



## **Moderating Effect of Firm Characteristic in the Relationship between System-Thinking Competency and Economic Performance of Startups in Lagos**

**\*Imo Okorie Imo; \*\*Prof. F. Epetimehin; & \*Dr S.O. Onimole**

\*Dept. of Entrepreneurship, College of Management Science, Joseph Ayo Babalola University, Ikeji-Arakeji, Osun State, Nigeria. \*\*College of Management Sciences, Joseph Ayo Babalola University, Ikeji-Arakeji, Osun State, Nigeria

### **Abstract**

This study explores the intricate relationship between system-thinking competency, firm age, and economic performance in startups situated in Lagos, Nigeria. Drawing on a sample of 218 startups in Lagos, we investigate the extent to which system-thinking competency influences economic performance and how firm age moderates this relationship. The empirical analysis employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the proposed hypotheses. The findings reveal that system-thinking competency has a positive and significant effect on economic performance in startups in Lagos. Moreover, firm age emerges as a crucial moderator, indicating that the influence of system-thinking competency on economic performance varies across different stages of a firm's lifecycle. These results contribute to our understanding of the dynamic interplay between entrepreneurial competencies, firm characteristics, and business performance. The study underscores the importance of fostering system-thinking skills among entrepreneurs, especially in the context of emerging markets like Lagos, and highlights the strategic implications for startup success in an increasingly complex business environment.

**Keywords:** economic performance, firm characteristic, system-thinking competency

### **Introduction**

The economic performance of startups in Lagos holds a profound significance in the context of regional development and entrepreneurial sustainability. Beyond the traditional focus on financial profitability, sustainable performance emerges as a pivotal determinant of the long-term viability and success of these emerging ventures

(Al Mamun & Fazal, 2021). This holistic perspective extends its purview to encompass a multifaceted spectrum of factors, including social impact, environmental responsibility, and stakeholder satisfaction (Zhang et al., 2022). In Lagos, a bustling metropolis and economic hub of Nigeria, startups are more than just

entrepreneurial endeavours; they are the lifeblood of innovation and economic growth (Disrupt Africa, 2022). These dynamic ventures not only inject fresh ideas and innovation into the local economy but also create job opportunities and stimulate economic growth.

Despite the increasing number of startups in Lagos, Nigeria, and the concerted efforts to boost entrepreneurship and innovation, many startups struggle to sustain and achieve their economic performance and other business objectives. The Small and Medium Scale Enterprises Development Agency of Nigeria reports that a staggering 80 percent of SMEs fail before their fifth anniversary due to harsh economic environments and poor business practices, which have stunted the growth and transition of micro-businesses (Ikpoto, 2023). Research and extant literature have consistently identified poor entrepreneurial competencies as one of the most prevalent issues challenging the growth and performance of startups, including SMEs (Ossai, 2017).

Amid the thriving entrepreneurial landscape in Lagos, one dimension of entrepreneurial competencies that emerges as crucial to the economic performance of startups is system-thinking competency. This competency involves the ability to perceive, analyse, and address complex business challenges with a holistic and interconnected perspective (Hernandez Gonzalez, 2023). In the fast-paced and dynamic environment that startups operate in, system thinking becomes instrumental in navigating the intricate web of factors that influence their performance. System-thinking competency is particularly pertinent in the context of Lagos, where startups face a myriad of challenges, from regulatory hurdles to fierce competition. A startup's ability to adapt, innovate, and make informed decisions in response to these challenges is often contingent upon the extent to which it possesses and utilizes system-thinking skills (Suryani & Hamdu, 2021). These skills enable entrepreneurs to identify the interdependencies among various aspects of their business, ranging from supply chain management to customer acquisition, and make strategic choices that enhance overall performance (Ratinen et al., 2023).

The degree of entrepreneurial behaviour exhibits a correlation with the age of firms, as observed by Kilenthong et al. (2016). While older firms excel in efficiently applying new knowledge to penetrate new markets, they demonstrate reduced effectiveness in leveraging new knowledge for the introduction of novel products or services, as suggested by Naldi and Davidsson (2014). Firm age, as a moderating factor, can significantly impact the relationship between system-thinking competency and economic performance within startups. Younger startups often possess a higher degree of adaptability and innovation, potentially amplifying the positive effects of system-thinking competency on their economic performance. In contrast, older firms may have established routines and structures that could either reinforce or hinder the influence of system-thinking skills (Grillitsch & Schubert, 2021). Thus, considering firm age as a moderator helps us explore how the evolving nature of startups over time interacts with their capacity for holistic problem-solving, ultimately influencing their economic performance in the dynamic entrepreneurial environment of Lagos.

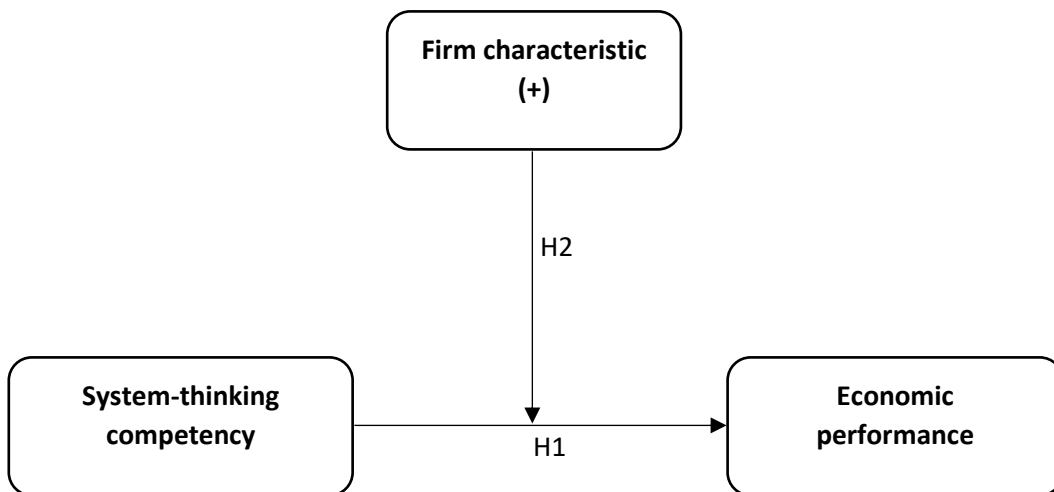
Prior research has highlighted the importance of entrepreneurial skills and strategic thinking in fostering entrepreneurship (Yener, 2022; Jelenc & Pisapia, 2015). Yener (2022) found a positive moderate significant relationship between individuals' entrepreneurship skills and system thinking. Jelenc and Pisapia (2015) demonstrated that entrepreneurs with more developed strategic thinking skills exhibited stronger entrepreneurial behaviours, particularly in terms of proactiveness. In addition, while prior studies, such as those by Petruzzelli et al (2018), Donbesuur et al (2022), Umukoro and Okurame (2018), Chatterjee et al (2021), Luu (2023), Prencipe et al (2018), Zheng et al (2021), Expósito et al. (2019), Mabenge et al. (2022), and Peng et al. (2020), have explored the influence of firm age in diverse contexts, none have specifically addressed the nexus between system-thinking competency and economic performance in Lagos-based startups. This research gap is particularly crucial given the unique entrepreneurial ecosystem in Lagos, where startups play a pivotal role in economic development.

Lagos boasts a dynamic and rapidly evolving business landscape, making it essential to comprehend the interplay between system-thinking competency and the economic performance of startups, with firm age serving as a potential moderating factor.

By focusing on this geographical context and filling this research gap, this study aims to provide valuable insights into how system-thinking competency, coupled with the moderating influence of firm age, impacts the economic performance of startups in Lagos. This research will contribute to a deeper understanding of the dynamics driving startup success and offer practical implications for policymakers, entrepreneurs, and investors looking to foster economic growth in the region. Therefore, this research aims to explore the intricate relationship between system-thinking competency, other firm characteristics, and the economic performance of startups in Lagos, shedding light on the pivotal role of entrepreneurial competencies in driving sustainability and growth in this dynamic entrepreneurial ecosystem. Based on this background, the following objectives were state for the study.

**Research Objectives:**

1. To examine the effect of system-thinking competency on economic performance of startups in Lagos.
2. To investigate the moderating effect of firm characteristic (firm age) on the relationship between system-thinking competency and economic performance.



**Figure 1.** Conceptual model

**Theory and hypothesis development**

The research model in figure 1 forms the basis of the literature review. The study on the moderating effect of firm characteristics, particularly system-thinking competency, on the economic performance of startups in Lagos can be underpinned by the Resource-Based View (RBV) framework. The RBV, as proposed by Barney (1991), offers a valuable theoretical lens for examining the relationship between resources, competencies, and firm performance.

The RBV posits that a firm's competitive advantage and performance can be attributed to its unique bundle of resources, both tangible and intangible. In the context of this study, system-thinking competency can be viewed as an intangible resource possessed by startups in Lagos. This resource heterogeneity, as assumed by RBV, suggests that each organization has its distinctive set of capabilities, which in this case, includes system-thinking skills. Furthermore, RBV emphasizes the concept of

"stickiness" or resource immobility, particularly concerning intangible assets. System-thinking competency, being an intangible resource, may possess characteristics that make it difficult for rival startups to imitate or replicate. This implies that startups with a strong system-thinking competency may enjoy a sustainable competitive advantage, aligning with the RBV's premise. In essence, the RBV framework provides a theoretical foundation for understanding how system-thinking competency, as a valuable and potentially inimitable resource, can influence the economic performance of startups in Lagos. This perspective underscores the significance of intangible resources and competencies in shaping startup success and aligns with the study's objective of exploring the moderating effect of firm characteristics on this relationship.

### **System-thinking competency and economic performance**

System-thinking competency is a pivotal concept within the domain of entrepreneurship, encompassing a diverse set of skills and cognitive abilities that empower entrepreneurs to navigate the complexities of their business environment (Hernandez-Gonzalez, 2023). It involves the capacity to perceive, analyse, and comprehend the intricate web of relationships and interdependencies within the business ecosystem. Entrepreneurs with strong system-thinking competency can transcend reductionist thinking and adopt a holistic approach to problem-solving and decision-making.

At its core, system-thinking competency involves the ability to see the bigger picture beyond isolated components. It encompasses the aptitude to understand how various elements interact and influence each other within a broader ecosystem (Suryani & Hamdu, 2021; Aguilar-Cisneros et al., 2022). This competency empowers entrepreneurs to grasp the underlying patterns, feedback loops, and causal relationships that shape the complex systems in which they operate (Robinson & Molthan-Hill, 2021). It extends beyond traditional linear thinking, emphasizing the interconnectedness of technological, social, environmental, and economic factors.

In today's dynamic and uncertain business landscape, characterized by disruptions and complexities, system-thinking competency plays a pivotal role in decision-making (Ploum et al., 2018; Aguilar-Cisneros et al., 2022). Entrepreneurs with this competency can anticipate the ripple effects of their decisions, enabling them to make informed and strategic choices (Babayayi et al., 2021). Whether it involves identifying supply chain bottlenecks, assessing the environmental impact of product innovations, or understanding the consequences of market shifts, this competency empowers entrepreneurs to make proactive decisions aligned with long-term objectives. Moreover, system-thinking competency is closely linked to sustainable entrepreneurship (Suryani & Hamdu, 2021). Entrepreneurs who grasp the intricate interactions between their business operations and the broader environment are better positioned to integrate sustainability principles into their ventures (Hernandez-Gonzalez, 2023). This competency facilitates the identification of leverage points for positive change, where interventions can yield the most significant sustainable outcomes.

Economic performance, within the context of this study, refers to the financial success and wealth creation achieved by startups in Lagos. It encompasses various financial indicators, including but not limited to return on investment, revenue growth, profitability, market share, and the efficient allocation of resources. Economic performance goes beyond traditional financial reporting, taking into account the social and environmental responsibilities of the organization (Weidner et al., 2021). It assesses the ability of startups to effectively utilize their resources to achieve strong returns on investment and sustainable growth (Harisekar, 2021).

The relationship between system-thinking competency and economic performance is a critical aspect of this study. System-thinking competency equips entrepreneurs with the ability to perceive and

navigate complex business environments, anticipate the consequences of decisions, and integrate sustainability principles into their ventures. As a result, entrepreneurs with higher levels of system-thinking competency are expected to make more informed and strategic decisions that align with long-term economic goals. Therefore, this study proposes the following hypothesis based on this relationship:

**Hypothesis 1:** System-thinking competency has a positive effect on the economic performance of startups in Lagos.

This hypothesis suggests that startups in Lagos with higher levels of system-thinking competency are expected to demonstrate superior economic performance. Their ability to understand and navigate complex systems, anticipate potential ripple effects of their choices, and integrate sustainability principles is likely to contribute positively to their financial success.

#### **Moderating effect of firm characteristic (Firm Age)**

Firm age refers to the duration a company has been in existence since its establishment. It is a key characteristic that distinguishes businesses based on the length of their operational history. Firm age is a fundamental factor in the entrepreneurial landscape as it reflects the maturity, experience, and developmental stage of a company (Luu, 2023). Younger firms are typically in the early stages of development, while older firms have a longer history of operation, potentially spanning decades (Chatterjee et al., 2021).

The moderating effect of firm age on the relationship between system-thinking competency and the economic performance of startups in Lagos is a critical aspect to consider. While system-thinking competency is vital for entrepreneurs in understanding and navigating the complexities of their business environment, its impact can vary depending on the age of the startup (Petruzzelli et al., 2018). Older startups, with a longer history of operation, have had more time to accumulate resources, build networks, and gain experience (Umukoro & Okurame, 2018). This accumulation of resources and experience could enhance the effectiveness of system-thinking competency (Suryani & Hamdu, 2021). These firms might have faced various challenges and learned from past experiences, making them better equipped to apply system thinking to optimize their operations and adapt to changes. System-thinking competency may serve as a complementary tool for these startups to further leverage their accumulated resources effectively (Robinson & Molthan-Hill, 2021). However, younger startups, by virtue of their novelty, may operate in a more dynamic and uncertain environment. System-thinking competency can be particularly valuable for these startups in terms of adaptability and innovation (Hernandez-Gonzalez, 2023). They may need to respond quickly to market shifts, emerging technologies, and changing consumer preferences (Chatterjee et al., 2021). System thinking allows them to perceive the broader picture, anticipate potential ripple effects, and proactively adjust their strategies. In this context, younger startups might experience a more significant positive impact of system-thinking competency on their economic performance. In addition, while older startups have the advantage of accumulated resources, they may also face challenges related to organizational inertia (Luu, 2023). Established processes and systems can sometimes impede innovation and adaptation. Younger startups, with fewer resources but greater flexibility, may rely on system thinking as a means to overcome resource constraints (Petruzzelli et al., 2018). This might lead to a stronger relationship between system-thinking competency and economic performance in younger startups (Umukoro & Okurame, 2018). Understanding how firm age moderates this relationship is crucial for tailoring entrepreneurial strategies and fostering sustainable economic growth in Lagos. Incorporating these insights into the context of startups in Lagos, this study can formulate the following hypothesis:

**Hypothesis 2:** Firm age moderates the relationship between system-thinking competency and the economic performance of startups in Lagos, with the impact of system-thinking competency being more pronounced for younger startups.

This hypothesis suggests that system-thinking competency will have a stronger positive effect on the economic performance of younger startups compared to older ones. Younger startups may benefit more from adopting holistic and adaptive approaches, which are central to system thinking, as they navigate the dynamic and complex business environment of Lagos. Older startups, on the other hand, might rely on more established practices and knowledge, potentially reducing the significance of system-thinking competency in influencing their economic performance.

### **Method**

This study adopts a quantitative research design, as it involves the collection and analysis of numerical data to test hypotheses and answer research questions. Specifically, this research employs a cross-sectional survey to gather data from startups in Lagos, Nigeria. This design allows for the examination of system-thinking competency, firm age, and their interaction as predictors of economic performance. The study focuses on Lagos State, Nigeria, as the primary area of investigation. Lagos, being the commercial and economic hub of Nigeria, hosts a significant number of startups, making it an ideal location to explore the relationship between system-thinking competency, firm age, and economic performance among startups. The population for this study consists of all startups operating in Lagos State, Nigeria. While the precise number of startups may not be readily available, it is estimated that there are several hundred startups in Lagos, given its status as a prominent entrepreneurial ecosystem (Disruptive Africa, 2022). The population of this study is made up of 480 startups in Lagos State Nigerian. (Disrupt Africa 2022). To derive the sample size, the study employs purposive sampling, targeting startups in various sectors such as FinTech, Retail, Mobility, Legal, Social, Distribution, Health, Education, Logistics, and Property. The Taro Yamane Formula ( $n = N / (1 + Ne^2)$ ) is utilized to determine the sample size. Considering the estimated startup population in Lagos, a sample size of 218 is determined as adequate for the study.

Primary data is collected for this research through the use of a structured questionnaire. The questionnaire is designed to measure system-thinking competency, firm age, economic performance, and other relevant variables. It consists of closed-ended questions and employs a Likert scale, ranging from strongly disagree to strongly agree, to capture respondents' perspectives.

In this study, the measurement of System-thinking Competency (STC) was conducted using a scale comprising four items adapted from Ploum et al (2018). To assess the economic performance of the startups, a four-item scale drawn from Maican et al (2021) was employed. Firm Age, on the other hand, was quantified by the number of years each participating firm had been in operation, following the approach utilized by Naldi and Davidsson (2014). These measurement instruments were carefully selected to ensure the accuracy and reliability of the data collected for the analysis, aligning with established methodologies in the relevant literature. The collected data is analysed using a combination of descriptive statistics and structural equation modelling (SEM). Descriptive statistics, such as mean, median, and standard deviation, are used to summarize and describe the data. These statistics provide insights into the central tendency and variability of the variables. SEM is employed to test the research hypotheses and explore the moderating effect of firm age on the relationship between system-thinking competency and economic performance. The analysis involves both measurement model and structural model assessments.

## Results

In this research, the outcomes have been analysed and presented through the utilization of Partial Least Squares Structural Equation Modelling (PLS-SEM). PLS-SEM consists of Measurement and structural model assessment. This choice aligns with common practices in empirical research, as PLS-SEM is highly regarded and widely employed. It offers a range of valuable statistical outputs that enhance the clarity and comprehensibility of research findings. Consequently, the adoption of this analysis method was recommended due to its capacity to provide a lucid and thorough understanding of data analysis processes, methodologies, and measurement validation, as advocated by Sarstedt et al (2016).

### Measurement model assessment

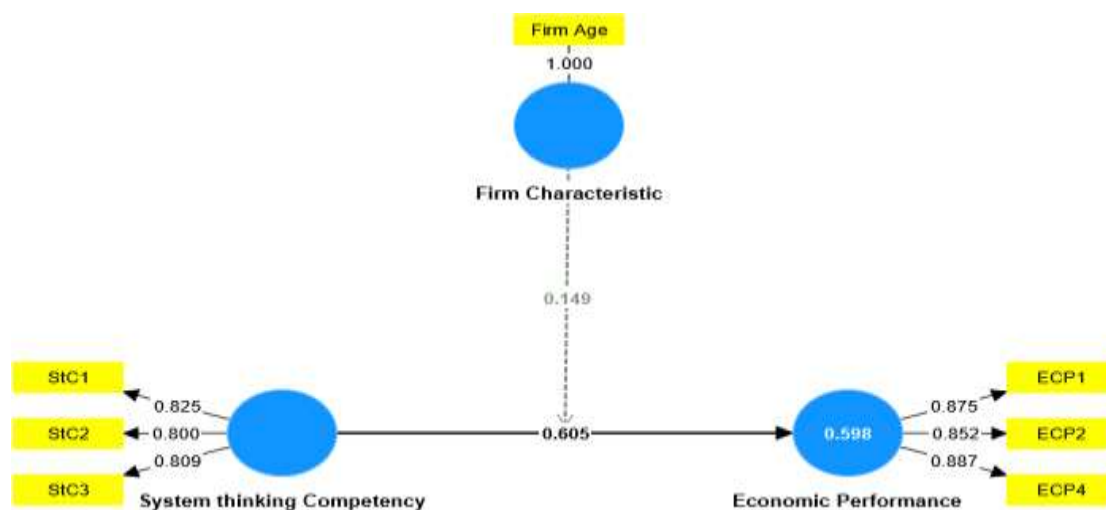
The evaluation process for measuring the model initially involves assessing the essential criteria linked to the validation of indicators used for measurements. This ensures their capability to effectively gauge the respective variables under investigation. The assessment comprises critical tests, as recommended by Hair Jr. et al (2021). For instance, factor loadings for the indicator variables associated with the variables in question indicate the indicators' effectiveness in measuring the intended factors. Additionally, the indicators must undergo reliability testing through well-established methods, including Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's Alpha, which are common in this type of analysis, as suggested by Afthanorhan et al (2020). This approach is vital to assess and confirm the reliability of the variables, contributing to the internal consistency and validity of the study model.

To conduct this test, the study employs PLS-SEM and relies on AVE and CR outputs, and the output from Table 1 and figure 1 indicate satisfactory levels surpassing minimum thresholds. The initial measurement model identified indicators with poor factor loadings (<0.70), particularly one item related to economic performance. To ensure the reliability and validity of the constructs, this item was excluded from the measurement model. Table 1 also showed that convergent validity, assessed through both AVE and CR, demonstrated favorable measurement model outcomes, with values exceeding 0.50 and 0.60, respectively, as recommended by Fornell and Larcker (1981). Furthermore, discriminant validity was evaluated using cross-loadings, following the approach suggested by Henseler et al (2015), to address potential issues related to high interrelationships between latent variables.

**Table 1: Descriptive Statistics, Validity, & Reliability**

Constructs	Items	Mean	SD	FL	VIF	CR	Alpha	AVE
System-Thinking Competency	StC1	3.005	0.767	0.825	1.442	0.853	0.742	0.659
	StC2	3.000	0.702	0.800	1.523			
	StC3	2.965	0.704	0.809	1.468			
Firm Age		2.844	0.936	1.000	1.000			
Economic Performance	ECP1	3.030	0.722	0.875	2.180	0.904	0.842	0.759
	ECP2	3.070	0.691	0.852	1.779			
	ECP4	3.020	0.736	0.887	2.178			

**Note:** SD = Standard deviation, FL = Factor Loading, VIF = variance inflation factor, CR = Composite Reliability, Alpha = Cronbach Alpha, AVE = average variance explained



**Figure 2.** Measurement model

Table 1 provides a summary of the descriptive statistics, validity, and reliability measures for the study constructs. The mean score for StC1 is 3.005, with a standard deviation (SD) of 0.767. The factor loading (FL) is 0.825, indicating a strong association with the latent construct. The Variance Inflation Factor (VIF) is 1.442, which is below the threshold of 5, indicating no issues of multicollinearity. The Composite Reliability (CR) is 0.853, suggesting good internal consistency. The Cronbach's Alpha is 0.742, indicating reliability. The Average Variance Explained (AVE) is 0.659, exceeding the recommended threshold of 0.5, indicating convergent validity. Item StC2 has a mean of 3.000 and an SD of 0.702. The FL is 0.800, indicating a strong association. VIF is 1.523, suggesting no multicollinearity. CR is not shown but is important for construct reliability. Alpha is 0.742, indicating reliability. AVE is not shown but should be assessed for convergent validity. The mean for StC3 is 2.965, with an SD of 0.704. FL is 0.809, indicating a strong association. VIF is 1.468, indicating no multicollinearity. CR is not shown but is important for construct reliability. Alpha is 0.742, indicating reliability. AVE should be assessed for convergent validity. The mean of firm age is 2.844 years, with an SD of 0.936. Since Firm Age is not a latent construct, FL, VIF, CR, Alpha, and AVE are not applicable. The mean score for ECP1 is 3.030, with an SD of 0.722. FL is 0.875, indicating a strong association. VIF is 2.180, which is below the threshold of 5. CR is 0.904, indicating good internal consistency. Alpha is 0.842, indicating reliability. AVE is 0.759, exceeding the recommended threshold. Item ECP2 has a mean of 3.070 and an SD of 0.691. FL is 0.852, indicating a strong association. VIF is 1.779, suggesting no multicollinearity. CR, Alpha, and AVE are not shown but should be assessed for construct reliability and convergent validity. The mean for ECP4 is 3.020, with an SD of 0.736. FL is 0.887, indicating a strong association. VIF is 2.178, which is below the threshold of 5. CR, Alpha, and AVE are not shown but should be assessed for construct reliability and convergent validity. Overall, the results suggest that the System-Thinking Competency and Economic Performance constructs exhibit strong factor loadings, acceptable levels of internal consistency (CR and Alpha) and meet the AVE threshold for convergent validity. Firm Age, being a non-latent variable, is described in terms of mean and SD but does not require reliability and validity assessments.

In this study, essential statistical outputs such as Fornell-Larcker and Heterotrait-Monotrait (HTMT) were provided to assess variable correlations, as displayed in Table 2 and Table 3. To calculate these results, the square root of the Average Variance Explained (AVE) was employed, which is typically highlighted in bold off-diagonal cells, indicating that it surpasses the correlations between constructs



themselves (Fornell & Larcker, 1981). Consequently, the measurement model demonstrated robust findings regarding discriminant validity. Additionally, the study incorporated the HTMT approach as another crucial analysis procedure for evaluating discriminant validity. The outcomes, presented in Table 3, consistently met the recommended threshold of  $\leq 0.90$ , thereby satisfying the key criterion for discriminant validity (Kline, 2015). These results provide satisfactory evidence of discriminant validity for all constructs under investigation.

**Table 2: Fornell-Larcker criterion**

Variables	Economic Performance	Firm Characteristic	System Competency	thinking
Economic Performance	<b>0.871</b>			
Firm Characteristic	0.455	<b>1.000</b>		
System thinking Competency	0.659	0.119	<b>0.812</b>	

**Table 3: Heterotrait-Monotrait ratio (HTMT)**

Variables	Economic Performance	Firm Characteristic	System Competency	thinking
Economic Performance				
Firm Characteristic	0.495			
System thinking Competency	0.826	0.132		

### Structural model assessment

Following the comprehensive assessment of the measurement model using PLS-SEM, the subsequent phase in this analysis involves the evaluation of the structural model. This examination relies on various factors, including path estimates, corresponding t-values, and p-values, which are obtained through the bootstrapping approach, as depicted in Figure 2. The direct effects outcomes, as presented in Table 4, indicate a positive and statistically significant impact of system-thinking competency on the economic performance of startups in Lagos ( $p < 0.05$ ). Consequently, the findings from this research provide robust support for all of the study's hypotheses. Furthermore, the outcomes concerning the moderating influence of firm age on the relationship between system-thinking competency and the economic performance of Lagos startups demonstrate that firm age indeed plays a significant moderating role ( $p < 0.05$ ). Therefore, both Hypothesis 1 and Hypothesis 2 find empirical support in this study.

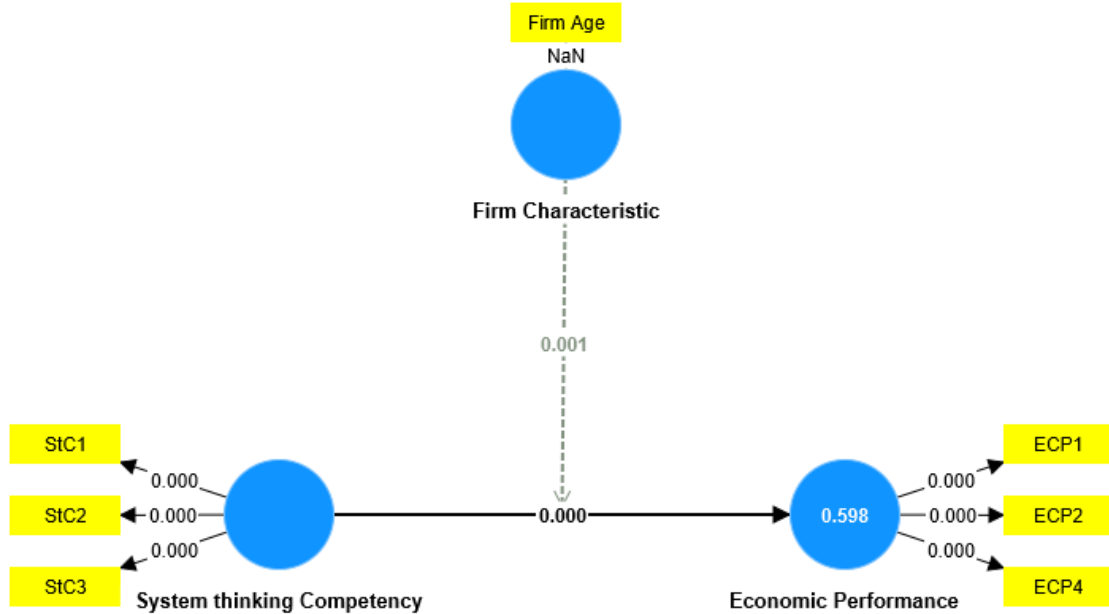
Hypotheses	Beta	T-value	P-value	Result
Firm Characteristic -> EP	0.389	8.275	0.000	Supported
System thinking Competency -> EP	0.605	14.363	0.000	Supported
Firm Characteristic x STC-> EP	0.149	3.366	0.001	Supported

R<sup>2</sup> for Economic Performance is 0.598

EP= Economic Performance, STC= System thinking Competency

As shown in Table 4, An R-squared value of 0.598 for Economic Performance indicates that approximately 59.8% of the variability in the economic performance of startups in Lagos can be

explained by the variables included in your model. In other words, system-thinking competency and account for nearly 60% of the changes observed in the economic performance of these startups.



**Figure 3.** Structural model

### Discussion

The research findings of this study have significant implications for understanding the relationship between system-thinking competency, firm age, and economic performance in startups, particularly in the context of Lagos. The study found that system-thinking competency has a positive effect on the economic performance of startups in Lagos. This suggests that entrepreneurs who possess the ability to think holistically, consider complex interdependencies, and navigate intricate business ecosystems are more likely to achieve better economic performance. This finding underscores the importance of nurturing and developing system-thinking competency among entrepreneurs, especially in dynamic and interconnected business environments. The study corroborates earlier research that has indicated the influence of firm age on various aspects of entrepreneurship and performance. Petruzzelli, Ardito, and Savino (2018) found that older firms outperform younger ones under certain conditions. Similarly, the current study suggests that firm age moderates the impact of system-thinking competency on economic performance, highlighting the evolving nature of firm capabilities.

The research also revealed that firm age plays a significant moderating role in the relationship between system-thinking competency and economic performance. Specifically, it highlights that as startups mature with age, the impact of system-thinking competency on economic performance becomes more pronounced. Younger firms may benefit from system-thinking competency, but this effect becomes increasingly substantial as firms grow older. This emphasizes the evolving nature of entrepreneurial capabilities and their influence on performance over the lifecycle of a startup. The research connects well with the empirical review's emphasis on system-thinking competency's role in sustainable entrepreneurship. The ability to understand and manage complex relationships within business ecosystems, as emphasized by the study, aligns with the idea that entrepreneurs with this competency can better integrate sustainability principles into their ventures (Hernandez-Gonzalez, 2023). This finding resonates with the growing importance of sustainability in today's business landscape.

System-thinking competency can be viewed as a valuable resource within the RBV framework. Entrepreneurs who possess this competency have a distinctive capability that can contribute to the competitive advantage of their startups. This study's findings reinforce the idea that such a capability positively affects economic performance, aligning with RBV's emphasis on the strategic importance of unique resources. Firm age, as demonstrated by this study, serves as a moderator that influences how system-thinking competency translates into economic performance. This aligns with RBV's recognition that resource value and competitive advantage may evolve over time. In the context of startups, as they mature and accumulate resources, the impact of system-thinking competency on economic performance may become more pronounced, reflecting the dynamic nature of resource-based advantages. In summary, this study's findings offer valuable insights into the interplay of system-thinking competency, firm age, and economic performance in startups. These insights resonate with the empirical review and align with the RBV framework by emphasizing the role of unique capabilities, such as system-thinking competency, in driving competitive advantage and performance outcomes.

### **Conclusion and Recommendation**

In conclusion, this study has shed light on the intricate relationship between system-thinking competency, firm age, and economic performance in startups operating in Lagos, Nigeria. The findings reveal important insights that have practical implications for entrepreneurs, policymakers, and business stakeholders. First and foremost, the research has demonstrated that system-thinking competency is a valuable asset for startups seeking to enhance their economic performance. Entrepreneurs who possess the ability to think holistically, consider complex interdependencies, and navigate the multifaceted business landscape are more likely to achieve better economic outcomes. This underscores the importance of nurturing and developing system-thinking competency among entrepreneurs, especially in the context of Lagos' dynamic and interconnected business environment. Furthermore, the study has highlighted the moderating role of firm age in this relationship. As startups mature with age, the impact of system-thinking competency on economic performance becomes more pronounced. This suggests that younger firms may benefit from system-thinking competency, but the effect becomes increasingly substantial as firms grow older. Entrepreneurs and investors should recognize that the value of system-thinking competency evolves over the lifecycle of a startup.

Based on the research findings, several recommendations can be made:

Policymakers and business support organizations should consider designing and implementing training programs that specifically target the development of system-thinking competency among entrepreneurs. These programs should equip startup founders with the skills and knowledge needed to understand and navigate complex business ecosystems. Entrepreneurs should adopt a long-term perspective when assessing the impact of system-thinking competency on economic performance. Recognize that the benefits of this competency may become more apparent as the startup ages. Therefore, maintain a commitment to continuous learning and development in this area. Encourage startups to engage in research and innovation efforts that leverage system-thinking competency. This can involve exploring innovative business models, partnerships, and sustainability initiatives that align with the holistic thinking approach.

### **Limitations and future research directions**

While this study has made significant contributions to our understanding of the relationship between system-thinking competency, firm age, and economic performance in startups in Lagos, it is essential to acknowledge certain limitations that provide avenues for future research. Firstly, the study relied on cross-sectional data, which limits our ability to make causal inferences. Future research could employ

longitudinal designs to capture the dynamics of system-thinking competency development and its impact on startups over time. Secondly, the research focused on startups in Lagos, which may not fully represent the diversity of startups in different regions and industries. Expanding the study to encompass a more extensive geographical scope and diverse business sectors would enhance the generalizability of the findings.

Future research could benefit from incorporating objective performance metrics and external evaluations to strengthen the robustness of the findings. Furthermore, while the study investigated firm age as a moderator, other contextual factors, such as industry-specific characteristics, market volatility, and access to resources, were not extensively explored. Future research could delve deeper into these contextual variables to gain a more comprehensive understanding of their role in shaping the relationship between system-thinking competency and economic performance. Lastly, the study primarily focused on economic performance as the outcome variable. Future research could extend the investigation to include a broader set of performance measures, encompassing social and environmental dimensions, aligning with the principles of sustainability and Corporate Social Responsibility (CSR).

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