the organization to their full potential as per our organization	
EG2: competitive aggressiveness is a driving force in entrepreneurship and in our organization	
Innovation growth	
IG1: the volume of new products and services our organization is producing is increasing with time	Rosińska-Bukowska 2019; Ahmad et al. 2020
IG2: the speed of producing new products and services in the organization is increasing with time	
IG4: the degree of functional improvement and adaptation of new technology is enhancing with time	
IG4: overall, the quotient of innovation achievement is high	

the hypotheses. The study conducted by Hair et al. (2016) acknowledged that the threshold for *t* statistics significance is 0.05 at a confidence level of 95%. Based on the analysis, HC is discovered to be significant when it comes to influencing IG. Nonetheless, other coefficients are discovered to be insignificant since the *p* values are higher than 5%, where the moderating effect, which has been discovered to be significant, is between CC and EO. Hence, one can imply that EO moderates the association between IC and IG in a meaningful manner regarding CC.

Regarding impact, all the path coefficients are positive, which verifies that an increase in one would ultimately enhance the IG of SMEs in Pakistan. This research has been carried out primarily to outline the significance of IC, specifically in nurturing the extent of innovation in

a business. According to findings from Sakakibara et al. (2010), the idea of IC is outlined as a type of knowledge dedicated to offering a competitive advantage to businesses.

According to Hair et al. (2016), the variance in all independent variables explains the variance in the dependent variable, which is considered *R*-squared. The *R*-squared ranges from 0 to 1, with higher values indicating a greater explanatory power. As a guideline, *R*-squared values of 0.75, 0.50, and 0.25 can be considered robust, moderate, and weak. The *R*-squared has been calculated as 42.34% (Table 7), which signifies that the variance in all IC dimensions with the moderating effects describes 42.34% variance in the IG. Moreover, after the adjustments, the value comes down to 40.7%.

Table 2 Descriptive and demographic characteristics

Item	Characteristics	Frequency	Percent
Gender	Male	170	66.41%
	Female	86	33.59%
Age	≤ 25	50	19.53%
	> 25	100	39.06%
	>26	81	31.64%
	> 45	25	9.76%
Education	Matric	60	23.40%
	Bachelor	107	41.80%
	Master	73	28.52%
	PhD	22	8.59%
Employment	Business owner	146	57.03%
	Own business	55	21.48%
	Both	55	21.48

The idea has primarily been directed towards encouraging businesses to use available knowledge more productively; this knowledge is in various patterns, including human capital, structural capital, and customer capital. Shakina and Barajas (2015) and Z. Wang et al. (2020) have also analyzed the significance and requirement for innovation to enhance high competition performance. The research has also been productive within the instance of the SME industry in Pakistan. The sector is regarded as highly competitive, which compels businesses to explore innovative methods. In Fig. 4, the path model is depicted. This study’s primary objective has been to establish the effect of IC on SMEs’ innovative growth in Pakistan. Three significant sources were uncovered based on existing research: customer capital, structural capital, and human capital. In addition, the moderating impact of

Table 3 Descriptive statistics and correlation matrix

Variable	Obs	Mean	S.D	Min	Max	HC	SC	CC	EO	IG
HC	256	4.027	0.617	2.25	5	1				
SC	256	4.125	0.587	1.75	5	0.642***	1			
CC	256	4.079	0.643	1.5	5	0.562***	0.676***	1		
EO	256	3.956	0.758	1	5	0.452***	0.419***	0.580***	1	
IG	256	3.899	0.621	2.75	5	0.549***	0.479***	0.498***	0.380***	1

t statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4 Factor loadings, validity, and reliability

Variables	Indicators	Factor loadings	Cronbach’s alpha	Composite reliability	Average variance extracted (AVE)
<i>Customer capital</i>	CC1	0.7661	0.8465	0.8960	0.6834
	CC2	0.8411			
	CC3	0.8760			
	CC4	0.8197			
<i>Entrepreneurship orientation</i>	EO1	0.8250	0.8647	0.9021	0.6504
	EO2	0.8752			
	EO3	0.8868			
	EO4	0.6979			
	EO5	0.7293			
<i>Human capital</i>	HC1	0.6028	0.7660	0.8496	0.5890
	HC2	0.7933			
	HC3	0.8400			
	HC4	0.8110			
<i>Innovation growth</i>	IG1	0.6974	0.7904	0.8647	0.6165
	IG2	0.8479			
	IG3	0.8325			
	IG4	0.7536			
<i>Structural capital</i>	SC1	0.8479	0.8346	0.8905	0.6717
	SC2	0.8748			
	SC3	0.8435			
	SC4	0.7009			

Table 5 Discriminant validity

	Customer capital	Entrepreneurial orientation	Human capital	Innovation growth
Entrepreneurial orientation	0.7525			
Human capital	0.7061	0.6006		
Innovation growth	0.6131	0.4966	0.7217	
Structural capital	0.8077	0.5351	0.8118	0.5872

Table 6 Path coefficients and significance

	Path coefficient	t statistics	p values
Customer capital -> innovation growth	0.186	2.352	0.019*
Entrepreneurial orientation -> innovation growth	0.103	1.374	0.170
Human capital -> innovation growth	0.380	4.931	0.000***
Structural capital -> innovation growth	0.063	0.707	0.480
Moderating effect (HC*EO) -> innovation growth	0.092	1.453	0.147
Moderating effect (SC*EO) -> innovation growth	-0.063	0.832	0.406
Moderating effect (CC*EO) -> innovation growth	0.156	2.032	0.043***

Fig. 4 Path coefficient measurement

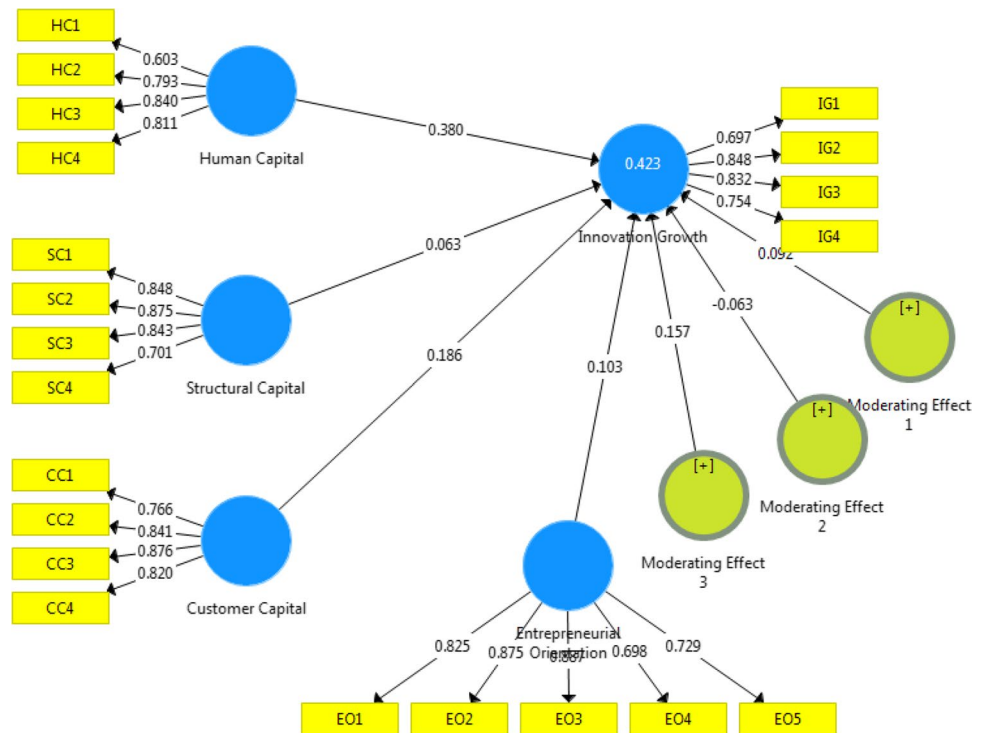


Table 7 Quality criterion of the model

	R-squared	R-squared adjusted
Innovation Growth	42.34%	40.7%

entrepreneurship orientation has been at the center of this study. In light of this, six different hypotheses were established based on the literature findings that have also been

examined using statistical measures. The research findings point out that human capital has a positive and significant effect on innovation and growth. This result is also backed by one of the secondary findings, which propose that human capital affects companies’ innovation ability so that when employees have innovative and creative thinking, it leads to enhanced innovative design processes, which ultimately increase and improve an organization’s ability to innovate.

Nonetheless, based on the collected findings, it can also be derived that EO does not moderate the association between CC and IG, specifically in the SME sector in Pakistan. Another significant determinant was structural capital, and its effect has also been studied. These findings depict that there is no confirmation of SC on IG for the considered SMEs. It can also be expressed how structural capital is related to the process or environment that encourages human capital. Nonetheless, if employees are used to working in an unsupportive atmosphere and business processes, one can derive that the structural capital might not influence human capital. In this regard, it can be implied that structural capital does not affect IG (Zhang et al., 2021).

Similarly, the research also shows that EO does not moderate the association between SC and IG. Thirdly, the determinant customer capital was also examined to establish its effect on IG. According to the findings above, it has been discovered that CC has a significant impact on IG. Using one of the previous findings, one can also verify that customer capital promotes innovation and growth to offer productive feedback, input, and knowledge, which can be utilized productively to nurture innovation processes (Ullah et al. 2021b).

To summarize, HC and CC have a significant effect on the IG of SMEs of Pakistan and EO's moderating effect with CC. These findings noticeably agree with the research by Alzuod et al. (2017), applied to SMEs in Jordan. These results propose that there are similarities between the characteristics of SMEs in Pakistan and Jordan. Additionally, research by Uribe-Echeberria et al. (2019) also backs the findings in the instance of HC's role in enhancing organizational success and innovation. Research by Han and Li (2015) applied to Chinese businesses supports the study's investigation and findings. All these elements derive that the importance of IC for SMEs in Pakistan is the same as that of a few other countries like China, Turkey, and Jordan, when it comes to improving innovation effectiveness, hence leading to marginal growth. SMEs cannot overlook the importance of IC in the SME sector of Pakistan. In this regard, one can propose that IC is a significant factor for businesses that want to innovate. Based on the findings, one can propose that two of the determining factors of IC are HC and CC, and they have a significant effect on the IG of SMEs operational in Pakistan. In this instance, a substantial effect of SC on IG has not been found. Also, it has been discovered that EO moderates the association between HC, SC, and IG. Nonetheless, it was noticed that EO moderates the association between CC and IG.

Discussion

Firms in the modern business atmosphere are more open to innovation growth. It holds that competition is escalating and organizations need more novel products and services

while enhancing processes and methods to obtain optimal efficiency (Ullah et al. 2021a). The rising competition, coupled with increasing complications in the work atmosphere, has made building a distinct rank in the industry. It has been observed that this aim can be fulfilled well with innovation. At present, the most significant and most productive assets for companies are the intangible ones (Waseem et al. 2018). These include human capital, brand value, customer relationships, and more; these are crucial for companies in the modern environment. Great efforts are being employed to achieve improved IC, which would sooner or later be optimized for improved effectiveness and performance. In terms of this capital, it is also clear that customer capital and human capital are significant for businesses. They must pay close attention to these prospects to guarantee growth and success (Khan et al. 2021; Umeair et al. 2020). One of the most important aims of a business pertains to adding to its revenues and sales, and this can be done if a company is effectively able to appeal to a large number of customers. One can assert that companies with diverse knowledge and human creativity would be more successful at building on cutting-edge ideas and new ways of integrating knowledge. This ability can improve its ability to catch remote technological or market opportunities for innovating profound products. Hence, talent and creativity at an individual level are the first steps of the holistic innovation process (Ullah et al. 2021c). However, these findings ought to be considered cautiously as the elements like bad leadership, unsuitable organizational culture, or inadequate compensation. Reward mechanisms were not considered in this research, which has been created on the premise that information sharing can potentially change employee behavior, resulting in the development of the saturation above points (Abbas et al. 2021b; Ullah et al. 2021b).

Consequently, the association of technological and human capital with radical innovation appears to be significantly complicated given these results. Although a business attempts to attain this kind of IC have an identical collection pattern during the initial steps, the relationship between IC and radical innovation alters once a turning point is approached. The association between technological capital and radical innovation starts to drop its initial strength. Additional attempts to attain this kind of capital do not prove fruitful in improving radical innovation outputs, hence depicting logarithmic growth. On the other hand, human capital exhibits a varying collection pattern in its association with revolutionary innovations.

Conclusion and policy implication

This research analyzed the impacts of intellectual capital and the balancing power of entrepreneurial orientation on innovation growth in Pakistan's SME sector. A

quantitative approach on smart PLS was applied through the SEM model, backed by a survey to gather primary data from 256 participants of Pakistan's SME sector. IC is one of the essential elements in boosting the innovation quotient already established in the SME sector in Pakistan. Even though some IC dimensions are not significant, their role in comprehensive IG cannot be overlooked. Moreover, EO is also considered a driver of organizational growth and innovation. Therefore, managers of SMEs in Pakistan need to change their behavior accordingly to enhance optimal performance in their organizations, leading to innovation growth. Furthermore, IC is good for improving IP, which means that SMEs ought to improve these three IC dimensions (IG, IP, and CC). This research also backs EO's impact, partially moderating the association between IC and IP among SMEs in Pakistan. Human capital has been identified as an essential factor in conjunction with the other factors, which play a role in innovation and enhanced business performance. Many SMEs take advantage of human capital, using this critical factor to build a competitive advantage in the market. With an improved value, it has been inferred that companies with effective and productive human capital have a greater probability of accomplishing in the industry with regard to enhanced performance. Organizations that can effectively appeal to customers and sustain them for a considerable period can succeed in the market and leave their rivals lagging. Leadership also contributes to guaranteeing that the company is on the right path and that efficient decision-making occurs. A business mainly faces different hurdles and competition when operating in complex situations. Hence, it trickles down to an entrepreneur's ability to handle the problems and ensure that smooth operations continue in the long term.

Based on the findings above, we suggest a policy framework as follows:

- Businesses need to invest in their intellectual capital through training sessions, skill improvement, and career advancement.
- Additionally, there ought to be a suitable distribution of resources by intellectual capital since it can be a hurdle and at the same time lead to growth and success.
- A business's ability to innovate is exceptionally crucial and can be considered an essential factor in SME growth and performance.
- The companies operating in the manufacturing sector of Pakistan are also advised to increase awareness among their employees to align their goals with the organization's goals to achieve sustainability. Furthermore, it is also the government's responsibility to initiate the programs in which employees are provided with the training. In this manner, businesses can create more awareness

among their employees and enhance overall business sustainability.

- Considering these contributions, managers and owners of SMEs should enhance and build a direction to improve business performance. Owners of SMEs can aid the innovation process by offering a technologically improved working atmosphere.
- R&D divisions should not be neglected since they play a role in improving human capital's innovative capability. Efficient use of the available resources is essential.
- The purview of this research can be broadened in multiple ways — it can also be examined empirically.

This framework can be applied to small and medium businesses with various manufacturing, trading, or service activities. In addition, it can be employed in multiple countries under varying scenarios. Elaborate reading of existing research can point towards additional strategic resources, contributing significantly to SME performance. This study is limited to Pakistan's economy. In future studies, researchers need to focus on other emerging economies for a thorough assessment.

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Availability of data and materials The data that support the findings of this study are available on request.

Declarations

Ethics approval and consent to participate The authors declare that they have no known competing financial interests or personal relationships that seem to affect the work reported in this article. We declare that we have no human participants, human data, or human tissues.

Consent for publication We do not have any individual person's data in any form.

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