Article

Intellectual Capital, Board Diversity, and Firms' Financial Performance: A Complex System Perspective

Yu Gao [1], Xinyu Tian [1] and Jian Xu [2,*]

1   Department of Accounting, School of Business, Qingdao University, Qingdao 266071, China;
    gylyj1108@163.com (Y.G.); 13853154351@163.com (X.T.)
2   School of Economics and Management, Qingdao Agricultural University, Qingdao 266109, China
*   Correspondence: jianxusword@qau.edu.cn

Abstract: The objective of this study is to analyze the impact of intellectual capital (IC) and its components on firm financial performance using data from Chinese agricultural listed companies during 2015–2020. The moderating role of board diversity in the relationship between IC and firm financial performance is also tested. The modified value-added intellectual coefficient (MVAIC) model is used to measure IC, and board diversity is measured by several indicators, such as diversity in gender, experience, professional background, and educational background. The results suggest that the overall IC and only one element (human capital) positively influence firm financial performance. Diversity in gender, professional background, and educational background positively moderate the relationship between IC and financial performance, while experience diversity has a negative moderating effect. Among IC components, experience diversity, and educational background diversity negatively moderate the relationship between human capital and financial performance. In addition, gender diversity and experience diversity have a negative moderating effect on the relationship between physical capital and financial performance, while professional background diversity and educational background diversity have a positive moderating effect. This study can provide some new insights for managers to devise strategies to improve IC performance and strengthen corporate governance in order to achieve sustainable development of the agricultural industry. It also can guide policymakers in making policies to improve IC efficiency and firm performance.

Keywords: intellectual capital; financial performance; board diversity; agricultural listed companies; moderating effect

1. Introduction

The development process of an organization is a continuous accumulation of resources. The form of resources can be tangible or intangible assets. Based on the resource-based theory, when an organization can better utilize resources, it will lead to improved organizational performance and unique competitive advantage [1]. The resources held by enterprises are different, and this heterogeneity in turn determines the differences in the competitiveness of enterprises. A resource is considered valuable if it can meet customer needs [2]. Nowadays, intellectual capital (IC) has become the most significant and irreplaceable resource for enterprises [3–9]. That is, IC, both as a whole and for each of its parts, is highly relevant to the future development of enterprises. With financial support, enterprises can quickly obtain tangible resources through market transactions, while IC, as an intangible resource, needs to be continuously accumulated and cultivated within the enterprise for a long time, which makes it difficult for competitors to imitate.

Most current research on IC concentrates on the manufacturing sector [8,10–14], banking sector [15–20], information technology sector [5,21–23], and pharmaceutical sector [24–27], and less has been done in the area of agriculture except the studies by Siew-Peng and Mohammed [28], Kozera [29], Scafarto et al. [30], Kozera-Kowalska and Baum [31], Xu and

Wang [32], Kozera-Kowalska [33], Xu et al. [34,35], Ivanovic et al. [36], Ovechkin et al. [37], Xu and Zhang [38], Jin and Xu [39], and Balaji and Mamilla [40,41]. The discussion on the crucial function of IC in agricultural companies is still in its nascent stages [33], with a noticeable gap in research focusing on the interplay between IC and agribusiness. China has a large proportion of the rural population, and the government has attached great importance to the development of agriculture [32,42]. As representatives of advanced agricultural productivity, agricultural listed companies play a dominant role in promoting the revitalization of rural industry and increasing farmers' income. However, it was reported that the leading agricultural companies have insufficient investment in IC and modern equipment [43], which hinders their sustainable development. In recent years, the value creation efficiency of IC has decreased in China's agricultural industry [44]. Scafarto et al. [30] emphasized the significant dependence of agribusiness on IC resources. Therefore, a deeper analysis of the value-added efficiency of IC should be carried out in the agricultural field.

Corporate governance refers to the system of rules, practices, policies, laws, and institutions that govern the way a company is directed, managed, and controlled. It encompasses the allocation of power and responsibilities among different stakeholders within the company, as well as the relationships between the company and its external stakeholders. The primary objective of corporate governance is to ensure that the company operates in a transparent, accountable, and responsible manner while balancing the interests of all stakeholders and promoting the long-term success of the business. With the development of Chinese agricultural companies, corporate governance problems have become more and more prominent [45]. The board of directors has long been a subject of significant interest in the field of corporate governance. In recent years, there has been increasing scholarly attention on board diversity [46]. The board of directors consists of five or six members in some agricultural companies, which can easily lead to centralized management. Board diversity can enhance management decision-making by leveraging diverse backgrounds, experiences, perspectives, and expertise among board members [47]. Diversity enables boards to effectively address various challenges and capitalize on opportunities [48]. A diverse board can provide valuable professional advice; for instance, directors with financial expertise can offer recommendations regarding investment strategies and financing decisions. Rajkovic [49] also highlights that a specialized board contributes insights for optimizing corporate investment policies. Furthermore, resource dependence theory posits that a diverse board strengthens the relationships between companies and their stakeholders, such as customers, suppliers, and the government, while facilitating communication exchange. This interaction allows companies to access crucial external information, including capital availability, innovation trends, and technological advancements, which bolsters the company's reputation while expanding investment prospects, introducing capital, and garnering support from government entities. From a company development perspective, the effectiveness of internal control lies in the board of directors, and the effectiveness of the board of directors' governance is directly related to the company's long-term development. In addition, gender diversity is a crucial aspect of board diversity, representing the proportion and influence of different genders within the decision-making layer. As society places increasing emphasis on gender equality and the rise of female leadership, the study of gender diversity in corporate governance has become increasingly important. At present, what is less clear is whether board diversity moderates the relationship between IC and firm performance. Considering the role of board diversity in corporate governance [50,51], it is critical to understand its moderating effect.

In this study, we aim to assess the role of IC and its components in promoting the improvement of financial performance in China's agricultural sector. We also explore the moderating effect of board diversity on the relationship between IC and financial performance. IC is measured through the modified value-added intellectual coefficient (MVAIC) model, and board diversity is measured with four indicators, including diversity

in gender, experience, professional background, and educational background. Multiple regression models are used to do the analyses.

The study contributes to the academics and practitioners in the following aspects. First, it expands the current IC literature by assessing the value creation efficiency of IC and its components in China's agriculture sector that attract little attention from scholars. IC can be regarded as a type of new quality productive force and understanding its role in China's agriculture sector can provide important guarantees for the sustainable development of agricultural companies. Second, it firstly explores the moderating effect of board diversity on the relationship between IC and its components and financial performance, which enriches the relevant literature in corporate governance. As an important factor in corporate governance, the role of board diversity in business operations and strategic decision-making is increasingly recognized. This study links the diversity of the board of directors with IC and reveals its key role in the process of value creation of IC. Finally, the findings might provide fresh insights for management to improve IC performance through effective corporate governance and for government institutions to make relevant policies about investments in IC resources.

This study is organized as follows. Section 2 presents the literature review and proposes the hypotheses. Section 3 presents the methodology followed by Section 4, which shows the results. Section 5 discusses the results. Finally, Section 6 concludes.

2. Literature Review and Hypotheses Development

2.1. IC Definition and Classification

Global scholars have proposed various definitions of IC. Seetharaman et al. [52] defined it as the disparity between the market value and book value of firms. Edvinsson [53] characterized it as knowledge that can be transformed into value. IC is also perceived as a compilation of intangible elements or factors that drive economic benefits [54]. Numerous scholars [4,34,35,39,55–59] have highlighted that the structure of IC components encompasses human capital (HC), structural capital (SC), and relational capital (RC). HC, representing implicit knowledge, pertains to the knowledge, experience, skills, abilities, and attitudes possessed by employees [60]. SC, denoting explicit knowledge, includes patents, licenses, trademarks, systems, and organizational culture [61,62]. SC serves as supportive capital facilitating the effective functioning of HC [63]. RC incorporates business relationships with external stakeholders [64], combining both implicit and explicit knowledge.

2.2. IC and Firms' Financial Performance

The relationship between IC and its components and firm performance has been hotly debated in the past decades with diversified results [4,65]. For example, Chen and Rahman [66] found that IC measured by Pulic [67]'s value-added intellectual coefficient (VAIC) model positively affects the financial performance of Chinese retail firms. Suharman et al. [68] carried out a survey and found that the aggregated IC directly affects the performance of state-owned enterprises. Similarly, the findings of Muftiasa et al. [69] showed that IC can improve the financial performance of telecommunications firms during COVID-19. Using the VAIC model, Siew-Peng and Mohammed [28] found that physical capital and SC determine the financial performance and productivity of Malaysian agricultural firms. Balaji and Mamilla [41] pointed out that HC, RC, and financial capital are important in determining the sustainable growth of Indian agribusiness companies. Using the MVAIC model, Rana and Hossain [59] reported a positive relationship between tangible capital, IC, and HC and firm performance and a negative relationship between RC and firm performance in Bangladesh. Nguyen [70] discovered that IC components improve firms' financial performance in the service sector, with HC being the greatest contributor. Tong and Saladrigues [71] used data from new Spanish firms and also found the same results. For Russian manufacturing firms, Skhvediani et al. [23] found that investments in IC and its components (HC and SC) lead to high firm performance. In addition, they

found that the impact of HC and SC is lower than the impact of tangible capital. Taking banks in Vietnam as the sample, Nguyen et al. [19] argued that IC and its elements (HC and SC) have a positive impact on bank performance. Tiwari et al. [20] concluded that HC and physical capital have a strong positive impact on Indian bank productivity. According to Zheng et al. [56], SC and RC have a positive impact on bank performance, whereas HC has a negative impact. However, Naushad and Faisal [72] found that IC investment significantly boosts firm profitability and productivity, while IC components fail to influence productivity in Saudi Arabia. A recent study by Kim and Tran [73] showed an insignificant relationship between HC and SC and the business performance of Vietnamese small and medium enterprises (SMEs).

The important role of IC in agricultural companies can be manifested in the following aspects. First, IC can improve employee capabilities. Effective training and incentive mechanisms can stimulate the creativity of employees and help agricultural companies achieve value creation [30]. Second, IC can promote technological innovation and improve productivity. Employees of agricultural companies can introduce new technologies into agricultural production through human and innovation capitals [38], thus improving production efficiency and reducing production costs. In addition, the agricultural industry has seasonal and cyclical characteristics and is greatly affected by factors such as weather and natural disasters [32]. Agricultural companies need to rely on their employees' IC to cope with various complex production environments and market changes. Third, IC can promote management innovation and help agricultural companies optimize resource allocation, improve management efficiency, and reduce operational risks through investment in SC. Fourth, IC can achieve industry chain control. Agricultural companies can integrate and optimize their supply chain by establishing and maintaining RC with suppliers and partners [34]. This cooperative relationship can ensure a stable raw material supply and reduce procurement costs. By establishing long-term and cooperative relationships with retailers, agricultural companies can better understand market demand and consumer preferences. Therefore, we come to the following hypotheses:

Hypothesis 1 (H1). *IC has a positive impact on firms' financial performance in the agricultural sector.*

Hypothesis 1a (H1a). *HC has a positive impact on firms' financial performance in the agricultural sector.*

Hypothesis 1b (H1b). *SC has a positive impact on firms' financial performance in the agricultural sector.*

Hypothesis 1c (H1c). *RC has a positive impact on firms' financial performance in the agricultural sector.*

2.3. The Moderating Role of Board Diversity

In this study, board diversity refers to the variation in gender, experience, professional background, and educational background among board members. It encompasses the heterogeneity of individual personality traits, gender representation, attitudes, backgrounds, or experiences within an organization [74]. A diverse composition of a board of directors leads to cognitive and decision-making disparities among individuals. These disparities subsequently impact various aspects of enterprise operations, such as investment in research and development (R&D), organizational culture, decision-making efficiency, and resource acquisition. Ultimately, they influence the relationship between IC and firm performance.

The composition of the board of directors is typically characterized by a male-dominated structure, with active participation from female directors who contribute diverse perspectives and promote increased interaction among members [75]. This dynamic enhances the quality and efficiency of corporate governance [76]. Consequently, it facilitates a better understanding and utilization of IC, ultimately leading to improved financial performance.

Additionally, women's participatory management style emphasizes long-term priorities and investments in intangible assets such as employee knowledge, organizational culture, and patents [77]. Therefore, gender diversity on the board can heighten awareness regarding IC in terms of R&D investment while further stimulating its creation for a greater competitive advantage in improving corporate financial performance [78].

Based on the imprinting theory, specific environments have a substantial impact on individuals and organizations by shaping long-lasting imprints that are difficult to eliminate. During decision-making processes, diverse individual experiences among board members lead to distinctive thinking styles, risk preferences, and professional knowledge [79]. Consequently, this gives rise to psychological biases and behavioral deviations [80]. The deeply ingrained experiences held by board members reflect their firmly established beliefs, which resist change. Furthermore, the varying experiential backgrounds of these individuals may result in cognitive conflicts concerning IC recognition thereby hindering decision-making efficiency while limiting the positive influence of IC on corporate financial performance.

The diversity of professional backgrounds among board members creates essential conditions for the synergy between business capabilities and professional knowledge [81]. Each individual's expertise shapes their unique perspective and approach to problem discovery, proposal, and resolution. Varied professional backgrounds foster increased interaction, sharing, and debate among members [82], thereby enriching discussions and offering more innovative and objective suggestions to enhance decision-making quality. A diverse range of professional background knowledge on the board fosters greater enthusiasm for investing in IC resources, ultimately benefiting corporate financial performance.

The diversity of educational backgrounds among board members has long been a focal point for both domestic and international researchers. Education and academic qualifications serve as indicators of individuals' knowledge resources and values, while directors with diverse educational backgrounds can contribute to companies by facilitating the acquisition and analysis of complex information [83], thereby offering distinct resource advantages. According to the resource-based theory, companies strategically allocate and utilize heterogeneous resources in order to attain and sustain competitive advantages [84]. Hence, diversifying the educational background of board members can expand the company's resource pool, synergize with IC to form unique internal resources, generate value, and enhance financial performance [85].

The diversity of the board of directors has various benefits for agribusinesses, which are summarized as follows. Firstly, board diversity can improve decision-making quality. Diversified board members can provide different experiences, which enables companies to make more comprehensive decisions when facing complex market environments. This diversified decision-making process helps agricultural companies maintain a competitive advantage in a fiercely competitive market. Secondly, board diversity can promote innovation. Diverse board members may have different ways of thinking, industry backgrounds, and innovative experiences. Their communication and collision can help stimulate innovative thinking and promote breakthroughs in core technologies, product innovation, marketing, and other aspects for agricultural listed companies. Thirdly, board diversity can optimize corporate governance. Directors from different backgrounds can provide advice and suggestions on company management, which helps prevent corruption and abuse of power and protect shareholders' interests. Finally, board diversity can help companies tackle the drastic market changes. The agricultural market is influenced by various factors, such as climate, policies, and consumer demand, etc. [32]. Diversified board members have a wider range of resources and network of relationships, enabling them to gain better insights into market dynamics and tackle various challenges. Building upon the above arguments, this study posits H2 along with H2a, H2b, H2c, and H2d.

Hypothesis 2 (H2). *Board diversity plays a moderating role in the relationship between IC and firms' financial performance.*

Hypothesis 2a (H2a). *Gender diversity on the board enhances the positive impact of IC on firms' financial performance.*

Hypothesis 2b (H2b). *Experience diversity on the board hinders the positive impact of IC on firms' financial performance.*

Hypothesis 2c (H2c). *Professional background diversity on the board enhances the positive impact of IC on firms' financial performance.*

Hypothesis 2d (H2d). *Educational background diversity on the board enhances the positive impact of IC on firms' financial performance.*

3. Methodology

3.1. Sample Selection

The sample includes agricultural companies listed on the Shanghai and Shenzhen stock exchanges from 2015 to 2020. During this period, China was undergoing a transformation from traditional agriculture to modern agriculture. Agricultural companies began to emphasize technological innovation, brand building, and market expansion, all of which require substantial support from IC. Therefore, studying the impact of IC on the performance of agricultural listed companies during this period holds significant importance for driving the transformation and upgrading of agricultural companies. The study excludes companies due to the issuance of other shares and lack of data, delisted companies, and special treatment (ST) companies. Finally, 40 companies with 213 observations are used for further analyses. The average revenue of these companies reaches 4 billion yuan, and the average total assets are nearly 6 billion yuan. They are leading agricultural companies and can become the representatives of China's agriculture. The data are gathered from the CSMAR database and the Wind database. Stata Version 17 is used to do the analyses.

3.2. Variables

(1) Dependent variable. Based on previous literature [4,7,21,25,26,32,36,39,43,55,69,70], in this study, return on assets (ROA) is used as the primary measure of financial performance, and return on equity (ROE) is used as an alternative indicator in the robustness check.

(2) Independent variables. How to accurately assess IC has become an urgent task for practitioners [4]. In the extant IC literature, the MVAIC model is widely adopted by many researchers to assess IC [4,35,39,55–59], which is the modification of Pulic [67]'s VAIC model. Compared with the VAIC model, it introduces a more detailed classification of IC. In addition, the MVAIC model is likely to have stronger explanatory and predictive power for corporate performance [38]. The calculation processes are shown in Figure 1.

The MVAIC model divides enterprise resources into IC and physical capital, and IC is divided into HC, SC, and RC. Then, the value-added efficiency of each capital is calculated. Finally, the summation of HC, SC, and RC with the supplementation of physical assets can comprehensively assess the level of value-added achieved by enterprises through IC.

(3) Moderators. Guided by Kang et al. [86], we use board diversity in gender, experience, professional background, and educational background as several measures of board diversity. They are measured using the Blau's index [87].

$$D = 1 - \sum P_i^2 \qquad (1)$$

where P is the proportion of individuals in a category and i is the number of categories. If D takes the value of 1, it indicates that the population is perfectly diverse. If D takes the value of 0, it suggests that the population is perfectly homogeneous.
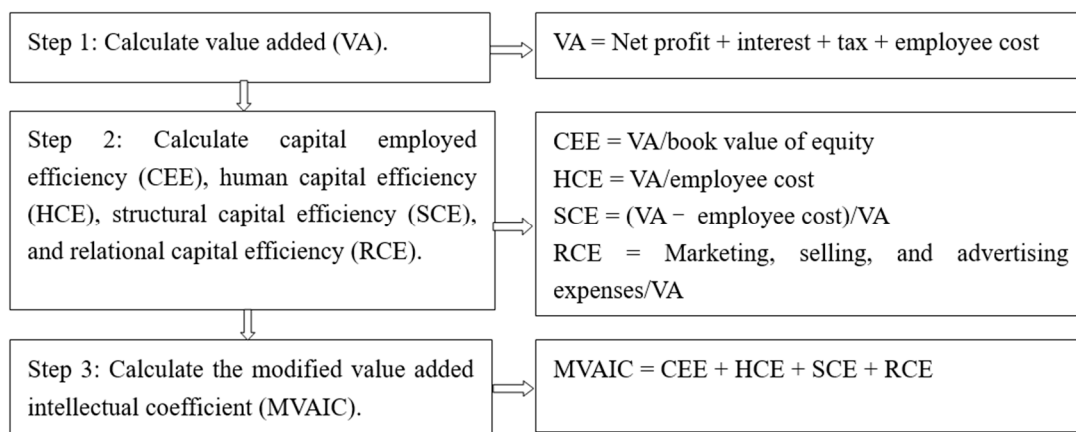
| Step 1: Calculate value added (VA). | ⟹ | VA = Net profit + interest + tax + employee cost |

| Step 2: Calculate capital employed efficiency (CEE), human capital efficiency (HCE), structural capital efficiency (SCE), and relational capital efficiency (RCE). | ⟹ | CEE = VA/book value of equity HCE = VA/employee cost SCE = (VA − employee cost)/VA RCE = Marketing, selling, and advertising expenses/VA |

| Step 3: Calculate the modified value added intellectual coefficient (MVAIC). | ⟹ | MVAIC = CEE + HCE + SCE + RCE |

Figure 1. The calculation processes of IC.

Gender diversity (D1) takes a value of 1 if the board member is female and 2 if the board member is male. Next, the Blau's index is calculated. The higher the indicator, the more diversified the company's board members. Experience diversity (D2) is measured by whether board members serve in the shareholder companies. It takes a value of 1 if they serve in the shareholder companies and 0 otherwise. Next, the Blau's index is applied. The higher this indicator, the higher the board members' experience of diversity. Professional background diversity (D3) is measured via the diversity in board members' majors. In this study, we classify majors into five areas, namely economics or finance, management, accounting, law, and others, with the values of 1, 2, 3, 4, and 5. The value of 6 is assigned if the major is a missing value. The higher the indicator, the more diversified the board members' majors. Educational background diversity (D4) is measured by the board members' graduation institutions, following Bernile et al. [88]. The higher the indicator, the richer the board member's educational experience.

Control variables. According to Xu and Li [4], Xu and Wang [11,32], Xu et al. [34], and Xu and Zhang [38], company scale (SIZE), debt ratio (LEV), gross domestic product growth rate (GDP) are used. In addition, a year dummy (Year) is also included in the regression models. Table 1 presents the variable definition.

Table 1. Variable definition.

Variable	Symbol	Measurement
Return on assets	ROA	Net profit/average total assets
Return on equity	ROE	Net profit/average shareholders' equity
Modified value-added intellectual coefficient	MVAIC	CEE + HCE + SCE + RCE
Capital employed efficiency	CEE	VA/book value of equity
Human capital efficiency	HCE	VA/employee cost
Structural capital efficiency	SCE	(VA − employee cost)/VA
Relational capital efficiency	RCE	Marketing, selling, and advertising expenses/VA
Gender diversity	D1	$D1 = 1 - \sum P_i^2$
Experience diversity	D2	$D2 = 1 - \sum P_i^2$
Professional background diversity	D3	$D3 = 1 - \sum P_i^2$
Educational background diversity	D4	$D4 = 1 - \sum P_i^2$
Company scale	SIZE	Natural logarithm of total assets

Table 1. *Cont.*

Variable	Symbol	Measurement
Debt ratio	LEV	Total liabilities/total assets
Gross domestic product growth rate	GDP	(Current year's gross domestic product − last year's gross domestic product)/last year's gross domestic product
Year dummy	Year	Dummy variable that takes 1 for the test year and 0 otherwise

3.3. Models

In this study, multivariate regression is used to establish the relationship between IC and its components and firms' financial performance.

$$\text{ROA}_{it} = \beta_0 + \beta_1 \text{IC\_COMPONENTS}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{LEV}_{it} + \beta_4 \text{GDP}_{it} + \sum \text{Year} + \varepsilon_{it} \quad (2)$$

The following model is used to test the moderating effect of board diversity in the relationship between IC and its components and firms' financial performance.

$$\text{ROA}_{it} = \beta_0 + \beta_1 \text{IC\_COMPONENTS}_{it} + \beta_2 \text{DIVERSITY}_{it} + \beta_3 \text{IC\_COMPONENTS}_{it} \times \text{DIVERSITY}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{LEV}_{it} + \beta_6 \text{GDP}_{it} + \sum \text{Year} + \varepsilon_{it} \quad (3)$$

where IC_COMPONENTS include MVAIC, HCE, SCE, and RCE; DIVERSITY includes D1, D2, D3, and D4; i represents the firm; t represents the year; ε is the term error.

4. Results

4.1. Descriptive Statistics

The descriptive statistics of the variables are presented in Table 2. For the sampled companies, ROA ranges from −0.431 to 0.675, with a standard deviation of 0.109. This indicates significant variation in asset return rates among different companies, with some exhibiting higher returns. Similarly, the MVAIC varies noticeably among such companies, ranging from −18.348 to 43.838, aligning with the existing research findings on the differences in IC across firms [4,32]. Among IC components, it is noticeable that HC produces more wealth than SC and RC, which accords with the findings of Xu and Wang [32], Xu et al. [34], Ivanovic et al. [36], Xu and Zhang [38], and Jin and Xu [39]. The combined mean value of HCE, SCE, and RCE is much greater than that of CEE, indicating that intangibles have a dominating role than tangibles. Notably, RC exhibits the highest standard deviation among the components of IC, suggesting substantial variations between companies and potential for further development and utilization. Furthermore, all moderator variables have minimum values of 0, indicating no differences in board diversity among certain companies. In addition, SIZE has a mean value of 21.950. The mean value of LEV (0.415) suggests that agricultural companies maintain good capital structure.

Table 2. Descriptive statistics.

Variable	N	Mean	Maximum	Minimum	Standard Deviation
ROA	213	0.031	0.675	−0.431	0.109
MVAIC	213	2.805	43.838	−18.348	4.027
CEE	213	0.202	6.183	−1.088	0.472
HCE	213	1.651	8.430	−10.796	1.850
SCE	213	0.102	29.031	−49.982	4.692
RCE	213	0.851	93.801	−9.621	6.843
D1	213	0.261	0.5	0	0.168

Table 2. *Cont.*

Variable	N	Mean	Maximum	Minimum	Standard Deviation
D2	213	0.265	0.5	0	0.202
D3	213	0.450	0.903	0	0.245
D4	213	0.359	0.988	0	0.294
SIZE	213	21.950	25.532	19.481	1.031
LEV	213	0.415	0.980	0.054	0.188
GDP	213	0.058	0.070	0.022	0.018

4.2. Correlation Analysis

Correlation results are listed in Table 3. The results presented in Table 3 demonstrate a statistically significant positive correlation between IC and financial performance at the 1% significance level, providing initial support for the proposition that IC enhances financial performance. As for IC components, ROA is correlated with only HC. D2 is negatively correlated with ROA, whereas D3 is positively correlated. In addition, we calculate the values of variance inflation factor (VIF) with all less than 3, which suggests that our study does not suffer serious multi-collinearity problems. To ensure more robust research findings and explore the potential moderating effect of board diversity on the relationship between IC and firm financial performance, further regression analysis is warranted.

Table 3. Correlation matrix.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1 ROA	1												
2 MVAIC	0.387 ***	1											
3 CEE	0.295 ***	0.203 ***	1										
4 HCE	0.801 ***	0.441 ***	0.278 ***	1									
5 SCE	0.058	−0.286 ***	0.009	0.056	1								
6 RCE	−0.049	0.651 ***	−0.031	−0.068	−0.870 ***	1							
7 D1	0.027	−0.052	0.009	−0.017	0.181 ***	−0.151 **	1						
8 D2	−0.205 ***	−0.045	0.009	−0.081	−0.098	0.062	0.009	1					
9 D3	0.170 **	−0.069	−0.075	0.132 *	0.113	−0.148 **	0.102	−0.075	1				
10 D4	0.052	−0.073	−0.046	0.059	0.106	−0.129 *	0.250 ***	0.177 ***	0.672 ***	1			
11 SIZE	0.288 ***	0.106	0.099	0.221 ***	0.091	−0.066	0.041	−0.035	0.195 ***	0.377 ***	1		
12 LEV	−0.298 ***	−0.112	0.240 ***	−0.111	0.107	−0.126 *	−0.111	0.068	−0.077	0.032	0.150 **	1	
13 GDP	−0.067	0.086	−0.137 **	0.026	−0.004	0.056	−0.050	0.013	0.010	−0.060	−0.045	0.010	1

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.3. Regression Results

The results in Table 4 present the regression analysis findings of IC and firm financial performance. In column (1), the coefficient of IC on firm financial performance is determined to be 0.009, which passes the significance test at the 1% level. This confirms that IC has a positive influence on a company's financial performance and validates H1. To examine the moderating effect of board diversity on the relationship between IC and firm financial performance, we introduce gender diversity (D1), experience diversity (D2), professional background diversity (D3), and educational background diversity (D4) as moderating variables. The regression results in columns (2) to (5) are as follows. From column (2), it can be observed that the interaction MVAIC × D1 has a coefficient of 0.046 and is significant at the 1% level, indicating that gender diversity enhances the promoting effect of IC on firm financial performance. After including the interaction between MVAIC and experience diversity (D2), we find a coefficient of −0.033 with significance at the 1% level, suggesting that board members' experience diversity inhibits the promoting effect of IC on firm financial performance. According to columns (4) and (5), both interaction terms MVAIC × D3 and MVAIC × D4 have coefficients of 0.023 and 0.011, respectively, passing significance tests at the 1% level, confirming that professional diversity and educational background diversity enhance the positive effect of IC on firm financial performance. Based on these regression results, it can be concluded that board diversity plays a moderating role in shaping the relationship between IC and firm financial performance; hence, H2 is validated. In addition, the company scale positively affects the ROA indicator, while the debt ratio has a negative impact.

Table 4. Regression results (independent variable: MVAIC).

Variable	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA
Constant	−0.576 *** (−4.20)	−0.438 *** (−3.37)	−0.547 *** (−4.12)	−0.413 *** (−3.14)	−0.532 *** (−3.66)
MVAIC	0.009 *** (5.59)	0.002 (0.96)	0.019 *** (5.17)	0.002 (1.09)	0.005 *** (2.72)
D1		−0.156 *** (−3.56)			
D2			0.012 (0.27)		
D3				−0.013 (−0.48)	
D4					−0.044 ** (−1.71)
MVAIC × D1		0.046 *** (5.88)			
MVAIC × D2			−0.033 *** (−3.08)		
MVAIC × D3				0.023 *** (5.27)	
MVAIC × D4					0.011 *** (2.71)
SIZE	0.031 *** (5.01)	0.027 *** (4.59)	0.029 *** (4.81)	0.024 *** (3.99)	0.030 *** (4.53)
LEV	−0.176 *** (−5.17)	−0.208 *** (−6.42)	−0.159 *** (−4.80)	−0.176 *** (−5.50)	−0.189 *** (−5.57)
GDP	−0.486 (−1.37)	−0.521 (−1.58)	−0.427 (−1.25)	−0.622 * (−1.87)	−0.594 (−1.69)

Table 4. *Cont.*

Variable	(1)	(2)	(3)	(4)	(5)
	ROA	ROA	ROA	ROA	ROA
Year	Included	Included	Included	Included	Included
N	213	213	213	213	213
Adj. R^2	0.2945	0.3899	0.3437	0.3845	0.3133
F	23.12 ***	23.58 ***	19.51 ***	23.07 ***	17.12 ***

Notes: * $p < 0.1$, ** $p < 0.1$, *** $p < 0.01$. *t*-values are in parentheses.

The results of multiple regression analysis between HC and firm financial performance are presented in Table 5. In column (1), it is observed that the coefficient of HCE on firm financial performance is 0.044, which is statistically significant at the 1% level. This finding supports H1a and suggests that human resources have a positive impact on a company's financial performance. According to the findings in columns (2) to (5), it can be noted that the interaction terms HCE × D2 and HCE × D4 have a negative influence on firm financial performance at the 1% significance level, indicating that board members' diversity in experience and educational background may hinder the enhancing effect of HC on firm financial performance. However, no significant impact on firm financial performance is found for the interaction terms HCE × D1 and HCE × D3, suggesting that gender diversity and professional diversity do not significantly affect the relationship between HC and firm financial performance.

Table 5. Regression results (independent variable: HCE).

Variable	(1)	(2)	(3)	(4)	(5)
	ROA	ROA	ROA	ROA	ROA
Constant	−0.318 *** (−3.56)	−0.329 *** (−3.64)	−0.327 *** (−4.26)	−0.304 *** (−3.30)	−0.407 *** (−4.43)
HCE	0.044 *** (19.30)	0.048 *** (9.89)	0.070 *** (17.95)	0.041 *** (6.15)	0.056 *** (14.21)
D1		0.026 (0.75)			
D2			0.105 *** (3.82)		
D3				0.004 (0.18)	
D4					0.027 (1.43)
HCE × D1		−0.013 (−1.00)			
HCE × D2			−0.096 *** (−7.98)		
HCE × D3				0.005 (0.39)	
HCE × D4					−0.027 *** (−3.81)
SIZE	0.016 *** (4.04)	0.016 *** (4.02)	0.014 *** (4.07)	0.016 *** (3.76)	0.019 *** (4.58)
LEV	−0.138 *** (−6.29)	−0.134 *** (−5.97)	−0.099 *** (−5.14)	−0.137 *** (−6.18)	−0.120 *** (−5.52)

Table 5. *Cont.*

Variable	(1)	(2)	(3)	(4)	(5)
	ROA	ROA	ROA	ROA	ROA
GDP	−0.472 ** (−2.08)	−0.468 ** (−2.05)	−0.318 (−1.63)	−0.476 ** (−2.09)	−0.432 * (−1.96)
Year	Included	Included	Included	Included	Included
N	213	213	213	213	213
Adj. R^2	0.7093	0.7079	0.7876	0.7073	0.7283
F	130.30 ***	86.62 ***	132.05 ***	86.37 ***	95.73 ***

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. *t*-values are in parentheses.

The results of multiple regression analysis presented in Table 6 illustrate the relationship between SC and firm financial performance. Based on the findings reported in column (1), it can be inferred that there is no significant impact of SC on firm financial performance. The results in columns (2) to (5) indicate that none of the interaction terms exhibit statistical significance, suggesting that board diversity does not moderate the relationship between SC and firm financial performance.

Table 6. Regression results (independent variable: SCE).

Variable	(1)	(2)	(3)	(4)	(5)
	ROA	ROA	ROA	ROA	ROA
Constant	−0.638 *** (−4.35)	−0.639 *** (−4.36)	−0.600 *** (−4.15)	−0.620 *** (−4.18)	−0.705 *** (−4.56)
SCE	0.002 (1.04)	0.003 ** (1.79)	−0.003 (−0.98)	0.001 (0.76)	0.002 (1.28)
D1		−0.021 (−0.52)			
D2			−0.095 *** (−2.87)		
D3				0.033 (1.18)	
D4					−0.031 (−1.27)
SCE × D1		−0.012 (−1.54)			
SCE × D2			0.013 (1.54)		
SCE × D3				−0.0003 (−0.07)	
SCE × D4					−0.002 (−0.59)
SIZE	0.035 *** (5.31)	0.035 *** (5.37)	0.034 *** (5.29)	0.034 *** (4.94)	0.039 *** (5.43)
LEV	−0.205 *** (−5.65)	−0.208 *** (−5.68)	−0.198 *** (−5.53)	−0.200 *** (−5.45)	−0.207 *** (−5.70)
GDP	−0.299 (−0.79)	−0.265 (−0.70)	−0.266 (−0.71)	−0.306 (−0.80)	−0.293 (−0.77)
Year	Included	Included	Included	Included	Included
N	213	213	213	213	213

Table 6. *Cont.*

Variable	(1)	(2)	(3)	(4)	(5)
	ROA	ROA	ROA	ROA	ROA
Adj. R^2	0.1929	0.1960	0.2215	0.1905	0.1927
F	13.66 ***	9.61 ***	11.06 ***	9.32 ***	9.43 ***

Notes: ** $p < 0.1$, *** $p < 0.01$. *t*-values are in parentheses.

The results of multiple regression analysis presented in Table 7 illustrate the relationship between RC and firm financial performance. In column (1), the coefficient of RCE on ROA is −0.001, but it fails to reach statistical significance, indicating that RC does not exert a significant influence on firm financial performance. To investigate the potential moderating effect of board diversity, this study further incorporates various moderating variables, as depicted in columns (2) to (5). However, none of the coefficients for interaction terms are statistically significant, suggesting that board diversity does not play a moderating role in the relationship between RC and financial performance.

In robustness check, ROE is used as an alternative to firm financial performance to re-estimate all models, and the results are consistent with our previous findings. In addition, we use a 1-year lagged IC and its components to re-estimate all models. The results are similar to previous findings, which proves the robustness of our empirical results.

Table 7. Regression results (independent variable: RCE).

Variable	(1)	(2)	(3)	(4)	(5)
	ROA	ROA	ROA	ROA	ROA
Constant	−0.642 *** (−4.39)	−0.652 *** (−4.44)	−0.611 *** (−4.22)	−0.626 *** (−4.21)	−0.710 *** (−4.61)
RCE	−0.001 (−1.10)	−0.001 (−1.33)	0.004 (0.67)	−0.001 (−0.91)	−0.001 (−1.32)
D1		−0.028 (−0.67)			
D2			−0.085 ** (−2.55)		
D3				0.032 (1.12)	
D4					−0.033 (−1.32)
RCE × D1		0.022 (1.23)			
RCE × D2			−0.013 (−0.82)		
RCE × D3				0.001 (0.13)	
RCE × D4					0.009 (0.76)
SIZE	0.035 *** (5.35)	0.036 *** (5.44)	0.035 *** (5.33)	0.034 *** (4.98)	0.039 *** (5.48)
LEV	−0.206 *** (−5.67)	−0.207 *** (−5.62)	−0.197 *** (−5.49)	−0.201 *** (−5.46)	−0.207 *** (−5.67)
GDP	−0.277 (−0.73)	−0.270 (−0.71)	−0.259 (−0.70)	−0.289 (−0.76)	−0.281 (−0.74)
Year	Included	Included	Included	Included	Included

Table 7. *Cont.*

Variable	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA
N	213	213	213	213	213
Adj. R^2	0.1933	0.1931	0.2161	0.1906	0.1945
F	13.70 ***	9.46 ***	10.74 ***	9.32 ***	9.53 ***

Notes: ** $p < 0.05$, *** $p < 0.01$. *t*-values are in parentheses.

4.4. Additional Analysis

Additionally, we investigated the moderating role of board diversity in the relationship between physical capital and firms' financial performance. The findings are presented in Table 8. Our results align with Xu and Wang [32], Xu and Zhang [38], and Jin and Xu [39], demonstrating that physical capital plays the most pivotal role in value creation. Moreover, our analysis reveals that gender diversity and experience diversity negatively moderate the relationship between physical capital and ROA, while professional background diversity and educational background diversity positively moderate this relationship.

Table 8. Regression results (independent variable: CEE).

Variable	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA
Constant	−0.616 *** (−4.57)	−0.617 *** (−4.60)	−0.418 *** (−4.05)	−0.166 * (−1.76)	−0.324 ** (−2.61)
CEE	0.085 *** (6.20)	0.166 *** (3.55)	0.538 *** (13.66)	0.019 * (1.89)	0.044 *** (3.58)
D1		0.020 (0.45)			
D2			0.125 *** (4.26)		
D3				−0.095 *** (−4.84)	
D4					−0.126 *** (−5.62)
CEE × D1		−0.255 * (−1.81)			
CEE × D2			−1.125 *** (−11.93)		
CEE × D3				0.756 *** (15.86)	
CEE × D4					0.624 *** (9.45)
SIZE	0.033 *** (5.49)	0.033 *** (5.48)	0.020 *** (4.21)	0.012 *** (2.76)	0.021 *** (3.72)
LEV	−0.251 *** (−7.33)	−0.252 *** (−7.35)	−0.164 *** (−6.11)	−0.203 *** (−8.78)	−0.255 *** (−8.90)
GDP	0.007 (0.02)	−0.042 (−0.12)	−0.018 (−0.07)	−0.075 (−0.32)	−0.178 (−0.60)
Year	Included	Included	Included	Included	Included
N	213	213	213	213	213

Table 8. *Cont.*

Variable	(1)	(2)	(3)	(4)	(5)
	ROA	ROA	ROA	ROA	ROA
Adj. R^2	0.3152	0.3208	0.6084	0.6939	0.5188
F	25.40 ***	17.69 ***	55.90 ***	81.09 ***	39.10 ***

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. *t*-values are in parentheses.

5. Discussion

In this study, we found that the aggregated IC can lead to the improved financial performance of Chinese agricultural companies. As an important strategic resource, companies have put more emphasis on investment in IC. This echoes the findings of Xu and Wang [32], Xu and Zhang [38], and Jin and Xu [39]. Among IC components, we find that HC is the most influencing factor for performance enhancement, while SC and RC do not significantly influence the ROA indicator. This is in line with previous literature [32,38,39]. It was reported that companies in China's agricultural sector have begun to improve corporate structure and develop new healthy products to meet customers' demands [43]. Deze et al. [89] confirmed that HC plays a more important role in developing agri-entrepreneurship than SC and RC. Lee et al. [90] found that human, structural, relational, and innovation capitals are the key factors for the implementation of green accounting in agribusiness. According to Paoloni et al. [91], the important roles of HC and RC as two elements of IC are confirmed. Balaji and Mamilla [41] also observed that HC and RC significantly determine the sustainable growth of Indian agribusiness. As per Modaffari et al. [92], RC is important in female agri-start-ups, which in turn improves HC and SC. In addition, it should be noted that tangible assets processed by agricultural companies still play a predominant role in the process of value generation. In knowledge-oriented economic times, agricultural companies should actively adjust their industrial structure and focus on independent innovation capability instead of depending largely on tangible assets.

We first empirically explore the moderating role of board diversity between IC and its components and financial performance. Gender diversity positively moderates the relationship between IC and ROA, while it negatively moderates the relationship between physical capital and ROA. Encouraging females to join the board of directors can help companies tackle difficulties in a prudent way, thus avoiding high risks. Furthermore, female leaders are more sensitive in terms of caring for employees. It is worth noticing that experience diversity has a negative moderating role in the relationship between IC, HC, and physical capital and firm financial performance. On the one hand, the strategic planning and execution of IC rely on consensus and collaboration among board members. When the diversity of board experience is high, members may have differing interpretations of strategy execution, which diminishes the positive effect of IC on corporate performance. On the other hand, the diversity of board experience can lead to disagreements in resource allocation and utilization. Experienced directors with a deeper understanding of industry trends and market dynamics may be more capable of allocating and utilizing resources effectively. In contrast, directors with less experience may struggle to make reasonable decisions regarding resource allocation. This disagreement can result in inefficient IC resource utilization, thus impacting firm performance. Therefore, board members are encouraged to serve for one company, so they can be more familiar with the company's business, thus improving resource utilization efficiencies including IC resources. Professional diversity positively moderates the relationship between IC and physical capital and financial performance. Board members with various majors can help companies make more reasonable decisions. Agricultural products are the focus of agricultural companies, and successfully implementing diversified strategies depends on the board members' knowledge. Finally, the results show that educational background diversity plays a positive moderating role in the relationship between IC and physical capital and firm financial performance, while it negatively moderates the relationship between HC and financial performance. The nega-

tive moderating effect of educational background diversity between HC and ROA could be explained by the fact that employees with diverse educational backgrounds may have differences in thinking patterns and communication styles, which can lead to difficulties in communication and coordination, thus affecting the efficiency of HC.

Table 9 shows a summary of the main conclusions of this study.

Table 9. Conclusion summary.

Variable	IC	HC	SC	RC	Physical Capital
Firm financial performance	+	+	Insignificant	Insignificant	+
Moderating effect of gender diversity	+	Insignificant	Insignificant	Insignificant	−
Moderating effect of experience diversity	−	−	Insignificant	Insignificant	−
Moderating effect of professional diversity	+	Insignificant	Insignificant	Insignificant	+
Moderating effect of educational background diversity	+	−	Insignificant	Insignificant	+

Notes: + means positive impact; − means negative impact.

6. Conclusions

The study focuses on Chinese agricultural listed companies and empirically examines the impact of IC on corporate financial performance as well as the moderating effect of board diversity. The research findings are as follows. Firstly, IC positively influences corporate financial performance. Accumulating intangible assets in terms of IC equips a company with the necessary information and knowledge reserves for its operations, thereby enhancing its financial performance. Secondly, among the three elements of IC, only HC significantly enhances corporate financial performance, while SC and RC have no significant impact, highlighting the predominant role played by HC. Thirdly, board diversity moderates the relationship between IC and corporate financial performance. Specifically, gender diversity, professional diversity, and educational background diversity amplify the promoting effect of IC on corporate financial performance; however, experiential diversity among board members hinders the positive relationship between IC and corporate financial performance.

The theoretical contributions of this study can be summarized as follows. First, it unleashes the power of IC for Chinese agricultural companies, which broadens the current IC literature. Second, this study is one of the pioneers in exploring the moderating role of board diversity in the relationship between IC and its components and firm financial performance, shedding light on how governance structures can shape strategic resources' impact. Finally, the findings offer managers fresh insights into leveraging corporate governance to bolster IC performance, providing actionable strategies for enhancing long-term competitiveness and financial success.

Based on the research findings, we propose the following recommendations. Firstly, agricultural companies should optimize investment and management in IC. IC can enhance a company's sustainable competitiveness and is an irreplaceable strategic resource. Companies should increase their investment in IC to strengthen their core competencies and improve financial performance. Secondly, with regard to IC components, companies should primarily focus on effectively managing and investing in HC. They should enhance talent recruitment efforts and allocate sufficient funds while designing positions rationally and establishing incentive assessment systems. These measures will foster a talent-rich environment that drives innovation and productivity. Meanwhile, they should enhance SC

by optimizing operational processes, information technology (IT) systems, and intangible assets, while strengthening RC through strategic partnerships, customer engagement, and brand reputation management. Thirdly, when making investment decisions, companies should thoroughly consider the composition of the board of directors by appropriately enhancing its diversity. It is crucial to strike a balance between various dimensions of diversity within the board while emphasizing gender diversity as well as diverse professional and educational backgrounds among board members.

This study has several limitations that can guide directions for future research. First, the current study primarily includes Chinese agricultural companies, and future research can extend this investigation to other industries or other countries. Second, future studies can take into account more board diversity variables such as age diversity to deeply explore the moderating role in the relationship between IC and firm performance.

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors upon request.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Amit, R.; Schoemaker, P.J.H. Strategic assets and organizational rent. *Strateg. Manag. J.* **1993**, *14*, 33–46. [CrossRef]
2. Verdin, P.; Williamson, P. Successful strategy: Stargazing or self-examination? *Eur. Manag. J.* **1994**, *12*, 10–19. [CrossRef]
3. Cabrilo, S.; Kianto, A.; Milic, B. The effect of IC components on innovation performance in Serbian companies. *VINE J. Inf. Knowl. Manag. Syst.* **2018**, *48*, 448–466. [CrossRef]
4. Xu, J.; Li, J. The impact of intellectual capital on SMEs' performance in China Empirical evidence from non-high-tech vs. High-tech SMEs. *J. Intellect. Cap.* **2019**, *20*, 488–509. [CrossRef]
5. Zhu, W.; Dai, X.; Tian, Y.; Hu, X.; Chao, Z. How Intellectual Capital Combination Method Can Improve Corporate Performance in China's Information Technology Industry. *IEEE Access* **2020**, *8*, 4824–4837. [CrossRef]
6. Zhang, L.; Yu, Q.; Jin, Z.; Xu, J. Do Intellectual Capital Elements Spur Firm Performance? Evidence from the Textile and Apparel Industry in China. *Math. Probl. Eng.* **2021**, *2021*, 7332885. [CrossRef]
7. Ali, S.; Murtaza, G.; Hedvicakova, M.; Jiang, J.; Naeem, M. Intellectual capital and financial performance: A comparative study. *Front. Psychol.* **2022**, *13*, 967820. [CrossRef] [PubMed]
8. Liu, L.; Zhang, J.; Xu, J.; Wang, Y. Intellectual Capital and Financial Performance of Chinese Manufacturing SMEs: An Analysis from the Perspective of Different Industry Types. *Sustainability* **2022**, *14*, 10657. [CrossRef]
9. Lehenchuk, S.; Zeytinoglu, E.; Hrabchuk, I.; Zhalinska, I.; Oleksich, Z. Nexus Between Intellectual Capital, Financial Performance and Sustainable Growth: Evidence from the Turkish ICT Industry. *Mark. Manag. Innov.* **2023**, *14*, 152–162. [CrossRef]
10. Cisneros, I.M.A.; Hernandez-Perlines, F. Intellectual capital and Organization performance in the manufacturing sector of Mexico. *Manag. Decis.* **2018**, *56*, 1818–1834. [CrossRef]
11. Xu, J.; Wang, B. Intellectual Capital, Financial Performance and Companies' Sustainable Growth: Evidence from the Korean Manufacturing Industry. *Sustainability* **2018**, *10*, 4651. [CrossRef]
12. Xu, J.; Liu, F. Nexus between intellectual capital and financial performance: An investigation of Chinese manufacturing industry. *J. Bus. Econ. Manag.* **2021**, *22*, 217–235. [CrossRef]
13. Çam, İ.; Özer, G. Intellectual Capital and Firm Value: An Investigation of Turkish Manufacturing Companies. *Istanb. Bus. Res.* **2022**, *51*, 257–277.
14. Skhvediani, A.; Koklina, A.; Kudrtavtseva, T.; Maksimenko, D. The Impact of Intellectual Capital on the Firm Performance of Russian Manufacturing Companies. *Risks* **2023**, *11*, 76. [CrossRef]
15. Castro, J.P.G.; Ramírez, D.F.D.; Escobar, J.M. The relationship between intellectual capital and financial performance in Colombian listed banking entities. *Asia Pac. Manag. Rev.* **2021**, *26*, 237–247.
16. Asare, N.; Aboagye-Otchere, F.; Muah, P. Does intellectual capital lead to greater financial performance and stability? Evidence from banking markets in Africa. *Afr. J. Account. Audit. Financ.* **2022**, *8*, 173–195. [CrossRef]
17. Xu, J.; Haris, M.; Irfan, M. The Impact of Intellectual Capital on Bank Profitability during COVID-19: A Comparison with China and Pakistan. *Complexity* **2022**, *2022*, 2112519. [CrossRef]

18. Xu, J.; Haris, M.; Irfan, M. Assessing intellectual capital performance of banks during COVID-19: Evidence from China and Pakistan. *Quant. Financ. Econ.* **2023**, *7*, 356–370. [CrossRef]

19. Nguyen, D.T.; Le, T.D.; Tran, S.H. The moderating role of income diversification on the relationship between intellectual capital and bank performance evidence from Viet Nam. *Cogent Bus. Manag.* **2023**, *10*, 2182621. [CrossRef]

20. Tiwari, R.; Vidyarthi, H.; Kumar, A. Nexus between Intellectual Capital and Bank Productivity in India. *J. Risk Financ. Manag.* **2023**, *16*, 54. [CrossRef]

21. Gupta, K.; Goel, S.; Bhatia, P. An Analysis of Intellectual Capital and Firms' Profitability: With Reference to Indian IT Companies. *NMIMS Manag. Rev.* **2019**, *37*, 77–91.

22. Kulkarni, M.; Bharathi, S.V. Intellectual Capital in Information Technology Companies in India: An Impact Study on Firm Performance. *Int. J. Inf. Syst. Serv. Sect.* **2020**, *12*, 36–59. [CrossRef]

23. Skhvediani, A.; Maksimenko, D.; Maykova, A.; Kudryavtseva, T. Assessment of the Impact of Intellectual Capital on the Profitability of IT Companies in Russia. *Int. J. Technol.* **2022**, *13*, 1558–1567. [CrossRef]

24. Sharabati, A.A.A.; Jawad, S.N.; Bontis, N. Intellectual capital and business performance in the pharmaceutical sector of Jordan. *Manag. Decis.* **2010**, *48*, 105–131. [CrossRef]

25. Anghel, I.; Siminică, M.; Cristea, M.; Sichigea, M.; Noja, G.G. Intellectual Capital and Financial Performance of Biotech Companies in the Pharmaceutical Industry. *Amfiteatru Econ.* **2018**, *20*, 631–646. [CrossRef]

26. Ge, F.; Xu, J. Does intellectual capital investment enhance firm performance? Evidence from pharmaceutical sector in China. *Technol. Anal. Strateg. Manag.* **2021**, *33*, 1006–1021. [CrossRef]

27. Zhang, X.-B.; Duc, T.P.; Mutuc, E.B.; Tsai, F.-S. Intellectual Capital and Financial Performance: Comparison With Financial and Pharmaceutical Industries in Vietnam. *Front. Psychol.* **2021**, *12*, 595615. [CrossRef] [PubMed]

28. Siew-Peng, L.; Mohammed, S. Intellectual capital on listed agricultural firms' performance in Malaysia. *Int. J. Learn. Intellect. Cap.* **2014**, *11*, 202–221. [CrossRef]

29. Kozera, M. The Impact of Intellectual Capital Efficiency on the Profitability of Agricultural Enterprises. In *The Essence and Measurement of Organizational Efficiency*; Dudycz, T., Osbert-Pociecha, G., Brycz, B., Eds.; Springer: Cham, Switzerland, 2016; pp. 123–136.

30. Scafarto, V.; Ricci, F.; Scafarto, F. Intellectual capital and firm performance in the global agribusiness industry: The moderating role of human capital. *J. Intellect. Cap.* **2016**, *17*, 530–552. [CrossRef]

31. Kozera-Kowalska, M.; Baum, R. Measurement of Intellectual Capital in Agricultural Enterprises: A Case Study in Poland. 2018. Available online: https://iises.net/proceedings/10th-economics-finance-conference-rome/table-of-content?cid=69&iid=015&rid=10142 (accessed on 13 January 2024).

32. Xu, J.; Wang, B. Intellectual capital and financial performance of Chinese agricultural listed companies. *Custos Agronegocio Line* **2019**, *15*, 273–290.

33. Kozera-Kowalska, M. Intellectual Capital: ISVA, the Alternative Way of Calculating Creating Value in Agricultural Entities—Case of Poland. *Sustainability* **2020**, *12*, 2645. [CrossRef]

34. Xu, X.L.; Chen, H.H.; Zhang, R.R. The Impact of Intellectual Capital Efficiency on Corporate Sustainable Growth-Evidence from Smart Agriculture in China. *Agriculture* **2020**, *10*, 199. [CrossRef]

35. Xu, X.L.; Li, J.; Wu, D.; Zhang, X. The intellectual capital efficiency and corporate sustainable growth nexus: Comparison from agriculture, tourism and renewable energy sector. *Environ. Dev. Sustain.* **2021**, *23*, 16038–16056. [CrossRef]

36. Ivanovic, T.; Maksimovic, G.; Mandaric, M.; Radivojevic, N.; Jovic, M. The impact of intellectual capital on the financial performance of agricultural enterprises: Evidence from the West Balkans Counties. *Custos Agronegocio Line* **2021**, *17*, 350–376.

37. Ovechkin, D.V.; Romashkina, G.F.; Davydenko, V.A. The Impact of Intellectual Capital on the Profitability of Russian Agricultural Firms. *Agronomy* **2021**, *11*, 286. [CrossRef]

38. Xu, J.; Zhang, Y. Does Intellectual Capital Measurement Matter in Financial Performance? An Investigation of Chinese Agricultural Listed Companies. *Agronomy* **2021**, *11*, 1872. [CrossRef]

39. Jin, G.; Xu, J. Does Intellectual Capital Affect Financial Leverage of Chinese Agricultural Companies? Exploring the Role of Firm Profitability. *Sustainability* **2022**, *14*, 2682. [CrossRef]

40. Balaji, V.; Mamilla, R. Intellectual Capital Efficiency and Its Impact on Sustainable Development of Agri-Business Sector in India. *ECS Trans.* **2022**, *107*, 18059–18070. [CrossRef]

41. Balaji, V.; Mamilla, R. Intellectual capital efficiency and its impact on sustainable growth of Indian agribusiness sector. *Int. J. Learn. Intellect. Cap.* **2023**, *20*, 193–216. [CrossRef]

42. Liu, L.; Xu, J. How does working capital management affect firm profitability in China's agricultural sector? *Custos Agronegocio Line* **2021**, *17*, 72–91.

43. Zhang, L.; Jin, Z.; Xu, J. The impact of intellectual capital on financial performance and sustainable development of agricultural listed companies. *J. Qingdao Agric. Univ. (Soc. Sci.)* **2021**, *33*, 40–45. (In Chinese) [CrossRef]

44. Xu, J.; Wang, J.-J. Research on value creation of intellectual capital of agricultural listed companies-A case study of Shandong Denghai Seeds Co., Ltd. *J. Anhui Agric. Sci.* **2020**, *48*, 250–252. (In Chinese) [CrossRef]

45. Jiang, L. Empirical Study on the Relationship Between Board Characteristics and Corporate Performance of Agricultural Listed Companies in China. Master's Dissertation, Wuhan Polytechnic University, Wuhan, China, 2016.

46. Thompson, R.M.; Alleyne, P. Role of a board of directors and corporate governance in a state-owned enterprise. *Corp. Gov.-Int. J. Bus. Soc.* **2023**, *23*, 478–492. [CrossRef]
47. Arora, A. Gender diversity in boardroom and its impact on firm performance. *J. Manag. Gov.* **2022**, *26*, 735–755. [CrossRef]
48. Ntim, C.G. Board diversity and organizational valuation: Unravelling the effects of ethnicity and gender. *J. Manag. Gov.* **2015**, *19*, 167–195. [CrossRef]
49. Rajkovic, T. Lead independent directors and investment efficiency. *J. Corp. Financ.* **2020**, *64*, 101690. [CrossRef]
50. Abtahi, Z.; Chkir, I.; Benkraiem, R. Board diversity and corporate innovation: New evidence from the Canadian context. *Financ. Res. Lett.* **2023**, *55*, 103826. [CrossRef]
51. Alves, S. Gender diversity on corporate boards and earnings management: Evidence for European Union listed firms. *Cogent Bus. Manag.* **2023**, *10*, 2193138. [CrossRef]
52. Seetharaman, A.; Bin Zaini Sooria, H.H.; Saravanan, A.S. Intellectual capital accounting and reporting in the knowledge economy. *J. Intellect. Cap.* **2002**, *3*, 128–148. [CrossRef]
53. Edvinsson, L. Developing intellectual capital at Skandia. *Long Range Plan.* **1997**, *30*, 366–373. [CrossRef]
54. Hall, R. The strategic analysis of intangible resources. *Strateg. Manag. J.* **1992**, *13*, 135–144. [CrossRef]
55. Li, X.; Nosheen, S.; Ul Haq, N.; Gao, X. Value creation creation during fourth industrial revolution: Use of intellectual capital by most innovative companies of the world. *Technol. Forecast. Soc. Chang.* **2021**, *163*, 120479. [CrossRef]
56. Zheng, C.; Islam, M.N.; Hasan, N.; Halim, M.A. Does intellectual capital efficiency matter for banks' performance and risk-taking behavior? *Cogent Econ. Financ.* **2022**, *10*, 2127484. [CrossRef]
57. Farooq, M.; Ahmad, N. Nexus between board characteristics, firm performance and intellectual capital: An emerging market evidence. *Corp. Gov.-Int. J. Bus. Soc.* **2023**, *23*, 1269–1297. [CrossRef]
58. Javaid, H.M.; Ain, Q.U.; D'Ecclesia, R. Female directors in the boardroom and intellectual capital performance: Does the "critical mass" matter? *Financ. Innov.* **2023**, *9*, 74. [CrossRef]
59. Rana, M.S.; Hossain, S.Z. Intellectual Capital, Firm Performance, and Sustainable Growth: A Study on DSE-Listed Nonfinancial Companies in Bangladesh. *Sustainability* **2023**, *15*, 7206. [CrossRef]
60. Hsu, Y.-H.; Fang, W. Intellectual capital and new product development performance: The mediating role of organizational learning capability. *Technol. Forecast. Soc. Chang.* **2009**, *76*, 664–677. [CrossRef]
61. Roos, G.; Roos, J.; Dragonetti, N.C.; Edvinsson, L. *Intellectual Capital: Navigating in the New Business Landscape*; New York University Press: New York, NY, USA, 1997.
62. Wang, W.-Y.; Chang, C. Intellectual capitaland performancein causal models: Evidence from the information technology industry in Taiwan. *J. Intellect. Cap.* **2005**, *6*, 222–236. [CrossRef]
63. Mondal, A.; Ghosh, K.S. Intellectual capital and financial performance of Indian banks. *J. Intellect. Cap.* **2012**, *13*, 515–530. [CrossRef]
64. Bontis, N.; Keow, W.C.C.; Richardson, S. Intellectual capital and business performance in Malaysian industries. *J. Intellect. Cap.* **2000**, *1*, 85–100. [CrossRef]
65. Li, J.; Yu, D. The Path to Innovation: The Antecedent Perspective of Intellectual Capital and Organizational Character. *Front. Psychol.* **2018**, *9*, 2445. [CrossRef] [PubMed]
66. Chen, H.Z.; Rahman, M.J. Intellectual capital and financial performance: Evidence from Chinese retail firms. *Int. J. Learn. Intellect. Cap.* **2023**, *20*, 394–409. [CrossRef]
67. Pulic, A. VAIC^{TM}-an accounting tool for IC management. *Int. J. Technol. Manag.* **2000**, *20*, 702–714. [CrossRef]
68. Suharman, H.; Hapsari, D.W.; Hidayah, N.; Saraswati, R.S. Value chain in the relationship of intellectual capital and firm's performance. *Cogent Bus. Manag.* **2023**, *10*, 2199482. [CrossRef]
69. Muftiasa, A.; Wibowo, L.A.; Rahayu, A. Is intellectual capital related to telecommunications industry financial performance during COVID-19? *Int. J. Learn. Intellect. Cap.* **2023**, *20*, 29–46. [CrossRef]
70. Nguyen, N.T. The Impact of Intellectual Capital on Service Firm Financial Performance in Emerging Countries: The Case of Vietnam. *Sustainability* **2023**, *15*, 7332. [CrossRef]
71. Tong, Y.H.; Saladrigues, R. The Influence of Intellectual Capital on the Financial Performance of Spanish New Firms. *Montenegrin J. Econ.* **2023**, *19*, 179–188. [CrossRef]
72. Naushad, M.; Faisal, S. Intellectual capital efficiencies and performance of SMEs in KSA. *Int. J. Appl. Manag. Sci.* **2023**, *15*, 151–165. [CrossRef]
73. Kim, S.Y.; Tran, D.B. Intellectual capital and performance: Evidence from SMEs in Vietnam. *Asia-Pac. J. Bus. Adm.* **2024**, *16*, 860–875. [CrossRef]
74. Jackson, S.; Joshi, A.; Erhardt, N.L. Recent research on team and organizational diversity: SWOT analysis and implications. *J. Manag.* **2003**, *29*, 801–830.
75. García-López, M.-J.; Pacheco-Olivares, M.R.; Hamoudi, H. Board Gender Diversity and Firm Performance: An Analysis of the Causal Relationship in Spanish Listed Companies. *Adm. Sci.* **2024**, *14*, 12. [CrossRef]
76. Hamzah, A.H.; Zulkafli, A.H. Board Diversity and Corporate Expropriation. *Procedia-Soc. Behav. Sci.* **2014**, *164*, 562–568. [CrossRef]
77. Zheng, X.; Wang, X. Board gender diversity and corporate litigation: Evidence from China. *Gend. Manag.* **2024**, *39*, 427–446. [CrossRef]

78. Mihail, B.A.; Dumitrescu, D.; Micu, C.D.; Lobda, A. The Impact of Board Diversity, CEO Characteristics, and Board Committees on Financial Performance in the Case of Romanian Companies. *J. Risk Financ. Manag.* **2021**, *15*, 7. [CrossRef]

79. Huang, P.; Lu, Y.; Wu, J. Does board diversity in industry-experience boost firm value? The role of corporate innovation. *Econ. Model.* **2023**, *128*, 106504. [CrossRef]

80. Heyden, M.L.M.; Oehmichen, J.; Nichting, S.; Volberda, H.W. Board Background Heterogeneity and Exploration-Exploitation: The Role of the Institutionally Adopted Board Model. *Glob. Strategy J.* **2015**, *5*, 154–176. [CrossRef]

81. Hong, E. Cracking the Diversity Code: Analyzing Board Gender Diversity in the AEC Sector. *J. Manag. Eng.* **2024**, *40*, 04024006. [CrossRef]

82. Erhardt, N.L.; Werbel, J.D.; Shrader, C.B. Board of director diversity and firm financial performance. *Corp. Gov.-Int. Rev.* **2003**, *11*, 102–111. [CrossRef]

83. Dahlin, K.B.; Weingart, L.R.; Hinds, P.J. Team diversity and information use. *Acad. Manag. J.* **2005**, *48*, 1107–1123. [CrossRef]

84. Volberda, H.W.; Karali, E. Reframing the Compositional Capability: A Resource-Based View on 'A Composition-Based View of Firm Growth'. *Manag. Organ. Rev.* **2015**, *11*, 419–426. [CrossRef]

85. Webber, S.S.; Donahue, L.M. Impact of highly and less job-related diversity on work group cohesion and performance: A meta-analysis. *J. Manag.* **2001**, *27*, 141–162. [CrossRef]

86. Kang, Y.; Zhu, D.H.; Zhang, Y.A. Being extraordinary: How CEOS' uncommon names explain strategic distinctiveness. *Strateg. Manag. J.* **2021**, *42*, 462–488. [CrossRef]

87. Westphal, J.D.; Zajac, E.J. Who shall govern? CEO/board power, demographic similarity, and new director selection. *Adm. Sci. Q.* **1995**, *40*, 60–83. [CrossRef]

88. Bernile, G.; Bhagwat, V.; Yonker, S. Board diversity, firm risk, and corporate policies. *J. Financ. Econ.* **2018**, *127*, 588–612. [CrossRef]

89. Deze, J.; Sudaric, T.; Ranogajec, L. Agri-entrepreneurship: Measurement and evaluation of intellectual capital potential. *Cent. Eur. Bus. Rev.* **2023**, *12*, 71–92. [CrossRef]

90. Lee, H.-Y.; Liu, C.-F.; Yain, Y.-S.; Lin, C.-H. Intellectual capital for green accounting in agribusiness. *Int. Food Agribus. Manag. Rev.* **2020**, *23*, 759–765. [CrossRef]

91. Paoloni, P.; Modaffari, G.; Paoloni, N.; Ricci, F. The strategic role of intellectual capital components in agri-food firms. *Br. Food J.* **2022**, *124*, 1430–1452. [CrossRef]

92. Modaffari, G.; Paoloni, N.; Manzo, M. Intellectual capital's contribution to innovative female agri-start-ups: A multiple case study. *J. Intellect. Cap.* **2023**, *24*, 1506–1531. [CrossRef]