

Moderating effect of Knowledge Management on the relationship between Intellectual Capital and Export Performance

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Abstract

This study explores the moderating role of knowledge management on the relationship between intellectual capital and export performance. While previous research has separately addressed the importance of intangibles and knowledge management in organizational performance—eventually linked to export performance—this study provides an analysis of the interaction between the components of intellectual capital (human, relational, and structural) and knowledge management in fostering global success within emerging economies. Based on surveys conducted with Peruvian textile exporters, the proposed model was tested using structural equation modeling (partial least squares). The findings reveal that human and structural capital have the greatest impact on export performance, and knowledge management positively moderates the relationship between human capital and export performance.

Palabras clave: export performance; intellectual capital; knowledge management; textile industry; structural equations

El efecto moderador de la Gestión del Conocimiento en la relación entre el Capital Intelectual y el Desempeño Exportador

Resumen

Este estudio explora el rol moderador de la gestión del conocimiento en la relación entre el capital intelectual y el desempeño exportador. Mientras investigaciones previas han abordado de manera separada la importancia de los intangibles y de la gestión del conocimiento en el rendimiento organizacional (eventualmente el desempeño exportador), este estudio aporta un análisis de la interacción entre los componentes del capital intelectual (humano, relacional y estructural) y la gestión del conocimiento en la generación del éxito global dentro de economías emergentes. A través de encuestas realizadas a exportadores textiles peruanos, el modelo planteado se contrastó mediante ecuaciones estructurales (mínimos cuadrados parciales). El capital humano y el estructural tienen mayor impacto en el desempeño exportador y se encontró que la gestión del conocimiento modera positivamente la relación entre el capital humano y el desempeño exportador.

Keywords: desempeño exportador; capital intelectual; gestión del conocimiento; industria textil; ecuaciones estructurales.

O efeito moderador da gestão do conhecimento na relação entre o capital intelectual e o desempenho exportador

Resumo

Este estudo explora o papel moderador da gestão do conhecimento na relação entre o capital intelectual e o desempenho exportador. Enquanto pesquisas anteriores abordaram separadamente a importância dos intangíveis e da gestão do conhecimento no desempenho organizacional (eventualmente o desempenho exportador), este estudo oferece uma análise da interação entre os componentes do capital intelectual (humano, relacional e estrutural) e a gestão do conhecimento na geração do sucesso global dentro de economias emergentes. Por meio de pesquisas realizadas com exportadores têxteis peruanos, o modelo proposto foi testado mediante equações estruturais (mínimos quadrados parciais). O capital humano e o estrutural têm maior impacto no desempenho exportador e foi constatado que a gestão do conhecimento modera positivamente a relação entre o capital humano e o desempenho exportador.

Palavras-chave: desempenho exportador; capital intelectual; gestão do conhecimento; indústria têxtil; equações estruturais.

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1. Introduction

The resource-based approach (RBA), a dominant paradigm in strategic management (Hitt et al., 2016), underscores the intrinsic connection between internationalization and competitive advantage, which is rooted in core capabilities and unique resources (Zou & Stan, 1998). This framework positions intellectual capital (IC) as a critical driver in securing competitive advantage in global markets (Bose & Oh, 2004). While IC has been extensively explored in relation to organizational performance (Galbreath, 2005), its specific implications for export performance (EP) remain insufficiently addressed. Export performance, defined as the extent to which an organization meets its financial and strategic objectives through export marketing strategies (Birru, 2016), has garnered significant global attention due to its pivotal role in ensuring organizational survival and generating income (Olyanga et al., 2022).

Knowledge Management (KM) is pivotal in linking Intellectual Capital (IC) with Export Performance (EP) and plays a crucial role in achieving international competitive advantages (Barkema & Drogendijk, 2007). Beyond tangible assets, KM significantly enhances organizational performance (Andreeva & Kianto, 2012), especially in dynamic, competitive environments where knowledge is the primary asset (Zack et al., 2009).

IC and KM are interrelated concepts encompassing organizational knowledge activities, from accumulation to strategic use (Rastogi, 2000). IC represents the stock of knowledge—human, structural, and relational capital (Bontis, 2001). KM focuses on applying this knowledge to generate organizational value (Meier, 2011).

This study offers a unique exploration of the complex relationship between knowledge management (KM) and export performance (EP). The central research question, derived from our framework, is: Does KM moderate the relationship between intellectual capital (IC) and EP? Notably, there is a clear scarcity of previous studies examining the intersection of KM and internationalization, particularly in emerging economies (Gammeltoft & Cuervo-Cazurra, 2021).

This research focuses on the Peruvian textile export sector, excluding intermediary activities such as agriculture, fishing, and extraction. It specifically targets manufacturing firms within the textile sector that are active in foreign markets because this segment plays a critical role in Peru's economic growth (SIICEX, 2021). Notably, textile exports are primarily driven by small and medium-sized family businesses. The textile and apparel industry, one of the oldest sectors in the global economy, makes a significant contribution to economic development, job creation, poverty reduction, female empowerment, and export revenue generation (Hasan et al., 2016).

The article introduces a general theoretical framework that integrates variables used in the proposed model and concludes with the formulation of research hypotheses. In

the methodology section, we justify the criteria for using the PLS-SEM approach in this study and describe the data collection process through surveys. Finally, we present the results and provide a concluding discussion on the topic.

2. Theoretical framework

2.1 Export Performance (EP)

Export performance, defined as “the firm’s activities directed toward the outcome(s) in the export market” (Chen et al., 2016), is crucial for strengthening a nation’s strategic position internationally (Benfratello et al., 2022). According to Shashank & Mayya (2021), it is essential to identify the factors of export success in order to establish mechanisms for strengthening them, as SMEs are generally unable to compete in the current globalized world without identifying the necessary drivers. While factors influencing export success have been widely studied, no universal model explains which resources or capabilities best support internationalization because there are significant differences across regions and countries (Coudounaris & Björk, 2024).

2.2 Intellectual capital (IC) and Export Performance (EP)

Intangible assets such as IC provide a lasting strategic advantage by creating value (Youndt, Subramaniam, & Snell, 2004). IC plays a vital role in firm performance across both developing and industrialized nations (Kolachi & Shah, 2013), and it is strongly related to EP (Oura et al., 2016). Previous studies in some emerging countries like India and China (Vishnu & Kumar Gupta, 2014; Lu, Wang, & Kweh, 2014) have demonstrated a significant positive relationship between IC and performance. Most recently, Safari et al. (2022) identified intangible factors as potential drivers of performance in Small and Medium-Sized Enterprises (SMEs). Although research has explored the IC-performance link extensively (Curado et al., 2014), these studies remain limited to certain industries and regions (Mention & Bontis, 2013). Bontis (2001) is a seminal reference in the field of intellectual capital, structuring it into three main components: human (knowledge, skills, experiences, and employee competencies), structural (organizational infrastructure, processes, systems, and databases), and relational (the organization’s external relationships with clients, suppliers, and other stakeholders).

2.3 Human capital (HC) and Export Performance (EP)

Human capital (HC) involves assessment and quantification of knowledge, skills, and attitudes (Kim & Kumar, 2009). Rua et al. (2018) emphasize that specialized knowledge—such as managers’ understanding of the market, internationalization processes, and expertise in areas like international marketing, management, finance,

and the effective use of information and communication technologies—plays a crucial role in positively impacting the export performance (EP) of SMEs. [Agyapong et al. \(2016\)](#) found that managerial and innovative capabilities drive changes in the performance of micro and small family firms in developing economies.

Skills refer to the application of knowledge in work contexts and the ability to develop effective solutions to challenges ([Chong et al., 2014](#)). Additionally, a positive attitude and workforce engagement are essential components of HC ([Hamdam & Damirchi, 2011](#)). Managerial attributes, such as experience, commitment, cognitive approaches, and a global perspective, significantly influence EP ([Diamantopoulos & Kakkos, 2007](#)). [Anwar & Shah \(2021\)](#) suggest that top managers of SMEs in emerging economies must remain focused on entrepreneurial activities to achieve superior performance. Moreover, entrepreneurial “global thinking” is critical for international performance ([Miocevic & Crnjak-Karanovic, 2012](#)).

2.4 Structural capital (SC) and Export Performance (EP)

The assessment of structural capital (SC) encompasses both process capital and organizational culture, each of them plays a critical role in enhancing export performance (EP). Process capital, in particular, improves EP by optimizing quality, delivery timelines, and the introduction of new products ([Cheng et al., 2010](#)). Achieving these outcomes requires the development of internal and external capabilities, including information systems, routines, procedures, databases, organizational culture, and process manuals ([Chen et al., 2006](#)). The digitization of process documents into centralized repositories facilitates easy access, thereby encouraging interaction and collaboration among individuals with diverse experiences and expertise ([Lee & Van den Steen, 2010](#)). In such environments, teamwork often supersedes individual efforts, driving significant process improvements ([Chong et al., 2011](#)). According to [Kuratko & Audretsch \(2009\)](#), organizations learn and, through this process, enhance their performance. [Ahmad & Lee \(2016\)](#) argue that technologies and export orientation are critical sources of learning and innovation, which, in turn, enhance the performance of firms in less-developed countries.

Organizational capital also exerts a positive influence on EP ([Ribau et al., 2017](#)). Within this domain, organizational culture is pivotal in fostering and strengthening institutional activities. It promotes social interaction and trust among employees, creating a collaborative atmosphere ([Janet & Alton, 2013](#)). Facilitating knowledge exchange between experienced and novice employees is particularly advantageous for small and medium-sized enterprises (SMEs), where peer learning is a critical component of development ([Cheng et al., 2014](#)). Organizational innovativeness is regarded as a means to enhance a firm’s performance and strengthen its competitive advantage ([Olowofeso et al., 2021](#)). [Falahat et al. \(2020\)](#) found that

innovation capability is an essential factor that contribute to the competitive advantage of exporting SMEs.

The seamless flow of information, as opposed to its stagnation within the organization, is essential for acquiring new knowledge and insights. In this context, knowledge repositories serve as vital resources, acting as hubs for information dissemination and innovation ([Lee & Lan, 2011](#)).

2.5 Relational capital (RC) and Export performance (EP)

RC encompasses relationships with both customers and businesses. [Keskin et al. \(2021\)](#) highlight that distinctive firm capabilities—particularly relational capabilities—equip export firms with a competitive advantage and enhance their export performance in international markets. A strong corporate image assists in acquiring new customers, retaining existing ones, accessing financial support, and obtaining other resources ([Ordoñez de Pablos, 2003](#)). [Le \(2023\)](#) suggests that internationalization is feasible when passive information-sharing processes exist throughout supply chains. Understanding business partners helps identify their specific needs and align processes to meet them, facilitating access to local business networks ([Hilmersson, 2012](#)). Building business relationships not only opens doors to new customers and suppliers but also leverages intangible resources like market insights, consumer preferences, legal considerations, and technological trends to drive internationalization ([Ruzzier et al., 2007](#)).

Knowledge of customer needs and the macroeconomic environment in target markets is vital for guiding strategic decisions and achieving market dominance ([Hilmersson & Jansson, 2012](#)). A customer-centric approach enhances value within marketing channels and strengthens business relationships.

Rooted in network theory, the internationalization process emphasizes the importance of relationships within business networks ([Pedrini, 2007](#)). Participation in global networks offers access to new market opportunities and valuable resources ([Souchon et al., 2012](#)). Connections with intermediaries, such as agents and distributors, provide crucial strategic insights ([Elg, 2008](#)). Balancing the creation of new relationships with the nurturing of existing ones is essential for improved outcomes ([Witt, 2004](#)). Forming alliances and collaborations with other companies significantly impacts export performance (EP) by providing complementary knowledge, resources, and legitimacy ([Peña, 2002](#)).

2.6 Knowledge management (KM) and Export Performance (EP)

The concept of Knowledge Management (KM) has evolved over time. Converting tacit knowledge into explicit knowledge is crucial, especially in resource-scarce environments ([Egbu et al., 2005](#)). Some organizations

have effectively stored explicit knowledge in databases to enhance their operational capabilities (Woo et al., 2004). Recent research by Avenyo et al. (2021) highlights a positive link between digital technology adoption and firm performance, emphasizing the growing role of technology in KM processes.

Wexler (2001) advocates for the development of infrastructure and tools that facilitate the efficient generation, codification, and transmission of knowledge across the organization. Trust is pivotal in enabling knowledge exchange, influencing the shared mindset within the organization and improving operational efficiency (Edvinsson, 2003). Knowledge transfer can occur both formally and informally, through methods such as mentoring, professional gatherings, and collaborative tools like quality circles and coaching (Egbu et al., 2005). Knowledge utilization, as described by Filius et al. (2000), involves applying existing knowledge to new contexts and innovations. Achieving success in international markets requires continuous development of knowledge reservoirs, including technological expertise and productive capabilities (Alegre et al., 2012).

KM has gained significant attention in organizations for its role in enhancing competitiveness (Call, 2005). Various approaches to KM have emerged, some focusing on technological aspects and others on the human element (Gloet & Terziovski, 2004).

International exposure plays a critical role in boosting global performance and fostering corporate expansion (Li et al., 2020). KM is a key factor in enhancing export performance (EP), with the pursuit of specialized knowledge and innovative product strategies directly linked to improved international competitiveness (Bernard et al., 2012, 2018).

Hypothesis 1: There is a positive correlation between knowledge management and export performance.

Intellectual capital (IC) is a crucial asset for organizations, encapsulating knowledge and the capacity for innovation and adaptation in the global market. It consists of human capital (HC), structural capital (SC), and relational capital (RC), which are interlinked and directly influence business performance. Knowledge management (KM) acts as the enabler that transforms IC into tangible value and intangible assets by facilitating the generation and application of knowledge. KM amplifies IC's impact through strategic practices, knowledge-sharing mechanisms, and information technologies, enhancing its effectiveness (Zack et al., 2009). Research confirms the positive relationship between KM and IC, demonstrating their collective role in improving organizational performance (Shih et al., 2010). The specific KM strategy adopted influences the relationship between KM and organizational performance (Ling, 2013).

KM strategies, especially those incorporating information and communication technologies, strengthen

the positive impact of SC on export performance (EP) (Tovstiga & Tulugurova, 2007). Effective KM facilitates the conversion of SC's embedded information into actionable knowledge, thereby positively shaping the dynamic relationship between SC and EP (Karagiannis et al., 2008).

Nawab et al. (2015) demonstrate that effective knowledge management practices—particularly knowledge acquisition, dissemination, and application—positively influence export performance, especially when innovation is present as a mediator. Moreover, structural capital, including organizational structures and the relationships built through intellectual capital, plays a significant role in enhancing export outcomes. Cabrilo et al. (2018) argue that KM practices drive structural capital to foster superior innovation and market performance.

We suggest that the integration of KM into organizational processes can significantly amplify the impact of structural capital on export performance, making it a key factor in driving export success, particularly in SMEs.

Hypothesis 2: Knowledge management serves as a positive moderator in the association between structural capital and export performance.

Human capital (HC), a key component of intellectual capital (IC), creates value within organizations through human resource strategies and process optimization (Roos et al., 2007). Knowledge management (KM) boosts organizational performance by disseminating knowledge from managers with global and intercultural expertise (Piri et al., 2013). A human-centric KM framework can further elevate performance by nurturing HC, leveraging it through effective KM strategies aligned with human resource management practices (Roos et al., 2007).

Tjahjadi et al. (2020) investigated how human capital readiness impacts business performance, with a focus on the role of global market orientation. Their findings indicate that while human capital positively influences business performance, its effects are partially mediated by market orientation, suggesting an indirect but critical relationship that could also apply to export success.

Kengatharan (2019) explored the intersection of knowledge management, intellectual capital, and entrepreneurship, discussing how various facets of intellectual capital (including human capital) enhance firm performance. Kengatharan's work underscores how knowledge management strategies positively moderate the effects of intellectual capital, enhancing overall business performance. This study found that knowledge management strategies effectively mediate and enhance organizational performance. This includes the role of human capital, where the interplay between knowledge management practices and intellectual capital contributes to a firm's competitiveness, particularly in export-driven contexts.

Hypothesis 3: Knowledge management plays a positive moderating role in the correlation between human capital

and export performance.

RC shapes how companies engage with customers, suppliers, and other organizations, positively influencing knowledge generation and innovation (Ojeda-Gómez et al., 2007). Strengthening these relationships expands market share and enhances performance (Bozburu, 2004). RC's impact on performance is amplified in firms with strong knowledge management (KM) practices that focus on interpersonal interactions and organizational affiliations (Roos et al., 2007).

A people-centered KM strategy strengthens the link between RC and export performance (EP). Similarly, a technology-focused KM strategy, integrating relationships with knowledge databases, fosters innovation and improves global expansion outcomes (Gloet & Terziovski, 2004).

Qiao & Wang (2021) emphasize that the integration of tacit and explicit knowledge sharing enhances organizational performance and highlights the significance of relational capital in sustaining competitive advantages in global supply chains.

Tovstiga & Tulugurova (2007) illustrates that KM strategies that utilize information and communication technologies can significantly amplify the positive effects of RC on export performance. This is particularly evident when firms integrate customer and supplier relationships into their knowledge management systems, which facilitates innovation and global expansion.

Thus, KM not only enhances the direct impact of RC on EP but also acts as a strategic enabler that integrates knowledge across various organizational boundaries, thus fostering improved relationships and operational efficiencies in the global marketplace.

Hypothesis 4: Knowledge management serves as a positive moderator in the association between relational capital and export performance.

The model proposed in Figure 1 shows the interrelationships between the constructs.

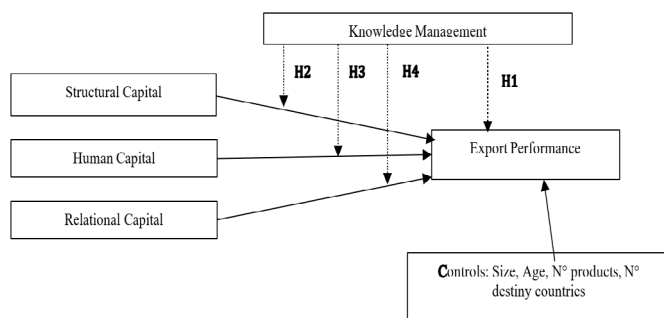


Figure 1. Proposed Theoretical Model

Source: own elaboration

3. Methodology

3.1 Sample

To conduct this study, the target population was centered on the Peruvian textile sector. This choice was motivated by the fact that companies exclusively engaged in product commercialization primarily function as intermediaries and facilitators of trade. Consequently, we exclude firms with products typically processed by other entities because they are subject to various restrictions—conditions that are not generally applicable to the textile sector (Cardoza et al., 2016). Focusing on a single sector allowed for better control over a greater number of contextual variables. Additionally, the Peruvian textile sector exported nearly USD 2,000 million in 2022 (Banco Central de Reserva del Perú, 2023).

The data for this study were collected using a questionnaire that incorporated scales adapted and validated in previous research. The scale for measuring export performance was derived from Lages & Lages (2004), which has been widely employed in prior studies. The scales for assessing intellectual capital and knowledge management were adapted from various sources. A five-point Likert scale was used (1='strongly disagree', 5='strongly agree').

The PLS-SEM method is able of handling relatively small sample sizes compared to other approaches, such as covariance-based SEM. A well-established rule in PLS-SEM suggests that the sample size should be at least ten times the maximum number of indicators (items) for a latent construct in the measurement model or the maximum number of structural paths leading to a construct in the structural model (Hair et al., 2017). In our case, the minimum required sample size was 91 surveys.

We identified the target population using the database from the Peruvian Exporters Association (ADEX Data Trade, 2021). Given a prior study in the sector, we sent online surveys to fully identify companies (with email addresses and contact people). A total of 249 responses were received (34% response rate) over a period of 5 months. After excluding incomplete responses, we obtained 207 valid surveys, which is sufficient for applying the PLS-SEM method.

Through the incorporation of control variables, we found no significant differences between the sample and the reference population regarding the quantity of exported products or the number of export destination countries.

3.2 Measurements

3.2.1 Dependent variable: Export performance (EP)

EP was evaluated through four indicators: export intensity (EP1), export growth (EP2), perceived success (EP3), and strategic position and market share (EP4) (Lages & Lages, 2004). These indicators are situated within economic, financial, and strategic dimensions, and encompass satisfaction with export outcomes.

3.2.2 Independent variable: Intellectual capital (IC)

HC was measured in three dimensions: knowledge (HC1 to HC5), skills (HC6 to HC8), and attitudes (HC9 to HC11). SC was measured in two dimensions: processes (SC1 to SC4) and organization (SC5 to SC7). RC was measured in two dimensions: clients (RC1 to RC6) and business (RC7 to RC11).

3.2.3 Moderating variable: Knowledge management (KM)

The KM variable has been measured through the identification of its four stages: knowledge generation (KM1 to KM3), knowledge codification (KM4 to KM5), knowledge transmission (KM6), and knowledge usage (KM7 to KM9).

Control variables:

TIME represents the number of years the company has been engaged in export activities (Laureano & Marques, 2009); WORK indicates the number of workers (Shinkle & Kriauciunas, 2010); NO_PROD indicates the number of products exported (Morgan et al., 2004); and NO_COUNTRY represents the number of countries to which the company exports (Johanson & Vahlne, 2009). The incorporation of control variables into the model allowed for isolating the effect of the main variables, thus ensuring that results were not influenced by external factors and enabling a more precise interpretation of causal relationships. Furthermore, it improved internal validity by controlling factors such as company size, export experience, and geographical location, providing a clearer view of the sector's performance.

4. Results

4.1 Partial least squares (PLS)

Partial least squares structural equation modeling (PLS-SEM) was employed to test the proposed hypotheses (Hair et al., 2017). It was selected due to the relatively small sample size, the presence of multiple dependent variables, and the absence of assumptions about the distribution of variables, rendering it more suitable in this context (Sarstedt et al., 2014). To estimate both the structural and measurement models, SmartPLS3 software (Hair et al., 2017) was used with PLS algorithms and bootstrapping resampling. The significance of the path coefficients and the overall fit of the model were assessed through bootstrapping of 1,000 subsamples (Reinartz et al., 2009).

4.2 Measurement model

Our model comprises five latent variables: EP, HC, SC, RC, and KM. The focus is on examining the relationship between the three dimensions of IC and EP, with KM serving as a moderating variable in the relationships between HC and EP, SC and EP, and RC and EP, as outlined in hypotheses

2, 3, and 4. It is anticipated that in companies with robust KM, there will be a stronger and more positive relationship between HC, SC, RC, and EP. The study aims at evaluating the presence of these moderating effects by employing interaction terms in a two-stage approach (Rigdon et al., 2011).

Table 1. Scales, loads, and measures of validity and reliability.

Item	Loading (t-value)
Structural Capital (SC)	
CR=0.864; AVE=0.680; Cronbach's Alpha=0.764	
sc1	0.797 [26.824]***
sc2	0.801 [37.277]***
sc4	0.874 [47.992]***
Human Capital (HC)	
CR=0.917; AVE=0.649; Cronbach's Alpha=0.892	
hc2	0.876 [38.747]***
hc3	0.888 [46.373]***
hc4	0.704 [16.370]***
hc5	0.798 [42.766]***
hc8	0.768 [21.898]***
hc11	0.785 [32.513]***
Relational Capital (RC)	
CR=0.938; AVE=0.655; Cronbach's Alpha=0.924	
rc1	0.845 [35.763]***
rc2	0.822 [28.731]***
rc4	0.850 [38.108]***
rc5	0.821 [35.237]***
rc6	0.790 [26.949]***
rc7	0.860 [47.090]***
rc8	0.781 [24.314]***
rc10	0.693 [16.149]***
Export Performance (EP)	
CR=0.893; AVE=0.677; Cronbach's Alpha=0.838	
ep1	0.932 [133.433]***
ep2	0.727 [23.372]***
ep3	0.803 [35.715]***
ep4	0.818 [37.332]***
Knowledge Management (KM)	
CR=0.860; AVE=0.671; Cronbach's Alpha=0.755	
km1	0.816 [30.049]***
km5	0.822 [38.074]***
km9	0.820 [32.422]***

Notes: Significance through a resampling procedure (1,000 repetitions). * p < 0.10; ** p < 0.05; *** p < 0.001. CR: composite reliability; AVE: average variance extracted.

Source: own elaboration.

The PLS-SEM model employed in this study has been validated, and its reliability has been confirmed. Evaluation of the measurement model indicates that all measures demonstrate a high level of validity and reliability. The indicators exhibit loadings greater than 0.70, and the Average Variance Extracted (AVE) exceeds the threshold of 0.50 (and slightly below 0.70), thus reflecting convergent validity, as presented in Table 1. Discriminant validity of the indicators is established, as indicated by higher loads compared to cross loads, as demonstrated in Table 2. Regarding the moderator variable (KM), all indicators exhibit

loadings greater than 0.70. The assessment of convergent validity yields an AVE of 0.671, while Cronbach's alpha and composite reliability stand at 0.755 and 0.860, respectively, thus indicating satisfactory internal consistency. In summary, the quality criteria proposed by Hair et al. (2017) for the measurement model were met.

Table 2. Cross-Loadings

Item	Structural Capital (SC)	Human Capital (HC)	Relational Capital (RC)	Export Performance (EP)	Knowledge Management (KM)
sc1	0.797	0.571	0.114	0.670	0.520
sc2	0.801	0.423	-0.094	0.806	0.613
sc3	0.874	0.517	-0.031	0.795	0.568
hc2	0.624	0.876	0.389	0.571	0.659
hc3	0.351	0.888	0.624	0.332	0.623
hc4	0.235	0.703	0.591	0.176	0.475
hc5	0.729	0.798	0.202	0.797	0.738
hc8	0.379	0.768	0.379	0.278	0.546
hc11	0.431	0.786	0.359	0.456	0.589
rc1	0.010	0.408	0.845	-0.012	0.248
rc2	-0.085	0.320	0.822	-0.105	0.105
rc4	0.009	0.504	0.850	0.026	0.281
rc5	0.011	0.397	0.821	-0.043	0.211
rc6	-0.039	0.358	0.790	-0.060	0.148
rc7	0.012	0.468	0.860	-0.005	0.281
rc8	0.087	0.386	0.781	0.059	0.233
rc10	-0.086	0.313	0.693	-0.121	0.142
ep1	0.866	0.476	-0.151	0.932	0.608
ep2	0.687	0.695	0.270	0.727	0.726
ep3	0.725	0.183	-0.329	0.805	0.384
ep4	0.737	0.647	0.179	0.814	0.631
km1	0.586	0.723	0.306	0.563	0.816
km5	0.579	0.617	0.179	0.611	0.822
km9	0.523	0.547	0.165	0.550	0.820

Source: own elaboration.

4.3 Structural model

The model effectively predicts the behavior of endogenous variables (SC, RC, and EP), with R² values of 0.73, 0.52, and 0.93, respectively, indicating a robust explanatory power of the model. The path coefficients, highlighted in the studies by Hair et al. (2017) and Monge et al. (2013), demonstrate significance. These findings support the H1 hypothesis, suggesting a positive and significant impact of KM on EP. Furthermore, the model integrates moderator effects and moderate mediation, indicating that the direct effects may vary depending on the value of the moderator variable (KM). Moderating mediation occurs when the mediator variable (SC or RC) interacts with the moderator (KM), influencing the indirect effect between the exogenous variable (HC) and the endogenous variable (EP) via the mediator. Significance tests are conducted on the connecting paths to establish moderate mediation. When interpreting results, particular attention is given to the significance of the interaction term, and the estimated

effect values reflect the magnitude of the relationship when the moderator variable equals zero. If the moderator variable's level changes by one standard deviation, the simple effects would also change by the magnitude of the estimated coefficient for the corresponding interaction terms.

According to the findings outlined in Table 3, the interaction term KM*HC exhibits a positive effect on EP (0.063), whereas the simple effect of HC on EP is 0.262 (Hypothesis H2). This suggests that in companies with a high degree of KM, the influence of HC on EP will be more pronounced compared to those with lower KM. The bootstrapping analysis comprising 1,000 subsamples demonstrates that the interaction term is significant at the 95% confidence level. The interaction effect size f² is 0.018, indicating a medium effect.

Concerning the KM*RC interaction term, it also demonstrates a positive and significant association (Hypothesis H4). Higher levels of KM imply a stronger linkage between RC and EP, whereas lower KM levels result in a relatively weaker association between RC and EP, albeit with a minor difference. The interaction effect size f² in this instance is 0.0001, indicating a small effect. However, there is no support for H2, as the interaction term KM*SC exhibits a negative effect on EP (-0.252), contrasting with the simple effect of SC on EP at 0.758. This implies that as KM levels increase, the relationship between SC and EP diminishes, whereas for lower KM levels, the association between SC and EP strengthens. The interaction effect size f² in this scenario is 0.383, suggesting a substantial effect. In summary, the results uphold hypotheses H1 and H4 but fail to provide evidence for H2. The interaction terms significantly influence the model, underscoring the importance of considering the moderating impact of KM on the relationships between HC, SC, RC, and EP. The model incorporating interaction effects demonstrates enhanced explanatory power compared to the model devoid of these effects.

5. Discussion

Our study contributes significantly to KM literature, particularly by examining the moderating role of KM in the relationship between IC dimensions and EP. First, we confirm that KM has a positive impact on EP (Ha et al., 2021; Latif et al., 2021; Mbaidin, 2022). This supports our initial findings that KM plays a crucial role in enhancing performance outcomes.

However, our assessment of KM as a moderator in the relationship between the dimensions IC (human capital [HC], structural capital [SC], and relational capital [RC]), and EP yields more nuanced results. Specifically, KM was found to positively moderate the relationship between HC and EP, suggesting that higher levels of KM strengthen the link between HC and EP. This finding is consistent with the work of Roos et al. (2007), who emphasized the positive impact of KM through people-centered strategies on organizational performance. Additionally, Piri et al. (2013)

Table 3. Standardized Model Coefficients Corrected for Bias, Confidence Interval (95%).

		Correction for Bias 95% CI					
H	Parameter	Estimated	Std. Error of the Est.	Lower Bound	Upper Bound	p-Value	Sig.
H1	EP -> KM	0.066	0.042	-0.012	0.152	0.100	*
H2	EP -> KM*SC	-0.252	0.033	-0.315	-0.191	0.000	***
	EP -> SC	0.758	0.052	0.661	0.860	0.000	***
H3	EP -> KM*HC	0.063	0.038	-0.010	0.141	0.099	*
	EP -> HC	0.262	0.060	0.155	0.385	0.000	***
	EP -> KM*RC	0.004	0.042	-0.044	0.051	0.100	*
H4	EP -> RC	0.024	0.027	-0.029	0.073	0.369	
	SC -> HC	0.610	0.043	0.513	0.685	0.000	***
	RC -> HC	0.497	0.060	0.363	0.595	0.000	***
Indirect Effect							
	EP -> HC	0.484					
Controls	EP-> WORK	-0.301	0.053	-0.406	-0.201	0.000	***
	EP -> TIME	-0.100	0.029	-0.162	0.000	***	
	EP -> NO_COUNTRIES	0.121	0.030	0.186	0.000	***	
	EP -> NO_PRODS	0.005	0.022	-0.038	0.047	0.808	

Notes: resampling standard error; *p<0.10; **p<0.05; ***p<0.01.

Source: own elaboration.

further corroborate this view, noting that KM's effects on performance are notably tied to elevated levels of HC.

Recent studies reinforce the importance of KM in enhancing HC's contribution to business outcomes. For instance, [Tjahjadi et al. \(2020\)](#) demonstrated that human capital readiness, supported by strategic KM practices, directly boosts business performance, including export success. This highlights the critical role of KM in leveraging HC for performance outcomes.

Our findings also align with the notion that KM serves as a strategic enabler for organizations. [Duan et al. \(2022\)](#) show how KM enhances the use of relational capital, thereby improving innovation and performance. While this work primarily focuses on relational capital, it emphasizes KM's broader role in fostering better outcomes through both human and structural capital.

In contrast, the moderating effect of KM on the relationship between RC and EP is less pronounced, with a relatively small effect size. This suggests that KM strategies that do not prioritize technological integration may struggle to fully leverage RC to generate value. [Roos et al. \(2007\)](#) argue that when KM practices focus primarily on people rather than technology, RC may lack the capacity to create substantial value. This is consistent with the findings of [Gloet & Terziovski \(2004\)](#), who pointed out that non-significant RC, coupled with substantial knowledge databases, leads to weak positive moderation in the RC-EP relationship.

Furthermore, the interaction between KM and SC yields a negative coefficient, contrary to the direct positive effect of SC on EP. This suggests that the knowledge transmission dimension may not be relevant in this context, potentially due to a lack of technological focus in the KM strategy ([Karagiannis et al., 2008](#)). This finding reflects the challenges in converting tacit knowledge into explicit,

actionable knowledge, a point also discussed by [Ismail et al. \(2024\)](#), who emphasized the importance of absorptive capacity in this process.

In summary, our study reinforces the idea that HC and SC are the most direct contributors to EP, as suggested by [Edvinsson \(2003\)](#), who noted the importance of excluding RC from models due to empirical results lacking power. These findings may also be influenced by the composition of the sample, which mainly consists of small and medium-sized textile exporting firms. In such companies, KM tends to operate informally, which may limit its effectiveness ([Hutchinson & Quintas, 2008](#)). Many of these firms recognize the strategic importance of their intangible assets but lack the measurement tools to manage them effectively. Consequently, our results highlight the need for companies to develop an "optimum profile" of IC that maximizes synergy with KM to enhance performance.

Overall, these findings suggest that a balanced KM strategy, integrating both technological and people-centric elements, is essential for leveraging the full potential of intellectual capital in improving export performance. However, the context of the industry and the maturity of KM systems must be considered to ensure the strategy's success.

6. Conclusions

This research provides valuable insights into the relationship between intangible resources and organizational performance, with a particular focus on the textile sector in Peru. The study highlights the pivotal role of knowledge management in enhancing export performance and confirms that knowledge management practices positively influence organizational outcomes, especially when combined with high levels of human capital. This

finding aligns with previous research that emphasizes the critical role of intellectual capital in driving performance, particularly in export-driven industries.

However, the study also reveals nuanced dynamics. While knowledge management was found to strengthen the link between human capital and export performance, its moderating effect on relational capital was found to be insignificant. This suggests that knowledge management strategies in these companies may prioritize human-centered approaches, potentially overlooking the technological and relational aspects that could also drive export success. Moreover, the lack of relevance of knowledge transmission in improving export performance points to challenges in effectively converting information into actionable knowledge. This may reflect the informal knowledge management practices prevalent within these small and medium-sized enterprises (SMEs), where measurement tools and formal processes are often lacking.

It is important to consider the limitations of the study, particularly its reliance on a sample predominantly comprising SMEs, which may prevent extending the findings to larger firms or other industries. The study also highlights the need for companies to adapt their knowledge management strategies to their specific context, ensuring that intellectual capital is effectively aligned with organizational needs to maximize performance. Future research should aim to expand the sample to include a more diverse range of companies and sectors, using alternative methods such as interviews or case studies to deepen the understanding of how intangible resources and knowledge management practices impact organizational performance. Despite these limitations, our findings contribute valuable insights into the literature and offer practical implications for managers seeking to leverage knowledge management to boost export performance.

Conflict of interest

The authors declare no conflict of interest.

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