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ENHANCING HUMAN, STRUCTURAL, AND RELATIONAL CAPITAL ON STARTUP PERFORMANCE OF NIGERIAN AGRIC-ENTREPRENEURS: THE MEDIATING ROLE OF ENTREPRENEURIAL SELF-EFFICACY

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ABSTRACT

The agricultural sector is a critical driver of economic growth and food security in Nigeria, yet many agribusiness startups struggle with performance challenges. This study examines the role of human, structural, and relational capital in enhancing the performance of Nigerian agripreneurs, with a specific focus on the mediating role of entrepreneurial self-efficacy (ESE). This study adopts a quantitative research design using a survey method to collect data from Nigerian agric-entrepreneurs. The study population consists of 1,234 registered agribusiness startup owners across different agricultural value chains in Soba Local Government of Kaduna State, including crop production, livestock farming, agro-processing, and agritech ventures. Using a quantitative research approach, data was collected from agribusiness entrepreneurs and analyzed using Structural Equation Modeling (SEM) to test the relationships among the study variables. The results indicate that structural capital has the most significant positive impact on startup performance, emphasizing the importance of well-developed business frameworks, technology adoption, and efficient operational systems. Conversely, relational capital negatively affects startup performance, suggesting that over-dependence on external networks may impede decision-making and business success. Human capital did not significantly predict starup performance. However, when mediated by ESE, both human and relational capital positively influence startup performance, highlighting the importance of confidence and entrepreneurial capability in resource utilization. The study contributes to the Resource-Based View (RBV) and Social Cognitive Theory (SCT) by integrating psychological factors into the entrepreneurial framework. Practical implications suggest that agripreneurs should prioritize structural development, entrepreneurial training, and strategic relationship management to enhance business success. Policymakers should implement capacity-building initiatives, financial incentives, and infrastructural support to foster a more resilient agribusiness sector.

Keywords: *Enhancing Human, Structural, Relational Capital, Startup Performance Agric-Entrepreneurs*
JEL Classification Code: *JL 360; JL630*

1.0 Introduction

In the modern economic landscape, entrepreneurship serves as a catalyst for innovation, job creation, and inclusive growth, particularly within developing nations such as Nigeria. The agricultural sector in Nigeria, endowed with vast natural resources, presents immense potential for entrepreneurial activity and value addition across various segments of the agricultural value chain (Abolade, 2022). Despite this potential, agric-entrepreneurs in the country face a myriad of challenges that continue to impede the performance of their startups. These obstacles include inadequate access to finance, insufficient infrastructure, limited

entrepreneurial capacity, and weak support networks (Adelekan & Musa, 2020; Amusa et al., 2019). As a result, the growth and sustainability of many agricultural enterprises are stifled, undermining the sector's contribution to national economic development.

Although prior research has explored the role of various capital resources in entrepreneurial performance, a significant gap remains in understanding how specific forms of intellectual capital—namely human, structural, and relational capital—impact the performance of agricultural startups in Nigeria. Existing studies have predominantly focused on SMEs in general, overlooking the unique contextual realities of agriculture-based ventures in emerging economies. Furthermore, most of the literature examines these forms of capital in isolation, without accounting for their combined influence on startup performance. While studies such as those by Bakwuye et al. (2024) and Ogbeibu and Olaleye (2019) provide valuable insights into the challenges and survival strategies of agribusinesses in Nigeria, there is a lack of integrated frameworks that examine how human, structural, and relational capital interact to drive success in the agricultural sector.

Moreover, a notable research gap lies in the limited exploration of entrepreneurial self-efficacy (ESE) as a mediating factor in the relationship between intellectual capital and startup performance. Entrepreneurial self-efficacy refers to an individual's belief in their ability to execute entrepreneurial tasks successfully and navigate the challenges associated with business operations (El Shoubaki et al., 2020). While several studies have addressed mediators such as innovation capability (Purwati et al., 2021) and knowledge sharing behavior (Salamzadeh et al., 2023), little is known about how ESE may influence the impact of human, structural, and relational capital on performance outcomes in agric-entrepreneurship. This gap is particularly significant given the complex and uncertain nature of Nigeria's agricultural sector, which demands a high degree of adaptability and confidence from entrepreneurs.

Research has established the importance of intellectual capital in driving entrepreneurial outcomes, with scholars highlighting the individual roles of human capital (Aljazeeri & Hamdan, 2023), structural capital (Beltramino et al., 2020), and relational capital (Villanueva-Flores et al., 2023). However, these studies often fail to capture the synergistic effects of these capitals, especially within the agricultural sector of developing economies. Additionally, literature on entrepreneurial self-efficacy suggests that individuals with high ESE are more likely to take initiative, persist through setbacks, and successfully navigate entrepreneurial tasks (Hueso et al., 2021; Tan et al., 2023). Despite this, the potential mediating role of ESE in enhancing the effect of intellectual capital on startup performance among agric-entrepreneurs in Nigeria remains understudied.

Within the Nigerian agricultural context, the challenges of climate variability, infrastructure deficits, limited financing, and inefficiencies in the value chain further compound the difficulties faced by agric-entrepreneurs (Atuluku et al., 2023; Okoli et al., 2022). These sector-specific challenges necessitate a nuanced understanding of the resources and psychological traits that enable entrepreneurs to thrive. As such, exploring how human capital (knowledge, skills, expertise), structural capital (systems, processes, organizational resources), and relational capital (networks, partnerships, social ties) contribute to startup performance can yield practical insights. When considered alongside entrepreneurial self-efficacy, these forms of capital may provide agric-entrepreneurs with the necessary tools to overcome sectoral barriers and drive sustainable business growth.

This study, therefore, seeks to investigate the direct effects of human, structural, and relational capital on startup performance, as well as the mediating role of entrepreneurial self-efficacy in these relationships. The research aims to integrate intellectual capital theory with self-efficacy theory to provide a comprehensive model for understanding startup performance in

Nigerian agribusiness. Entrepreneurs with high human capital—such as agricultural knowledge and technical expertise—are more likely to identify and exploit opportunities within the sector (Salamzadeh et al., 2023). Structural capital, including access to information, technology, and formal systems, equips them with the organizational tools needed to operate efficiently (Balogun, Adeyonu, & Ayantoye, 2021). Relational capital, encompassing social ties, external partnerships, and trust-based networks, helps entrepreneurs gain access to critical resources and markets (Aboobaker & Ka, 2023).

Entrepreneurial self-efficacy serves as a cognitive mechanism that enhances an entrepreneur's ability to apply these capital resources effectively. Individuals with high self-efficacy are more resilient, persistent, and proactive in the face of business challenges (Caliendo, Kritikos, Rodriguez, & Stier, 2023). These attributes are essential in the agricultural sector, where unpredictability and market volatility are prevalent. Thus, ESE not only reinforces the influence of intellectual capital but also strengthens entrepreneurs' confidence to translate these resources into tangible performance outcomes (Ikuemonisan, 2024).

Understanding the mediating role of entrepreneurial self-efficacy offers practical implications for policymakers, educators, and entrepreneurship development practitioners. By designing targeted interventions—such as training, mentoring, and experiential learning programs—stakeholders can enhance the confidence and capability of agric-entrepreneurs to leverage their intellectual capital more effectively (Abolade, 2022). This will not only improve startup performance but also contribute to the broader goals of food security, employment generation, and economic diversification in Nigeria.

Against this backdrop, the present study contributes to the ongoing discourse on entrepreneurial development by providing an integrated model that examines the role of intellectual capital and entrepreneurial self-efficacy in shaping startup performance in Nigerian agriculture. By focusing on agric-entrepreneurs, the study addresses a critical yet underexplored segment of entrepreneurship and offers evidence-based recommendations for boosting agribusiness success in emerging economies. Hence, the study hypothesized that:

H1: There is no positive relationship between human capital (HC) and startup performance (SP) among Nigerian agric-entrepreneurs.

H2: There is no positive relationship between structural capital (SC) and startup performance (SP) among Nigerian agric-entrepreneurs.

H3: There is no positive relationship between relational capital (RC) and startup performance (SP) among Nigerian agric-entrepreneurs.

H4: Entrepreneurial self-efficacy (ESE) does not mediate the relationship between human capital (HC) and startup performance (SP) among Nigerian agric-entrepreneurs.

H5: Entrepreneurial self-efficacy (ESE) does not mediate the relationship between structural capital (SC) and startup performance (SP) among Nigerian agric-entrepreneurs.

H6: Entrepreneurial self-efficacy (ESE) does not mediate the relationship between relational capital (RC) and startup performance (SP) among Nigerian agric-entrepreneurs.

2.0 Literature Review

The literature review explores the theoretical and empirical foundations of intellectual capital (human, structural, and relational capital) and its impact on startup performance, particularly in the Nigerian agricultural sector. Existing research highlights the significance of resource-

based advantages in driving entrepreneurial success, yet there remains limited evidence on how these forms of capital interact and influence agribusiness startups. Furthermore, the mediating role of entrepreneurial self-efficacy (ESE) is underexplored, necessitating a deeper investigation into how psychological confidence and resource utilization contribute to business performance in dynamic and uncertain agricultural markets.

Startup Performance

Startup performance refers to the effectiveness and success of newly established ventures in achieving their business objectives and goals normally not less than five years in existence (Ritala et al., 2021). In the context of Nigerian agric-entrepreneurs, startup performance encompasses various indicators such as profitability, growth rate, market share, and sustainability. Recent literature has highlighted the factors influencing startup performance, including human capital, structural capital, and relational capital, as discussed earlier. For instance, Aljazeeri and Hamdan (2023) examined the impact of human capital and competencies on startup success, emphasizing the importance of knowledge, skills, and capabilities in driving business performance. Similarly, Emeka et al. (2023) investigated the relationship between intellectual capital efficiency and corporate sustainability growth in Nigeria, indicating the significant role of intellectual capital in enhancing firm performance. By understanding the determinants of startup performance, agric-entrepreneurs can develop strategies to optimize their resources and improve their competitiveness in the market.

Entrepreneurial Self-Efficacy

Entrepreneurial self-efficacy refers to an individual's belief in their ability to successfully perform entrepreneurial tasks and overcome challenges encountered in the entrepreneurial process (Salamzadeh et al., 2023). In the context of Nigerian agric-entrepreneurs, entrepreneurial self-efficacy plays a critical role in influencing startup performance. Recent research has demonstrated that individuals with higher levels of entrepreneurial self-efficacy are more likely to initiate entrepreneurial activities, persist in the face of obstacles, and achieve entrepreneurial success (Iskandar & Kaltum, 2021). For example, Purwati et al. (2021) investigated the effect of innovation capability on business performance, highlighting the mediating role of entrepreneurial self-efficacy. Additionally, Salamzadeh et al. (2023) examined the relationship between human capital and the performance of Iranian digital startups, emphasizing the moderating role of knowledge sharing behavior and entrepreneurial self-efficacy. Therefore, fostering entrepreneurial self-efficacy among agric-entrepreneurs through training, mentorship, and support programs, policymakers and stakeholders can enhance startup performance and contribute to the sustainable growth of the agricultural sector in Nigeria.

Human Capital

Human capital refers to the knowledge, skills, and abilities possessed by individuals, which can be leveraged to enhance organizational performance and competitiveness (Arokiasamy et al., 2023). In the context of Nigerian agric-entrepreneurs, the importance of human capital cannot be overstated. Studies have shown that the expertise, experience, and entrepreneurial mindset of individuals involved in agricultural ventures significantly influence startup performance (Amusa et al., 2019). For example, Adelekan and Musa (2020) highlighted that addressing entrepreneurial challenges, such as access to education and training programs, can improve the human capital of agric-entrepreneurs and contribute to agricultural development in Nigeria. Furthermore, recent research by El Shoubaki et al. (2020) demonstrated that the growth of small and medium enterprises (SMEs) in the agricultural sector is mediated by human capital factors, such as the reasons motivating individuals to start businesses.

Structural Capital

Structural capital refers to the organizational infrastructure, processes, and systems that facilitate the effective utilization and management of knowledge within a firm (Beltramino et al., 2020). In the context of agric-entrepreneurs, structural capital plays a crucial role in shaping startup performance. Recent literature has emphasized the importance of organizational capabilities, such as information systems, knowledge management practices, and intellectual property rights, in enhancing the efficiency and innovation of agricultural ventures (Bakwuye et al., 2024). For instance, Demartini and Beretta (2020) conducted a structured literature review and found that investments in structural capital positively influence the performance of small and medium-sized enterprises (SMEs), including those in the agricultural sector. Moreover, Dal Mas and Paoloni (2020) highlighted the role of relational capital in promoting social sustainability among female entrepreneurs in Italy, underscoring the interconnectedness of structural and relational capital in driving business excellence.

Relational Capital

Relational capital encompasses the relationships, networks, and social connections that firms develop with various stakeholders, including customers, suppliers, and partners (Chatterji & Kiran, 2023). In the context of Nigerian agric-entrepreneurs, relational capital is vital for accessing resources, market opportunities, and support networks that can drive startup performance. Recent studies have emphasized the role of social capital in shaping the success of agricultural ventures. For example, Ogbeibu and Olaleye (2019) explored the entrepreneurial challenges and survival strategies of small-scale agribusinesses in Nigeria, highlighting the significance of social networks in navigating market uncertainties and accessing critical resources. Additionally, Purwati et al. (2021) investigated the effect of innovation capability on the performance of SMEs in Indonesia, emphasizing the mediating role of social capital and entrepreneurial leadership. These findings underscore the importance of relational capital in enhancing the competitiveness and resilience of agric-entrepreneurs in Nigeria's dynamic business environment.

2.1 Empirical Review

The literature reviewed encompasses various aspects of entrepreneurship, particularly within the context of small and medium enterprises (SMEs) and startups. Adelekan and Musa (2020) highlight the entrepreneurial challenges facing the agricultural sector in Nigeria, emphasizing the need to address these obstacles for sustainable development. Aljazeeri and Hamdan (2023) focus on the impact of human capital and competencies on startup success, shedding light on the importance of skills and capabilities for entrepreneurial ventures. The study found that human can significantly predict startup performance. Similarly, Amusa et al. (2019) delve into the significance of agricultural entrepreneurship for economic development in Nigeria, underscoring the potential of entrepreneurial activities to drive growth and prosperity.

Arokiasamy et al. (2023) provide a systematic review of literature on human capital investment, emphasizing its significance for human resource development and organizational performance. Bakwuye et al. (2024) explore the role of entrepreneurship in sustaining organizational performance among SMEs, emphasizing the importance of entrepreneurial initiatives for business success. The study reported that technical and entrepreneurial skill significant influence entrepreneurial success. Beltramino et al. (2020) delve into the relationship between structural capital, innovation, and performance in SMEs, highlighting the role of intangible assets in driving organizational outcomes.

Chatterji & Kiran (2023) investigate the influence of human, organizational, and relational capital of universities on their performance, providing insights into the dynamics of

knowledge creation and dissemination. Other studies, such as those by Dal Mas and Paoloni (2020), Demartini and Beretta (2020), and El Shoubaki et al. (2020), further contribute to the understanding of intellectual capital, human capital, and SME growth, emphasizing the multifaceted nature of these concepts and their implications for entrepreneurial activities. Emeka et al. (2023) provide evidence on the relationship between intellectual capital efficiency and corporate sustainability growth, highlighting the role of intangible assets in driving long-term business success.

Studies such as those by Adelekan and Musa (2020) and Ogbeibu and Olaleye (2019) shed light on the specific challenges and survival strategies faced by agribusinesses in Nigeria, highlighting the importance of addressing these factors to foster sustainable growth and development in the agricultural sector. Additionally, research by Amusa et al. (2019) underscores the significant impact of agricultural entrepreneurship on economic development in Nigeria, emphasizing the potential of entrepreneurship to drive positive socio-economic outcomes in the country.

Furthermore, the literature provides insights into the role of different forms of capital, such as human, structural, and relational capital, in influencing startup performance. Studies by Aljazeeri and Hamdan (2023), Bakwuye et al. (2024), and Salamzadeh et al. (2023) explore the impact of human capital and competencies, structural capital, and knowledge sharing behavior on business success and performance, respectively. They reported a significant influence of human capital on business performance. Additionally, research by Beltramino et al. (2020) and Chatterji & Kiran (2023) delves into the influence of structural and relational capital on organizational performance, highlighting the importance of these intangible assets for driving innovation and competitiveness in SMEs and universities, respectively.

The synthesized literature accentuates the interconnectedness of various factors shaping entrepreneurial outcomes, from the challenges faced by agribusinesses to the role of different forms of capital in driving startup performance. Thus, integrating insights from these studies, policymakers and practitioners can gain a more holistic understanding of the factors driving entrepreneurship and develop targeted interventions to support the growth and development of startups in Nigeria's agricultural sector.

2.2 Theoretical Framework

For the study on enhancing human, structural, and relational capital on startup performance of Nigerian agric-entrepreneurs, two relevant theories that can be employed are the Resource-Based View (RBV) by Barney (1991) and Social Capital Theory, developed by Bourdieu (1986) and later expanded by Putnam (1995) and Nahapiet & Ghoshal (1998).

Resource-Based View (RBV). The RBV posits that a firm's competitive advantage and performance are determined by its unique bundle of resources and capabilities (Barney, 1991). In the context of agric-entrepreneurs, human, structural, and relational capital can be considered as critical resources that contribute to startup performance (Wernerfelt, 1984). Human capital, comprising the knowledge, skills, and expertise of individuals involved in the entrepreneurial venture, can lead to innovation, efficient decision-making, and effective implementation of strategies, thereby enhancing startup performance (Arokiasamy et al., 2023). Structural capital, which includes organizational processes, systems, and intellectual property, provides the framework for coordinating activities and leveraging knowledge assets within the startup, leading to improved operational efficiency and competitiveness (Beltramino et al., 2020). Relational capital, represented by the quality and extent of relationships and networks with stakeholders such as suppliers, customers, and partners,

facilitates access to resources, information sharing, and collaboration, thereby enhancing market reach, access to financing, and overall startup performance (Chatterji & Kiran, 2023).

Social Capital Theory. Social Capital Theory emphasizes the importance of social relationships, networks, and norms in generating economic outcomes (Putnam, 1993). In the context of agric-entrepreneurs, social capital plays a crucial role in influencing startup performance through various mechanisms. Social networks provide access to valuable resources, information, and opportunities, enabling entrepreneurs to acquire necessary inputs, market their products, and access financing (Ogbeibu & Olaleye, 2019). Additionally, social capital fosters trust, cooperation, and reciprocity among actors within the entrepreneurial ecosystem, leading to increased collaboration, knowledge sharing, and collective action, which can positively impact startup performance (Salamzadeh et al., 2023). Therefore, leveraging entrepreneurial capital, agric-entrepreneurs can tap into the expertise, support, and networks of diverse stakeholders, thereby enhancing their ability to overcome challenges, exploit opportunities, and achieve sustainable growth and success in their ventures.

2.3 Conceptual Framework for the Study

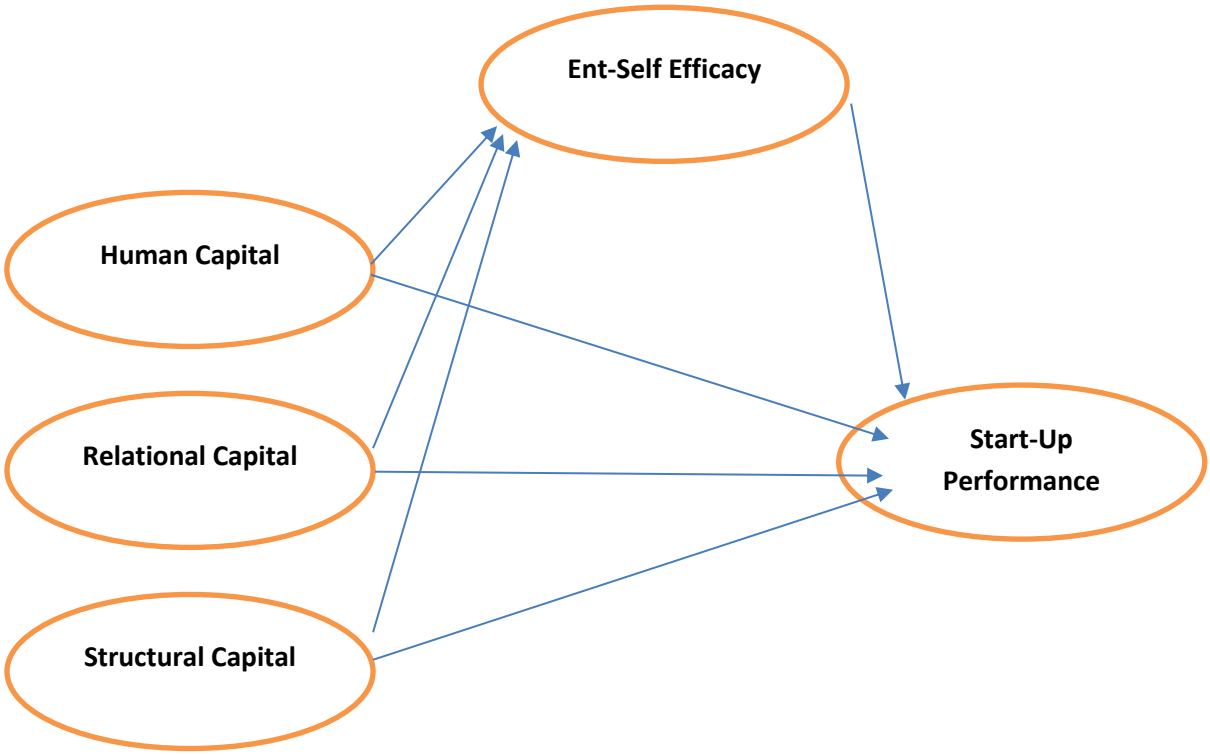

Figure 1 Research Framework

The conceptual framework for this study integrates the Resource-Based View (RBV) theory and Social Cognitive Theory (SCT) to examine the relationship between intellectual capital (human, structural, and relational capital) and startup performance among Nigerian agric-entrepreneurs, with entrepreneurial self-efficacy (ESE) as a mediating variable. Human capital refers to the knowledge, skills, and abilities that enable entrepreneurs to innovate and manage agribusinesses effectively. Structural capital encompasses the organizational processes, technological infrastructure, and operational systems that support business scalability and

efficiency. Relational capital represents the networks, partnerships, and external relationships that facilitate market access and resource mobilization. While these forms of intellectual capital are critical for business success, their effectiveness depends on entrepreneurs' self-efficacy, which influences their ability to leverage these resources for growth, competitiveness, and resilience in a challenging agricultural environment. This framework posits that ESE mediates the relationship between intellectual capital and startup performance, meaning that agric-entrepreneurs with higher confidence in their entrepreneurial abilities are more likely to effectively utilize their intellectual resources to achieve superior business outcomes. This study provides an integrated perspective on the determinants of startup success in the Nigerian agricultural sector, offering insights for policymakers, educators, and business development programs.

2.4 Theoretical Framework

This study makes significant theoretical contributions by integrating the Resource-Based View (RBV) and Social Cognitive Theory (SCT) to explain the interplay between intellectual capital, entrepreneurial self-efficacy, and startup performance in Nigerian agribusinesses. While RBV emphasizes the importance of internal resources such as human, structural, and relational capital in achieving a competitive advantage, SCT extends this perspective by highlighting the psychological mechanisms—specifically entrepreneurial self-efficacy (ESE)—that mediate the resource-performance relationship. By demonstrating that human and relational capital require ESE to positively impact startup performance, this study refines the RBV by incorporating psychological constructs as essential enablers of resource utilization. Furthermore, the negative relationship between relational capital and startup performance challenges existing literature, suggesting that over-reliance on external networks may hinder business outcomes. These insights contribute to entrepreneurial and agribusiness theories by offering a nuanced understanding of how both tangible and intangible factors interact to influence startup success, particularly in developing economies.

3.0 Methodology

This study adopts a quantitative research design using a survey method to collect data from Nigerian agric-entrepreneurs. The study population consists of 1,234 registered agribusiness startup owners across different agricultural value chains in Soba Local Government of Kaduna State, including crop production, livestock farming, agro-processing, and agritech ventures. Soba Local Government Area (LGA) in Kaduna State, Nigeria, is predominantly agrarian and serves as a vital hub for agricultural business in the region. Located in the northern part of Kaduna, Soba LGA is characterized by fertile land, favorable climatic conditions, and a large population engaged in farming activities. The area is known for the cultivation of crops such as maize, millet, sorghum, groundnuts, and soybeans, as well as the rearing of livestock like cattle, goats, and poultry. Agricultural activities in Soba have attracted local traders and small-scale agro-processors who add value through storage, transportation, and marketing of produce. A structured questionnaire was developed to measure the key study variables—human capital, structural capital, relational capital, entrepreneurial self-efficacy, and startup performance—using validated scales from prior literature. The survey was distributed using a random sampling technique to ensure a fair representation of the study population.

To analyze the collected data, this study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 3.8. PLS-SEM is chosen due to its suitability for testing complex relationships involving multiple latent constructs, small-to-medium sample sizes, and non-normal data distributions. The model evaluation follows a two-step approach: (1) measurement model assessment, which examines factor loadings, reliability, and validity

(Cronbach's Alpha, Composite Reliability, and AVE), and (2) structural model assessment, which tests the hypothesized relationships among constructs using path coefficients, R^2 values, effect sizes (f^2), and bootstrapping for significance testing. The findings from PLS-SEM provide insights into the direct and mediating effects of entrepreneurial self-efficacy on the relationship between intellectual capital (human, structural, and relational capital) and startup performance among Nigerian Agric-entrepreneurs.

4.0 Result and Discussion

The Results and Discussion section presents the findings of the study based on the analysis of data collected from Nigerian agric-entrepreneurs. It examines the impact of human, structural, and relational capital on startup performance and evaluates the mediating role of entrepreneurial self-efficacy (ESE) using PLS-SEM analysis. The results are interpreted in relation to existing theories, including the Resource-Based View (RBV) and Social Capital Theory, to understand how intellectual capital influences business success in the agricultural sector. Additionally, key implications are discussed, highlighting practical recommendations for policymakers, entrepreneurs, and support institutions to enhance agribusiness sustainability and growth. Meanwhile, out of the distributed questionnaires, a response rate of 87% was achieved, resulting in 1,074 valid responses for analysis. The demographic distribution of respondents shows that 78% were male and 22% were female, reflecting the gender disparity in agricultural entrepreneurship in Nigeria.

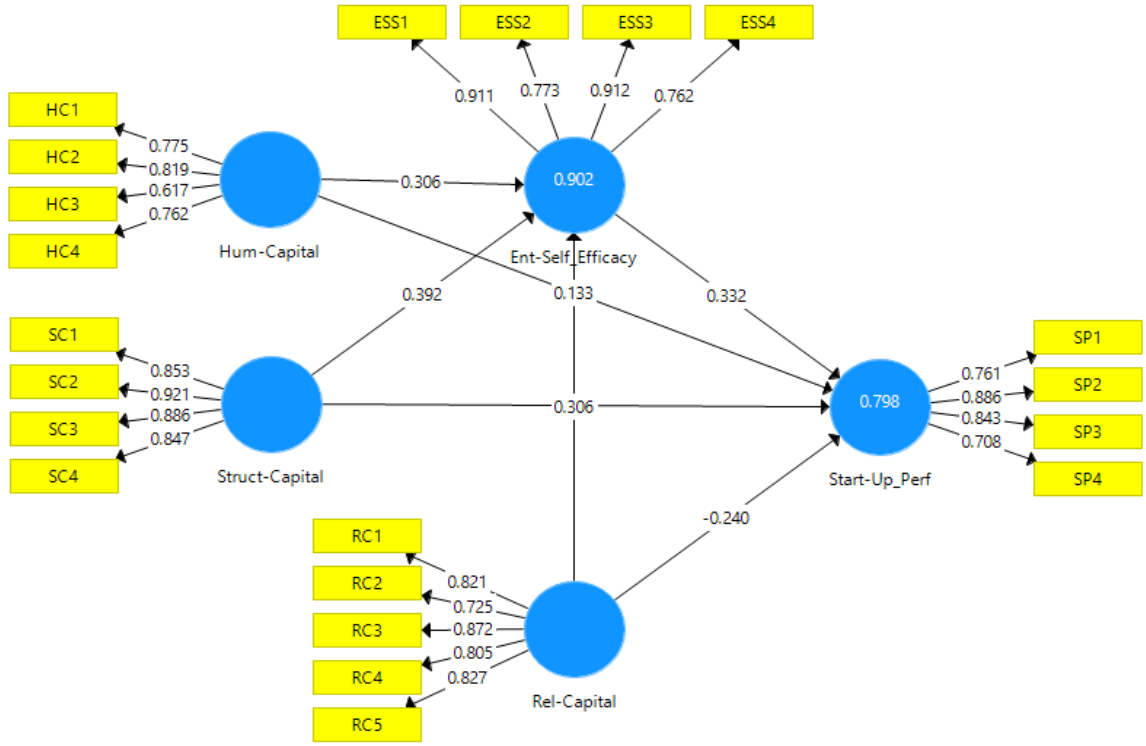

Figure 2 Path Models

Table 1 Loadings and Internal Consistency

Indicators	Loadings	CA	CR	AVE
ESS1	0.911	0.862	0.907	0.71
ESS2	0.773			
ESS3	0.912			

ESS4	0.762			
HC1	0.775	0.732	0.833	0.558
HC2	0.819			
HC3	0.617			
HC4	0.762			
RC1	0.821	0.869	0.906	0.658
RC2	0.725			
RC3	0.872			
RC4	0.805			
RC5	0.827			
SC1	0.853	0.813	0.878	0.644
SC2	0.921			
SC3	0.886			
SC4	0.847			
SP1	0.761	0.900	0.93	0.77
SP2	0.886			
SP3	0.843			
SP4	0.708			

Source: Smart-PLS output (2025)

Table 1 presents the loadings and internal consistency metrics for the constructs measured in the study. The factor loadings for all items exceed the acceptable threshold of 0.60, indicating strong item reliability. The Cronbach's Alpha (CA) values range from 0.732 to 0.900, suggesting satisfactory internal consistency, while the Composite Reliability (CR) values, ranging from 0.833 to 0.93, confirm the constructs' reliability. The Average Variance Extracted (AVE) values, all above 0.50, demonstrate adequate convergent validity. Specifically, Entrepreneurial Self-Efficacy (ESS) has an AVE of 0.71, Human Capital (HC) 0.558, Relational Capital (RC) 0.658, Structural Capital (SC) 0.644, and Startup Performance (SP) 0.77. These results indicate that the constructs used in the study exhibit strong reliability and validity, supporting their suitability for further statistical analysis, such as Structural Equation Modeling (SEM).

Table 2 Fornell and Larcker Criterion

	Ent-Self_Efficacy	Hum-Capital	Rel-Capital	Start-Up_Perf	Struct-Capital
Ent-Self_Efficacy	**0.843**				
Hum-Capital	0.413	**0.747**			
Rel-Capital	0.234	0.318	**0.811**		
Start-Up_Perf	0.832	0.767	0.715	**0.803**	
Struct-Capital	0.569	0.525	0.708	0.483	**0.877**

Smart-PLS output (2025)

Table 2 presents the Fornell and Larcker Criterion, which assesses discriminant validity by comparing the square root of the Average Variance Extracted (AVE) (diagonal values) with the correlation coefficients between constructs (off-diagonal values). The diagonal values, representing the AVE square root, are higher than the corresponding correlation values in

their respective columns and rows, confirming acceptable discriminant validity. Entrepreneurial Self-Efficacy (0.843), Human Capital (0.747), Relational Capital (0.811), Startup Performance (0.803), and Structural Capital (0.877) all demonstrate sufficient differentiation from other constructs. Notably, Startup Performance exhibits strong correlations with Entrepreneurial Self-Efficacy (0.832) and Human Capital (0.767), indicating their substantial influence on startup success. Additionally, Structural Capital shows a high correlation with Relational Capital (0.708), suggesting their interconnected role in entrepreneurial performance. Overall, the results affirm that each construct in the study possesses distinct explanatory power, justifying their inclusion in further analysis.

4.1 Assessment of Structural Model

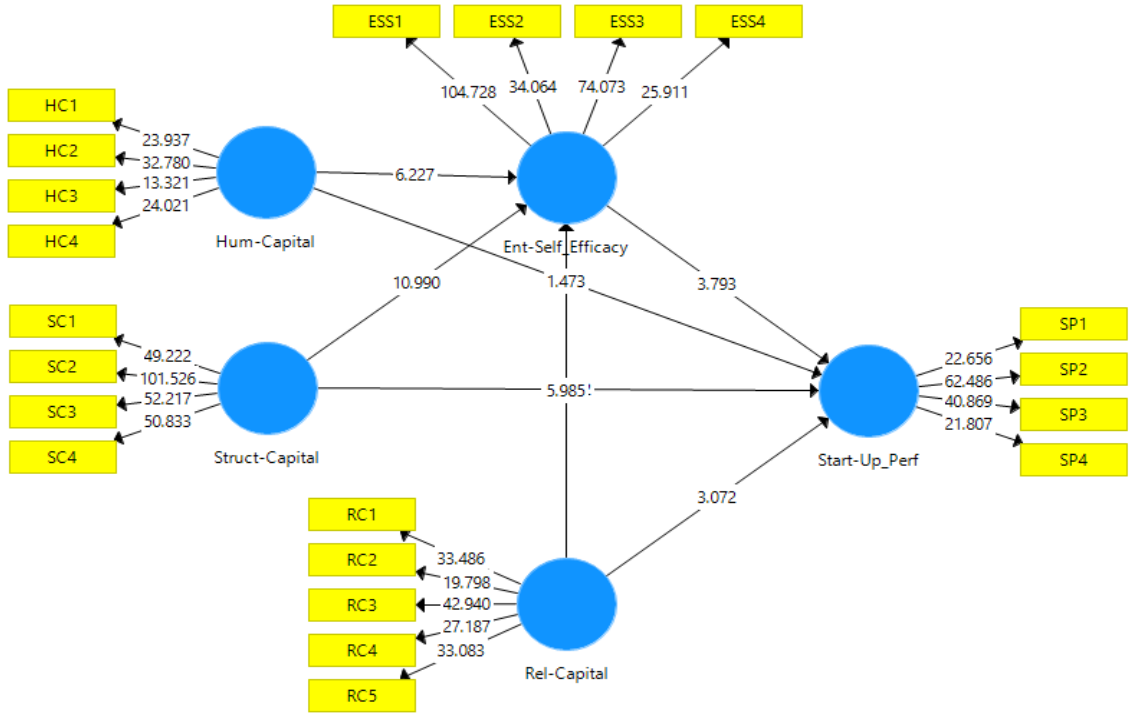

Figure 3 Structural model

Table 3 Test of Hypotheses

Relationships	Beta	Mean	Stand Dev	T Stat	P Values	Decision
Hum-Capital -> Start-Up_Perf	0.133	0.140	0.091	1.473	0.141	Fail to Reject
Rel-Capital -> Start-Up_Perf	-0.240	-0.239	0.078	3.072	0.002	Reject
Struct-Capital -> Start-Up_Perf	0.669	0.671	0.066	10.152	0.000	Reject
Hum-Capital -> Ent-Self_Efficacy -> Start-Up_Perf	0.102	0.099	0.035	2.900	0.004	Reject
Rel-Capital -> Ent-Self_Efficacy -> Start-Up_Perf	0.102	0.098	0.027	3.774	0.000	Reject
Struct-Capital -> Ent-Self_Efficacy -> Start-Up_Perf	0.130	0.128	0.037	3.547	0.000	Reject

Smart-PLS output (2025)

The first hypothesis examines the effect of Human Capital on Startup Performance. The results indicate a beta coefficient of 0.133, a T-statistic of 1.473, and a p-value of 0.141, which

suggests that the relationship is statistically insignificant. As a result, the study fails to reject the null hypothesis, implying that human capital alone does not significantly drive startup performance in Nigerian agribusinesses. This could be due to a lack of applied entrepreneurial skills or an absence of effective knowledge transfer mechanisms in agripreneurial ventures.

The second hypothesis tests the relationship between Relational Capital and Startup Performance, yielding a negative beta coefficient of -0.240, a T-statistic of 3.072, and a p-value of 0.002. This significant negative relationship leads to rejecting the null hypothesis, indicating that relational capital, rather than enhancing startup performance, may impede it in some cases. Possible reasons could be an over-reliance on external networks that do not translate into tangible business outcomes or ineffective business partnerships that stifle decision-making and innovation.

The third hypothesis assesses the influence of Structural Capital on Startup Performance, producing a beta coefficient of 0.669, a T-statistic of 10.152, and a p-value of 0.000. The strong positive relationship leads to the rejection of the null hypothesis, confirming that structural capital significantly enhances startup performance. This suggests that well-developed business processes, operational systems, and technology adoption are critical enablers of agribusiness success in Nigeria.

The fourth hypothesis explores the mediating role of Entrepreneurial Self-Efficacy (ESE) in the relationship between Human Capital and Startup Performance. The results show a beta of 0.102, a T-statistic of 2.900, and a p-value of 0.004, leading to the rejection of the null hypothesis. This finding suggests that while human capital alone does not directly enhance startup performance, the presence of high entrepreneurial self-efficacy enables entrepreneurs to leverage their skills and knowledge effectively, thereby improving business outcomes.

The fifth hypothesis examines the mediating effect of Entrepreneurial Self-Efficacy on the relationship between Relational Capital and Startup Performance. The beta coefficient of 0.102, a T-statistic of 3.774, and a p-value of 0.000 indicate a significant mediation effect, leading to rejection of the null hypothesis. This suggests that while relational capital alone negatively impacts startup performance, when entrepreneurs possess strong self-efficacy, they are better able to leverage networks, collaborations, and market relationships to drive business success.

The final hypothesis investigates the mediating effect of Entrepreneurial Self-Efficacy on the relationship between Structural Capital and Startup Performance. The findings show a beta of 0.130, a T-statistic of 3.547, and a p-value of 0.000, leading to rejection of the null hypothesis. This implies that structural capital enhances startup performance even more when entrepreneurs exhibit strong self-efficacy, as they can effectively utilize business structures, technology, and operational frameworks to maximize efficiency and profitability.

5.0 Conclusion and Recommendations

This study examined the impact of human, structural, and relational capital on the performance of Nigerian agribusiness startups, with a focus on the mediating role of entrepreneurial self-efficacy (ESE). The findings reveal that structural capital has the most significant positive effect on startup performance, emphasizing the need for strong organizational frameworks, technology adoption, and efficient business processes. In contrast, human capital alone does not directly enhance startup performance but becomes impactful when mediated by ESE, suggesting that entrepreneurial confidence and skills development are crucial for translating knowledge and expertise into business success. Furthermore, relational capital was found to have a negative impact on startup performance,

indicating that excessive reliance on external networks may hinder decision-making or lead to unproductive business collaborations. However, when mediated by ESE, relational capital becomes a positive driver of performance, reinforcing the role of self-confidence and problem-solving abilities in leveraging business relationships effectively.

Based on the findings the study recommended that:

1. Agripreneurs should prioritize business process optimization, technology integration, and strategic organizational development to improve operational efficiency and scalability. Government agencies and business support organizations should provide access to financial incentives and infrastructure that promote innovation and sustainable agribusiness practices.
2. Given the crucial mediating role of ESE, training programs should focus on confidence-building, risk management, problem-solving, and strategic decision-making. Universities, business incubators, and government agencies should incorporate entrepreneurship education tailored to the agribusiness sector to enhance self-efficacy among aspiring agripreneurs.
3. While human capital alone does not significantly impact startup performance, its effectiveness increases with ESE. Therefore, agribusiness startups should invest in continuous learning, skill enhancement, and mentorship programs that equip entrepreneurs with both technical and managerial expertise.
4. Since relational capital negatively impacts startup performance, agripreneurs should carefully evaluate partnerships, networks, and collaborations to ensure they contribute positively to business growth. Policymakers and business organizations should facilitate networking events and business linkages that provide value-driven collaborations, ensuring that partnerships are strategic and mutually beneficial rather than mere affiliations.
5. Policymakers should implement structured policies that support agribusiness startups, including low-interest loans, tax incentives, and grants for agripreneurs to invest in technology and infrastructure. Additionally, regulatory frameworks should be designed to facilitate stronger institutional support for agripreneurs, ensuring they have access to market opportunities, advisory services, and financial resources necessary for sustainable growth.

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