

## RESEARCH ARTICLE

# Intellectual Capital and Financial Performance in Small Manufacturing Companies: The Moderating Effect of Managerial Ambidexterity

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This work involved human subjects or animals in its research. Approval of all ethical and experimental procedures and protocols was granted by the Research Ethics Committee for Social Sciences, Humanities and the Arts.

**ABSTRACT** We verify the moderating effect of managerial ambidexterity on the relationship between intellectual capital and financial performance of small manufacturing companies in Peru. This study used a quantitative, nonexperimental, cross-sectional design. The sample consisted of 506 small manufacturing firms. To determine the validity and reliability of the hypothesized model, we performed exploratory factor analysis using a rotated component matrix to group questions within their corresponding constructs. Next, we assessed convergent and discriminant validity using measures such as Cronbach's alpha, composite reliability, and average variance extracted. Finally, we tested the model hypotheses using structural equation modelling. SPSS 27 and AMOS 24 were used for all the analyses. This study showed that managerial ambidexterity has a partial moderating effect on the relationship between intellectual capital and the financial performance of small manufacturing firms in Peru. Additionally, statistical analysis showed that managerial ambidexterity moderates the direct relationship between structural capital and relational capital with financial performance, while no moderating effect was observed for human capital. This research constitutes a pioneering study within developing economies, as investigating the moderating effect of managerial ambidexterity on the relationship between intellectual capital and the financial performance of small manufacturing companies in Peru provides valuable information that closes knowledge gaps within this field of study. Additionally, it offers valuable insights for the business sector to analyse the relationship between the hypothesized variables and make informed decisions regarding the benefits and sustainability of companies.

**INDEX TERMS** Intellectual capital, financial performance, managerial ambidexterity, small businesses, emerging economy.

## I. INTRODUCTION

In the field of business administration, proper management of intangible resources is a key factor in organizational development [1]. In this context, knowledge, information, intellectual property, and the experience of human talent constitute

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resources that contribute to a company's growth [2]. A widely used theory in research on the management of intangible company resources is resource-based view (RBV) theory [3]. The RBV provides a conceptual framework that helps organizations take advantage of their internal resources and capabilities, such as human and structural capital, to obtain good financial performance [1], [4], [5], [6], [7]. The RBV includes all assets, capabilities, organizational processes, company

characteristics, information, and knowledge controlled by the same company, enabling the development of strategies to increase its effectiveness and efficiency [1], [3], [8].

Despite the importance of RBV in managing business resources, it has been criticized for not providing useful recommendations to company managers. It does not specify the resources that must be accumulated to achieve competitive advantage, lacks self-explanatory arguments, its relevant domain is unclear, and is overly general regarding the question of whether different configurations of resources and capabilities achieve the same purpose [3], [8], [9]. Given these concerns and criticisms, Edvinsson and Malone [67], Priem and Butler [10] proposed a mid-range theory called Intellectual Capital Theory, which complements the RBV and considers that a company's intangible assets are valuable resources that must be managed and valued appropriately through its three components: human, structural, and relational capital; have sustainable financial performance, which has also been corroborated by Stewart [11].

Intellectual capital (IC) encompasses knowledge with the potential to generate value. This concept is comprehensive and includes inventions, ideas, general knowledge, designs, software, data processes, and publications [12], [13]. Edvinsson and Malone [14] established IC as the ownership of knowledge, applied expertise, organizational technology, customer relationships, and professional abilities that confer a competitive advantage in the marketplace. Considering the information provided, Intellectual Capital (IC) is seen as a useful body of knowledge [15], [16] that enables individuals to comprehend a social group such as an organization, intellectual community, or professional field [13].

Intellectual capital (IC) refers to the intangible assets a company owns to enhance its financial performance. These intangible resources have the capacity to improve rapidly. In addition, intellectual capital (IC) can improve a company's long-term ability to compete and act as a catalyst for innovation [17], [18], [19], [20], [21], [22]. Hence, effective management of intellectual capital (IC) is crucial for a corporation to enhance its financial competitiveness and performance [6], [7].

Financial performance (FP) refers to a firm's ability to generate results within predetermined dimensions in relation to its targets [8]. According to Dzomonda [23], FP demonstrates a firm's effectiveness and efficiency in achieving profitability objectives. In today's knowledge-based economy, a firm's FP is heavily dependent on its IC as it is the most valuable resource for the firm [7], [17], [24].

The relationship between IC and FP in firms has consistently been an important topic in the literature. It has gained significant prominence over the last 20 years and has become even more relevant in the knowledge era [24], [25], [26]. However, studies conducted over the last decade have reported contradictory results. For example, previous studies have shown that the relationship between IC and FP is positive and significant [7], [9], [16], [26], [27], [28], [29], [30], [31], [32], [33]. In contrast, some studies

have found a significant negative relationship between IC and FP [34], [35].

The inconsistencies in the results regarding the relationship between IC and FP can be attributed to several factors: variations in the selected samples [7], unclear definitions of IC [7], [36], [37], the use of various terms with similar meanings [22] the dimensions that comprise IC [15], [19], [38], and unclear measurement methods [6], [7], [36], [37], [39], [40], [41]. However, inconsistencies or contradictions in the results of previous studies offer opportunities for further research [5], [32], [42], [43]. The existing literature suggests that inconsistencies in studies concerning the two variables can be addressed by using moderating variables [44], [45], [46]. At the same time, other research suggests that it contributes more to this field of research through studies developed in emerging economies [41], [47], [48].

Managerial Ambidexterity (MA) is a management approach involving a blend of short-, medium-, and long-term planning, balancing exploitation, and exploration activities to enhance firm performance (FP) [20], [49], [50], [51], [52]. However, research indicates that simply possessing resources and capabilities does not automatically lead to improved FP [8], [53]. Effective strategy orchestration and resource management are essential for maximizing FP, particularly for small companies, because of their limited resources [1], [54], [55]. Consequently, the business administration literature underscores the significance of MA in boosting the FP of companies [49], [50], [52].

Over the past decade, ambidexterity has gained prominence in organizational or business unit-level research; however, theoretical and empirical attention at the management level is scarce [56], [57], [58]. In this sense, recent studies have shifted their focus of exploration and exploitation from the organizational level to the individual level (manager-entrepreneur) to understand how MA affects FP outcomes [52], [59]. Furthermore, the literature suggests that MA can solve FP dilemmas by facilitating the coexistence of exploitation and exploration activities [20], [51], [52].

Considering the above, this study seeks to address the following research question: How does IC relate to FP in small firms? Additionally, MA moderates this relationship. By examining these questions, we aim to contribute to the existing literature that calls for a deeper investigation into the relationship between IC and FP [1], [8], [43]. Furthermore, we seek to address the concerns of other researchers who have expressed the need to determine whether MA moderates the relationship between IC and FP [1], [47], [48], [60], [61].

## II. LITERATURE REVIEW

### A. INTELLECTUAL CAPITAL AND FINANCIAL PERFORMANCE

IC in academia, encompassing various terms, such as intangible and invisible capital, is pivotal in enhancing firm value and economic income [5], [14], [62]. According to Asi-aei et al. [63] and Berzkalne and Zelgalve [64], IC is defined

as the knowledge gathering that businesses use to remain competitive in the market. Recent studies have highlighted IC's role of IC in innovation, FP, and competitive advantage [16], emphasizing its management for better FP [6] and its formation through knowledge management [63].

IC is multidimensional, incorporating individual, organizational, and network levels [65], with a three-dimensional framework providing clarity in categorization [66]. The three primary components of the IC are human capital (HC), structural capital (SC), and relational capital (RC) [38], [40], [67], [68].

HC encompasses the capabilities, knowledge, skills, and experience of a firm's employees and is considered the most crucial element of IC because of its representation of employee value [14], [22], [40], [69]. HC is vital for maximizing firm efficiency and profitability [40]. In this sense, recent studies highlight the importance of the relationship between intellectual capital and job satisfaction and stability, highlighting the relationship between the HC and PF of companies, demonstrating that the HC is an indispensable resource for guaranteeing an adequate PF of the company [4], [5], [16].

SC represents the foundational infrastructure that supports HC in a firm, including organizational capacity and physical systems for intellectual material transmission and storage [5], [14], [22]. SC, which can be replicated and shared, encompasses legal intellectual property rights and is integral for knowledge transfer, enhancing production quality, communication, and problem solving [22], [26], [69].

RC refers to a firm's customer relationships, which are crucial for firm value and the creation of value through external stakeholder interactions, thus impacting brand loyalty, market image, and reputation [14], [68], [70]. Wang and Hu [22] regard RC as the IC's most valuable component, underscoring the role of customers and stakeholders in firm performance and advocating customer involvement in supplier selection for increased satisfaction [22], [67], [70].

FP is the assessment and measurement of an organization's efficiency and effectiveness in managing its financial resources and delivering positive results. This involves analyzing profitability, liquidity, financial strength, and other key indicators to ensure a company's ability to generate sustainable value over time [8].

The relationship between IC and FP presents complexities in both their nonlinear nature and their direct linearity [71]. Therefore, predicting the effect of complex or non-linear relationships on a firm's FP can be challenging because of the contingency of these interactions, the specific context in which the firm operates [26], [71], and the interaction of IC dimensions with each other. Therefore, it is critical that firms understand the contingent nature of these relationships and foster positive interactions while minimizing conflicts and redundancies between IC elements [29], [71]. It should be noted that most studies have assumed a direct impact of IC on firm FP [5], [7], [9], [16], [25], [26], [28], [29], [30], [35], [40], [41], [72], [73]. Therefore, following the conceptual

basis of the RBV, which establishes that a company's performance is driven by its tangible and intangible resources, IC is expected to have a direct and positive impact on the FP of small companies [5], [6], [21], [26], [28].

However, there are discrepancies in the relationship between IC and FP. Previous studies have shown a direct positive relationship between IC and FP [7], [9], [16], [26], [27], [28], [29], [30], [31], [32], [33], while others have determined that this relationship is negative [34], [35], [40]. Considering the previously expressed discrepancies and based on the recommendations of some research that has suggested that future studies analyze the relationship between IC and FP [1], [8], [43], as well as considering IC as a single construct that integrates HC, SC, and RC [74], the following hypothesis is proposed:

H1: IC has a positive relationship with FP.

The literature notes that effective IC management can be a way to implement RBV principles in practice by leveraging intangible resources to create and maintain sustainable performance [10], [14]. However, recent research has sought to verify the direct relationship of these resources (HC, SC, and CR) on the FP of companies, and through their results, they have shown discrepancies in terms of direct effects. Xu and Li [41] found that not all of these dimensions have a direct and positive effect on PF, while Xu et al. [7] and Gupta et al. [26], found a direct and positive effect, coinciding with what was established with the RBV. Considering the discrepancies expressed above, the following hypothesis was proposed:

H1a: HC has a direct and positive relationship with FP.

H1b: SC has a direct and positive relationship with FP.

H1c: RC has a direct and positive relationship with FP.

## B. MANAGERIAL AMBIDEXTERITY

Managerial Ambidexterity (MA) refers to managers' ability to flexibly utilize organizational resources to achieve business objectives, involving adaptability and collaboration across diverse situations [75]. MA involves cognitive flexibility and balancing resource exploration and exploitation to enhance organizational efficiency and effectiveness [76], [77]. Recent studies view MA as a combination of exploration- and exploitation-related activities within a specific timeframe [20], [52].

Mom et al. [78] describe MA as encompassing two behaviors: exploratory (seeking new opportunities and focusing on innovation) and exploitative (improving and optimizing existing operations). Duncan's [79] theory of ambidexterity highlights the balance between these activities, which is crucial for resource maximization and new product development [48], [80].

Research measures MA through the interactions between exploration and exploitation activities. Gibson and Birkinshaw [81] and Lin et al. [77] assessed it at the managerial level, while Schnellbacher and Heidenreich [59] examined ambidexterity at the employee level. Mom et al. [82] and Seepana et al. [48] evaluated the MA by calculating the interactions between various management activities.

Rono et al. [47] found that ambidexterity significantly influences the dynamic capability–performance relationship in Kenya’s food and beverage sector. Cenamor et al. [83] observed ambidexterity, moderating the impact of digital platforms and network capabilities on small and medium enterprises’ firm performance. Overall, ambidexterity serves as a crucial variable in enhancing firm capabilities and performance [48], [83].

Some authors agree that ambidexterity plays a positive moderating role in the relationship between the integration of green suppliers and companies’ financial and environmental performance. This consensus highlights the importance of ambidextrous strategies to improve both the financial success and environmental sustainability of companies that participate in green supply chain practices [60], [84]. Similarly, Seepana et al. [48] highlight that MA moderates the transformation of relational resources into useful innovations within firms involved in cooperative relationships.

Strategic management literature emphasizes the importance of managers’ roles in implementing ambidexterity approaches. Future research should explore both the positive and negative impacts of MA on FP, noting a gap in analyzing MA’s moderating effects on this relationship [20], [58], [80].

A literature review revealed a scarcity of research on MA as a moderating variable between IC and FP, especially in small companies in developing countries [20], [48], [50], [58], [61], [85]. This study hypothesizes that MA may explain the inconsistencies in the IC-FP relationship. Ambidexterity is defined as the effective management of a company’s resources through simultaneous exploitation and exploration, which is crucial for sustainability [20], [48], [51], [80]. Therefore, this study proposes the following hypothesis:

H2: Ambidexterity positively moderates the relationship between IC and FP.

H2a: Ambidexterity moderates the direct relationship between HC and FP.

H2b: Ambidexterity moderates the direct relationship between SC and FP.

H2c: Ambidexterity moderates the direct relationship between RC and FP.

### C. CONCEPTUAL MODEL

Figure 1 presents the main research model that tested the relationship between IC and FP of small manufacturing firms in Peru, and the moderating effect of MA on this relationship.

Figure 2 presents the secondary research model, which examined the direct relationship between IC dimensions and FP and the moderating effect of MA on these relationships.

### III. MATERIALS AND METHODS

This study employed a quantitative correlational approach with a cross-sectional design. According to Hernández et al. [86], these types of studies allow for the measurement of the level of relationship between independent and dependent variables; they generate the behaviors of a population during a single moment without considering

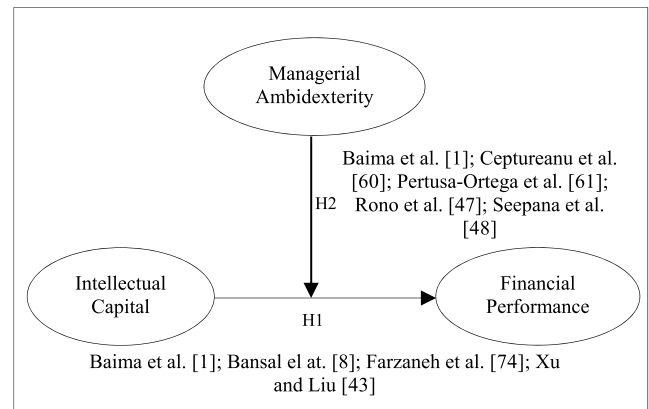


FIGURE 1. Principal conceptual model.

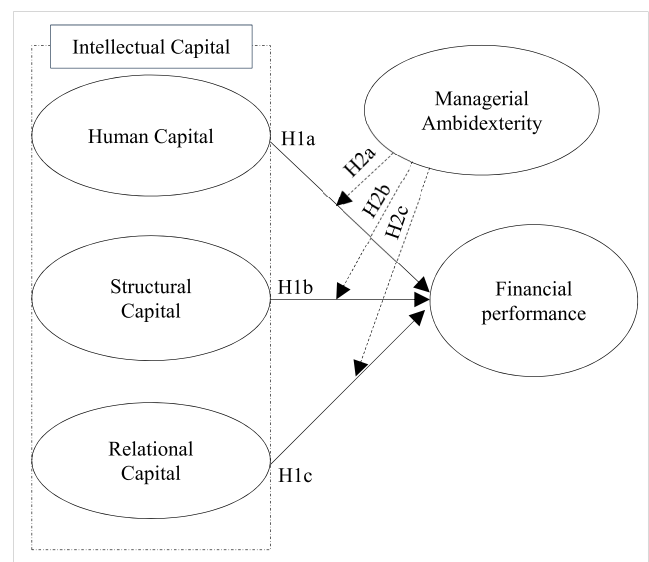


FIGURE 2. Second conceptual model.

whether the behavior changes over time. The survey was sent to 575 managers from whom a response rate of 93.2% was obtained. Therefore, the sample consisted of 536 owner-managers of small, formal, private manufacturing firms operating in Lima and Callao, Peru, associated with the Lima Chamber of Commerce. These locations were chosen because they contain more than 60.6% of the small manufacturing firms in Peru [87].

The sample size was determined based on Kline’s [88] proposal that a sample should consist of a minimum of 10 or 20 observations for each observable variable included in the model. Therefore, it was necessary to collect a minimum of 460 responses. To ensure that participants were selected randomly, we employed probability sampling; 536 owner-managers of small manufacturing firms in Peru participated. This business sector was considered because, according to Smrity and Das [9], manufacturing companies are considered to be one of the most knowledge-intensive and fast-growing sectors. A total of 30 responses were discarded owing to inconsistencies in their responses, with 506 surveys

remaining for the final statistical analyses, representing 94.4% of the valid questionnaires in the study.

The questionnaire consisted of the following sections: (a) informed consent, (b) demographic data, (c) instructions, and (d) questions. Regarding the 46 questions, the IC dimension consisted of 26 items obtained from Asiaei and Jusoh [89], the FP dimension included six questions obtained from Wang et al. [90], and the MA dimension contained 14 questions (seven for exploration and seven for exploitation) obtained from Mom et al. [82]. All questions were quantified using a five-point Likert scale, where five represents strongly agreeing and one represents strongly disagree. According to Wang et al. [90], Likert scales allow for statistical analysis of the qualitative variables that compose a construct and, thus, identify with certainty the attitudes and opinions of a research subject. (See Appendix).

The questionnaire was administered by an expert market research company and sent by e-mail to each owner-manager for completion. Data confidentiality and anonymity were also ensured. Finally, the data collected from 506 owner-managers were processed using convergent and discriminant validity and analyzed using structural equation modelling (SEM) to determine the acceptance or rejection of the hypotheses put forward in the hypothesized model. According to Hair et al. [91], structural equations are multivariate statistical models that estimate the effects and relationships between variables. SPSS 27 and AMOS 24 were used for all analyses, and following the guidelines of Hoyos-Vallejo et al. [92], the convergent and discriminant validity and acceptance or rejection of the hypotheses of the model were determined.

## IV. RESULTS

### A. SAMPLE CHARACTERISTICS

The study involved 506 owner-managers of small manufacturing companies in Peru; 50% of participants had higher technical education, and the majority (51%) were in the 36–50 years age range. The prevalence of male managers (78%) was noticeable, and the majority (36%) of the responses were obtained from the metal-mechanic industry. Finally, most companies (94%) are based in Lima. Table 1 presents the demographic characteristics of the participants.

### B. EXPLORATORY FACTOR ANALYSIS (EFA)

The Kaiser-Meyer-Olkin (KMO) test yielded a value of 0.962, while Bartlett's test of sphericity yielded a chi-square value of 42.823 and a significance level of 0.000 ( $p < 0.05$ ), which are accepted within the academic community [89], [93], [94]. Similarly, the total variance explained showed that the study items were grouped within the correct dimensions with a percentage of 69.83%, a value that exceeded the 60% recommended by Streiner [95]. Finally, to determine whether the items were correctly grouped within their respective dimensions, a rotated component matrix was created [96], [97]. The matrix showed that the 46 items included in the study were grouped correctly within their corresponding constructs.

**TABLE 1. Demographic characteristics of the sample.**

Characteristics	Category	<i>n</i>	%
Education level	Secondary	37	7
	Superior technical (Technical careers)	255	50
	Superior university (Professional careers)	189	37
	Masters or above	25	5
Age	18 to 35 years	23	5
	36 to 50 years	257	51
	51 to 65 years	213	42
	65 years and above	13	3
Gender	Male	396	78
	Female	110	22
Type of manufacturing industry	Chemical	84	17
	Wood and furniture	29	6
	Textiles and leather	112	22
	Food	98	19
City	Metal-mechanic	183	36
	Lima	475	94
	Callao	31	6

Note:  $n=506$

### C. THE MEASUREMENT MODEL

The measurement model comprised three constructs (IC, FP, and MA), and was tested using CFA. It is necessary to determine reliability and convergent validity using Cronbach's alpha values  $\geq 0.7$ , composite reliability  $\geq 0.7$ , and average variance extracted (AVE)  $\geq 0.5$  [96], [98], [99]. As Hair et al. [100] and Hair et al. [101] stated, convergent validity can be confirmed when the AVE scores are  $> 0.50$ , and the composite reliability (CR) is greater than the AVE (see Table 2).

To test the robustness of the data, normality tests were initially developed with separate samples, and once it was identified that the data were abnormal, the levels of correlation between the variables were determined, and their viability was tested through a correlation test. discriminant validity. To determine the discriminant validity, it was necessary to compare the square root of the AVE values of each construct with the values of the correlations of each pair of constructs in the model. According to Chin [102], Hair et al. [101], and Heale and Twycross [103], discriminant validity is corroborated when the square root values of AVE (SR AVE) are greater than the correlations between each pair of constructs (see Table 3).

Based on the analysis presented in Tables 2 and 3, we determined that this study met the criteria for convergent and discriminant validity [100] of the model, and continued with its analysis using structural model analysis.

### D. MODEL SPECIFICATION

The SEM was developed using the maximum likelihood method to determine the acceptance or rejection of the

**TABLE 2. Determinants of the measurement model used.**

Construct	Item	Factor Score	Cronbach's Alpha	CR	AVE
<b>Intellectual Capital (IC)</b> HC= Human Capital RC= Relational Capital SC= Structural Capital	HC1	.934	.991	.988	.785
	HC2	.919			
	HC3	.936			
	HC4	.919			
	HC5	.912			
	HC7	.825			
	RC1	.897			
	RC2	.889			
	RC3	.862			
	RC4	.886			
	RC5	.863			
	RC6	.908			
	RC7	.883			
	RC8	.889			
	RC10	.890			
	SC1	.889			
	SC2	.885			
	SC3	.878			
	SC4	.889			
SC5	.850				
SC7	.806				
SC8	.891				
SC9	.869				
<b>Financial Performance (FP)</b>	FP1	.882	.975	.930	.728
	FP2	.872			
	FP3	.850			
	FP4	.858			
	FP6	.801			
	FP6	.801			
<b>Managerial Ambidexterity (MA)</b> EXPT = Exploitation EXPR = Exploration	EXPT1	.936	.985	.980	.803
	EXPT2	.919			
	EXPT3	.900			
	EXPT4	.917			
	EXPT5	.906			
	EXPT7	.865			
	EXPR1	.878			
	EXPR2	.888			
	EXPR3	.857			
	EXPR4	.890			
	EXPR5	.877			
EXPR6	.917				
<b>Total Alpha = .981</b>					
<b>Measurement secondary model:</b> HC (Alpha: .972; CR: .966; AVE: .825) - RC (Alpha: .976; CR: .970; AVE: .784) - SC (Alpha: .967; CR: .961; AVE: .757)					

**TABLE 3. Discriminant validity of the model.**

	F1	F2	F3	F1a	F1b	F1c	AVE Root <sup>2</sup>	Mean	SD
<b>F1</b>	.785 <sup>a</sup>						0.88	3.67	0.79
<b>F2</b>	.361 <sup>**</sup>	.803 <sup>a</sup>					0.89	3.86	0.67
<b>F3</b>	.441 <sup>**</sup>	.563 <sup>**</sup>	.728 <sup>a</sup>				0.85	3.82	0.73
<b>F1a</b>	.894 <sup>**</sup>	.378 <sup>**</sup>	.463 <sup>**</sup>	.825 <sup>a</sup>			0.90	3.63	0.77
<b>F1b</b>	.864 <sup>**</sup>	.363 <sup>**</sup>	.459 <sup>**</sup>	.876 <sup>**</sup>	.784 <sup>a</sup>		0.88	3.72	0.80
<b>F1c</b>	.853 <sup>**</sup>	.366 <sup>**</sup>	.455 <sup>**</sup>	.859 <sup>**</sup>	.866 <sup>**</sup>	.757 <sup>a</sup>	0.87	3.66	0.81
<i>Note.</i> F1: Intellectual Capital, F2: Managerial Ambidexterity, F3: Financial Performance. F1, F2, and F3 had significant correlation at bilateral level p<0.01; <sup>a</sup> Correlation is significant at p < 0.01 (bilateral). F1a: Human Capital, F1b: Relational Capital, F1c: Structural Capital. F1a, F1b, and F1c with F3 had significant correlation at bilateral level p<0.01; <sup>**</sup> Correlation is significant at p < 0.0; <sup>a</sup> : AVE									

hypotheses. To calculate the moderating effect of MA on the relationship between the latent, exogenous, and endogenous variables, Ng and Chan [104] conducted calculations in two

**TABLE 4. Hypothesis testing results.**

<b>Hypothesis testing of the main model</b>				
Hypotheses	Relationship	B	p-value	Decision
H1	IC-FP	0.260***	***	Accepted
H2	IC-MA-FP	0.085***	***	Accepted
<b>Hypothesis testing of the secondary model</b>				
Hypotheses	Relationship	B	p-value	Decision
H1a	HC-FP	0.064	.279	Rejected
H1b	SC-FP	0.108***	***	Accepted
H1c	RC-FP	0.144***	***	Accepted
<i>Note: direct effect of IC dimensions on FP</i>				
H2a	MA(HC-FP)	0.266	0.139	Rejected
H2b	MA(SC-FP)	0.288***	***	Accepted
H2c	MA(RC-FP)	0.306***	***	Accepted

*Note:* moderating effect of ambidexterity on the relationship between IC dimensions and FP.  
*Note:* Goodness of fit indices:  $\chi^2$  (df) = 2195.845 (692),  $\chi^2/df$  = 3.173, NFI = 0.949, GFI = 0.964, TLI = 0.960, CFI = 0.964, RMSEA = 0.066, \*\*\*p < 0.01 Intellectual Capital (IC), Financial Performance (FP), and Managerial Ambidexterity (MA). Human Capital (HC), Structural Capital (SC), Relational Capital (RC)

stages using regression and Bartlett methods. The regression method calculated the factor score of the independent variable, whereas the Bartlett method calculated the factor score of the dependent variable.

Subsequently, the relationships between the three variables, which were part of the hypothesized model, were examined. Furthermore, the results determined by the maximum likelihood estimation showed that the data met the goodness-of-fit indices:  $\chi^2$  (df) = 2195.845 (692),  $\chi^2/df$  = 3.173, NFI = 0.949, IFI = 0.964, TLI = 0.960, CFI = 0.964, RMSEA = 0.066 [100], [105], [106]. After examining the relationships between the variables in the hypothesized model, two hypotheses were confirmed. The estimated values obtained using SPSS 27 and AMOS 24 enabled us to determine that IC ( $\beta$  = 0.260\*\*\*) influences FP. We determined that MA ( $\beta$  = 0.085\*\*\*) moderates the relationship between IC and FP. Furthermore, it was found that HC ( $\beta$  = 0.064) had no direct relationship with FP, and neither did MA ( $\beta$  = 0.266) moderate the relationship between HC and FP, as opposed to the indicated study that proved that SC ( $\beta$  = 0.108\*\*\*) and RC ( $\beta$  = 0.144\*\*\*) are directly and positively related to FP, whereas MA moderates the relationship between SC and FP ( $\beta$  = 0.288\*\*\*) as well as RC and FP ( $\beta$  = 0.306\*\*\*). See Table 4 and Figure 3 and 4 for details.

**V. DISCUSSION**

This study addresses the interaction between IC and FP by considering MA as a moderating variable. The analysis developed was based on Intellectual Capital Theory, citing relevant studies such as those of Bontis [62], Bontis [107] and Edvinsson and Malone [14]. We then compare and discuss the findings with the previous literature, highlighting the importance of IC management and MA in improving FP in emerging markets. This approach provides new insights into how IC elements, under the influence of MA, impact FP [24], [71], [103].

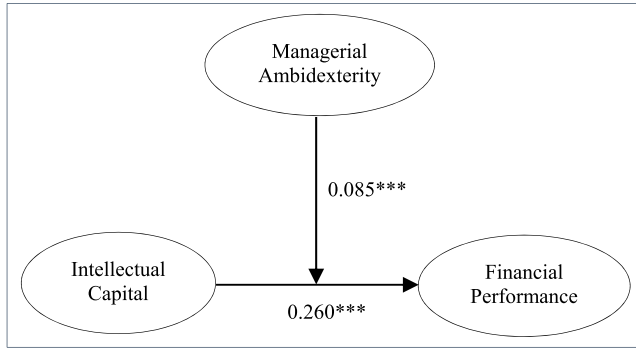


FIGURE 3. Results of the hypothesised principal model.

IC and FP have been gaining relevance within business contexts, particularly during the last 20 years, and a review of the literature shows several discrepancies in their relationship. This study first determines the relationship between IC and FP, followed by the moderating effect of MA on the relationship between IC and FP in Peruvian firms. Statistical analyses revealed that IC had a positive and significant relationship with FP ( $\beta = 0.260^{***}$ ); therefore, H1 was accepted. This finding highlights the significant influence of IC dimensions (HC, SC, and RC) on FP in Peruvian firms. Considering the above, this study corroborates the determination that IC influences FP, thus supporting research findings that IC has a direct and positive impact on FP [6], [7], [21], [25], [26], [27], [28], [29], [32], [73], and that it is a highly significant intangible resource in the small business context [1], [6], [8], [17]. In contrast, Anghel et al. [34] and Kehelwalatenna [35] found a negative relationship between IC and FP, indicating that CI is not a relevant factor in the improvement of PF.

Regarding the direct relationship between IC dimensions and FP, statistical analyses showed that the relationship between HC and FP lacked statistical significance ( $\beta = 0.064$ ,  $p = 0.279$ ), suggesting that HC, as an independent dimension of IC, does not directly influence the FP of small manufacturing companies. Therefore, H1a is rejected; consequently, HC has no direct or positive relationship with FP, thus proving that the knowledge, skills, and attitudes of human talent do not influence the FP of an organization. This finding supports Chowdhury et al. [17], who found that HC does not influence organizational performance, but successfully influences turnover and return on assets. However, it contradicts the findings of previous research, which indicate that the competencies, knowledge, skills, attitudes, innovation, commitment, wisdom, and experience of a firm’s human talent play an essential role in its organizational performance and FP [17], [40], [68], [108], [109], [110].

The results showed that SC is significantly related to FP ( $\beta = 0.108^{***}$ ); thus, H1b is accepted. Therefore, SC has a direct and positive relationship with FP, corroborating that a manager’s ability to manage organizational resources that assist in the transmission and storage of a company’s intellectual material has a direct influence on FP. This finding aligns with those of several studies that have shown that

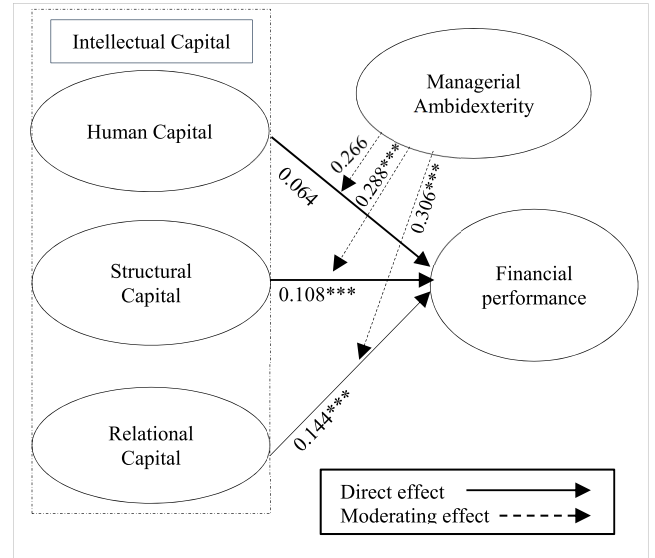


FIGURE 4. Results of the hypothesised secondary model.

SC has a positive and significant influence on FP over time [89], [108], [111], [112]. This supports the notion that organizational procedures, company brands, routines, capabilities, databases, hardware, software, information systems, copyrights, and patents, among others, are indispensable for achieving adequate FP [22], [69]. On the other hand, this result contradicts research that determined that internal organizational resources such as databases, organizational culture, and intellectual property are not factors that condition the PF of companies [26], [41].

Finally, the statistical analyses identified a significant and positive relationship between RC and FP ( $\beta = 0.144^{***}$ ), which accepts H1c; therefore, RC has a direct and positive relationship with FP. This contradicts the statement that RC does not affect FP [17], [108] and supports the determination that relationships external to the organization promote the ability to create value through stakeholders. This corroborates research findings that show a significant and positive association between RC and FP and that internal and external relationships generate value [110], [113], enhance corporate image and reputation, and promote brand loyalty [1], [4], [6].

Statistical analyses demonstrated that MA has a positive and significant moderating effect ( $\beta = 0.085^{***}$ ) on the relationship between IC and FP, whereby H2 is accepted. Thus, ambidexterity has a significantly positive moderating effect on the relationship between IC and FP. This supports the determination that the effect of a firm’s resources on its performance must be orchestrated, and therefore, it depends on its management [1], [8], [9], [18], [48], [55], [56], [59], [61], [80], [114], [115]. This also supports the findings of other studies, demonstrating that managerial ambidexterity moderates the relationship between business-related variables [20], [47], [48], [60], [83].

The statistical analyses developed to measure the moderating effect of MA on the direct relationship between IC dimensions and FP revealed that MA does not moderate the

relationship between HC and FP ( $\beta = 0.266$ ,  $p = 0.139$ ); therefore, H2a is rejected; therefore, ambidexterity does not moderate the direct relationship between HC and FP. This indicates that MA does not moderate the relationship between the managerial knowledge, skills, competencies, capabilities, and FP of small manufacturing firms in Peru.

The study demonstrated a moderation of ambidexterity in the direct relationship between SC and FP ( $\beta = 0.288^{***}$ ), indicating the acceptance of H2b; therefore, ambidexterity moderates the direct relationship between SC and FP. In essence, MA moderates the intangible assets that help an organization create, store, and transfer knowledge, ultimately improving the FP of small manufacturing companies in Peru.

Finally, this study identified a direct relationship between RC and FP ( $\beta = 0.306^{***}$ ); therefore, H2c is accepted. Ambidexterity moderates the direct relationship between RC and FP, implying that MA moderates the relationships, linkages, and external connections with the FP of small manufacturing firms in Peru.

## VI. CONCLUSION

This is the first study to empirically examine the moderating effect of MA on the relationship between IC and FP; the main proposed model was verified. Essentially, we tested the moderating effect of MA on the relationship between IC and FP in small manufacturing companies in Peru, confirming the acceptance of the two central hypotheses of the proposed model. That is, the study found that IC has a positive and significant influence on FP, indicating that HC, SC, and RC allow small manufacturing companies in Peru to sustain their economic activities in the short, medium, and long term, ensuring adequate FP and, consequently, securing its permanence in the market.

This study also found that the moderating effect of MA on the relationship between IC and FP was statistically significant, supporting the idea that exploitation and exploration activities are essential for adequate FP. In this sense, this study demonstrates that owner-managers of small manufacturing companies in Peru must work efficiently, both individually and collaboratively, to balance various exploitation and exploration activities. Regarding the direct relationships between IC dimensions and FP (secondary model), the study found that HC does not influence FP, whereas SC and RC do. However, the moderation analyses of MA on the relationship between IC dimensions and FP revealed that MA does not moderate the relationship between HC and FP, whereas it moderates the relationship between SC and FP. It also moderates the relationship between RC and FP, in which a higher level of moderation is evident.

The results obtained through this research highlight the importance of efficient IC management in small companies, emphasizing the three fundamental pillars of HC, SC, and RC. In conclusion, small business managers can draw valuable lessons from this research, recognizing that HC, represented by the knowledge, skills, and experiences of employees, is an essential asset that not only drives internal

innovation but also influences FP directly. In parallel, the careful management of SC, which encompasses systems, processes, and intellectual property, is revealed as a key factor in enhancing operational efficiency and, therefore, FP. RC, which focuses on relationships with customers, suppliers, and other stakeholders, has emerged as a critical determinant of business sustainability and long-term growth.

The incorporation of MA as a moderating factor offers a unique perspective, suggesting that a manager's ability to balance exploration and exploitation can significantly modulate the relationship between IC and FP, allowing managers to adopt ambidextrous practices that maximize the benefits derived from their IC, facilitate adaptation to new circumstances, and take advantage of emerging opportunities without compromising existing operational efficiency.

### A. SCIENTIFIC IMPLICATIONS

This study advances theories of IC and the resource-based view by elucidating the nuanced role of MA in moderating the impact of IC on FP. It offers a deeper understanding of how the different components of IC interact with management strategies to influence a company's success.

### B. PRACTICAL IMPLICATIONS

For practitioners, especially small manufacturing firms, the findings highlight the importance of balancing exploitation and exploration strategies through managerial ambidexterity. This knowledge is essential for leveraging IC to improve financial results and to provide a strategic plan for effective resource management.

### C. SOCIAL IMPLICATIONS

Socially, this study highlights the broader impact of IC management and ambidextrous strategies on the sustainability and growth of small manufacturing businesses. This knowledge is vital for economies that depend on the manufacturing sector, as it affects job creation, innovation, and economic development at the community level.

### D. POLICY RECOMMENDATIONS

This study has political significance by elucidating the dynamic interplay between key business factors and their impact on local economic stability. Given the vital role of small businesses in job creation and community economic health, it is essential to understand how intellectual capital and managerial ambidexterity influence financial performance. These findings provide insights into the effectiveness of knowledge management in smaller-scale business environments and lay a foundation for policies encouraging ambidextrous management practices in the small and medium-sized enterprise (SME) sector. Thus, this research contributes not only to academia, but also offers practical insights for policymakers aiming to foster resilience and economic growth locally by strengthening intellectual capital and promoting ambidextrous management in smaller businesses.



TABLE 5. Survey questions

Item	Construct	Search items
<b>Intellectual Capital</b>		
HC1 We select the company's personnel on the basis of their intelligence and creativity.	Human Capital	[89]
HC2 We make the most of the capabilities of the staff.		
HC3 We encourage company managers and staff to share knowledge.		
HC4 Our workers are very experienced in their work and duties.		
HC5 For the most part, our workers are capable of developing new ideas and knowledge.		
HC7 Our workers have higher education, whether technological or university.		
SC1 The information systems of our company facilitate access to important internal information.		
SC2 Our company's processes, systems and procedures support innovation.		
SC3 Knowledge is shared internally and continuous learning is encouraged in our company.		
SC4 We have a relatively high annual investment in innovation.		
SC5 We track and make the most of our intellectual property, such as patents and copyrights.		
SC7 We allocate an annual budget for information technology (for personnel, hardware, software, etc.) that is high enough to provide a quality service.		
SC8 We document our knowledge in manuals, databases, etc.		
SC9 We protect important knowledge and information to prevent losses when key people leave the company.		
RC1 We have customers who are loyal to our products or services.	Relational Capital	[89]
RC2 We are market oriented and customer focused.		
RC3 We manage to satisfy customer needs and demands.		
RC4 We have staff who know our market and the profiles of our customers.		
RC5 We receive all the information possible about the needs of our clients.		
RC6 We have marketing staff who continually meet with customers in order to know their needs.		
RC7 We listen and respond promptly to customer complaints.		
RC8 We maintain good relationships with our suppliers.		
RC10 We maintain long-standing relationships with our major suppliers.		
<b>Financial Performance</b>		
FP1 Our company's return on investment exceeds that of our main competitors.	Financial Performance	[90]
FP2 The performance of our company's assets exceeds that of our main competitors.		
FP3 The profitability on our company's sales is higher than that of our main competitors.		
FP4 Our company's net profitability is higher than that of our main competitors.		
FP6 Our company's growth in sales is better than that of our main competitors.		
<b>Managerial Ambidexterity</b>		
EXPR1 I am looking for new products/services, processes or markets.	Exploration Activities	[82]
EXPR2 I evaluate various options for the company's products/services, processes or markets.		
EXPR3 I focus on renewing the company's products/services or processes.		
EXPR4 I invest time in activities with associated returns or costs that are not yet clear.		
EXPR5 I conduct activities that require a great capacity to adapt on my part.		
EXPR6 I conduct activities that require me to learn new skills or knowledge.		
EXPT1 I carry out activities in which I have accumulated a lot of experience.		
EXPT2 I perform some activities that are routine.		
EXPT3 I carry out activities that serve current customers through existing services/products.		
EXPT4 I invest time in activities that I already know well.		
EXPT5 I perform activities focused mainly on achieving short-term goals.		
EXPT7 I perform activities that clearly conform to company policy.		

Likert scale point used in the study: (5) Strongly agree, (4) Agree, (3) Neither Agree nor Disagree, (2) Disagree, (1) Strongly disagree

## E. LIMITATIONS OF THE STUDY

The main limitation of this study is its use of a random probability sampling approach, which was employed using a population limited to the cities of Lima and Callao in Peru obtained from the Lima Chamber of Commerce (CCL) database. Another limitation arises from the study's results, which may be potentially limited by owner-managers' perceptual measures. Additionally, the use of cross-sectional data provides insights at a specific point in time, but it does not guarantee that managers will maintain the same behavior over time.

## F. RECOMMENDATIONS FOR FUTURE RESEARCH

This study highlights several research gaps, and offers recommendations for future research. This suggests expanding the scope beyond small manufacturing firms to other sectors and conducting comparative analyses of various business groups.

Additionally, it advocates the inclusion of control variables, such as the manager's education level and the gender of the owner-manager, which this study did not address. The impact of environmental dynamism on business decisions is another area that needs to be considered.

Notably, the IC and MA scales were primarily studied in developed and large firms. Hence, a more detailed methodological approach is advised to separately measure and analyze IC dimensions (HC, SC, and RC) and MA dimensions (exploitation and exploration) in the FP of small firms in developing economies. Finally, replicating this study in different sectors and transition economies is recommended to further validate the significance of these relationships.

## G. AUTHOR CONTRIBUTIONS

Each author made an equal contribution to project management, monitoring, visualization, original draft, formal

analysis, research, data curation, methodology, validation, and visualization. All editors approved the manuscript after reading it.

## APPENDIX

See Table 5.

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