

Global Innovation Capital Funding and Financial Literacy as Determinants of Digital Payment Technology Startup Performance

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Abstract

As digital payment technology startups come to play a growing role in promoting financial inclusion and digital transformation, the need to understand the factors that can boost their performance as organisations has grown. Although the number of investments in entrepreneurial activities has increased, little empirical research has been conducted on the effect of VCM practices on the performance of digital payment technology startups in the context of the global innovation capital funding process, especially in emerging economies. This study has focused on the effect of venture capital management practices on the financial performance of digital payment technology start-up in Nigeria. A quantitative cross sectional survey design was used, and primary data were gathered using a structured questionnaire which was administered to the management personnel of digital payment technology startups. Partial Least Squares Structural Equation Modelling (PLS-SEM) software program, SmartPLS 4, was used for data analysis. The results show that the venture capital financial management practices have a significant effect on Return on Equity ($\beta = 0.745$, $t = 14.838$, $p < 0.001$) and effective management practices have a significant effect on Return on Assets ($\beta = 0.810$, $t = 21.092$, $p < 0.001$). The study finds that the performance gains of global innovation capital funding are not only related to the availability of external funding, but also to the effective management and financial management of startups. The study adds to the entrepreneurial finance literature by showing that managerial ability is essential to the ability of venture capital to create sustainable organisational performance. The results offer practical recommendations for entrepreneurs, investors and policy makers to enhance Nigeria's digital innovation ecosystem.

Keywords: Global innovation capital funding; Digital payment technology startups; Fintech; Venture capital management practices; Startup performance

Introduction

Digital technologies have revolutionised the financial services sector and opened up new opportunities for innovation, entrepreneurship, and financial inclusion around the world. One of the most important developments is the rise of digital payment technology start-ups, which have transformed the payment systems by way of mobile applications, digital wallets, online payment gateways, blockchain technologies, and application programming interfaces (APIs). These innovations have enhanced the speed, availability, and security of financial transactions, and increased access to formal financial services for individuals and businesses. Therefore, digital payment technology startups are crucial actors in digital

economic development and national competitiveness, especially in the emerging economies where digital financial services are still growing (World Bank, 2024).

As the digital payment technology startups continue to grow, the demand for external funding to facilitate innovation, product development, market expansion, regulatory compliance, and technological infrastructure has also risen. In the case of technology startups, the initial investment is usually high and returns are not guaranteed until the company becomes profitable. Whereas traditional small businesses can make a profit sooner, technology startups need a significant amount of investment before they can start making a profit. Thus, global innovation capital funding, especially venture capital (VC), has become a significant source of funding for fast-growing and competitive entrepreneurial companies. In addition to financial investment, global innovation capital can offer innovative startups strategic networks, technical expertise, managerial support, and access to international markets, improving their growth potential (OECD, 2024; Gompers & Wang, 2024).

Even as access to VC funds has grown, startup performance is very unevenly distributed across countries and industries. Some companies that are financed by venture capital end up making quick money and profiting from it, while others do not convert the capital invested into long-term performance of the organisation. This indicates that having innovation capital doesn't ensure business success. Instead, the value of venture capital is found in the strategic use of investment resources in entrepreneurial companies. The management of VCs (strategic planning, governance, investment monitoring, budgeting, financial control and accountability) has thus become an important organisational ability that affects the ability of startups to translate external investment into better financial results (Croce, Martí, & Murtinu, 2024).

In the last 10 years, the Nigerian fintech sector has seen unprecedented development, with digital payment technology startups gaining traction in both domestic and international markets through an increasing amount of VC funding. The country's growing digital economy, young population, high mobile phone penetration, and financial inclusion programs have put the country in a good position as a fintech hub. Nigeria has been reported to be a significant market for fintech investment in Africa and digital payment startups are one of the most rapidly expanding areas of the entrepreneurial landscape (KPMG, 2024). However, even with the confidence of investors, many start-ups still suffer from financial instability, poor governance, funding problems and inefficiencies in the operation. These challenges warrant a consideration of the effectiveness of the venture capital's management in achieving sustainable organisational outcomes.

While some work has been done on venture capital, entrepreneurial finance, and the performance of startups, much of the existing literature is largely limited to the developed world and its access to finance or investment decisions, or its innovation outcomes. In comparison, fewer studies have studied the effect of VC management practices on the financial performance of DPTS, especially in the context of global innovation capital funding in emerging economies like Nigeria. Furthermore, previous studies have largely focused on the venture capital as a single financial source and have neglected to examine the managerial skills needed to convert external investment into measurable organisational results. This is a significant theoretical and empirical void as organisational performance is not only a function of the availability of resources, but also how effectively they are used.

The theory used to support this study is Dynamic Capabilities Theory (DCT) that suggests sustainable organisational performance will rely not only on the availability of valuable resources but also on the capacity of a firm to integrate, build, and reconfigure internal and external resources to respond to the changing environment (Teece, Pisano, & Shuen, 1997; Teece, 2007). Therefore, the purpose of this study is to suggest that global innovation capital funding is a strategic financial resource necessary for innovation and growth, and the management of venture capital is a dynamic capability that can make the

best use of innovation capital funding for improving organizational performance. Specifically, the venture capital management practices are conceptualized in two complementary dimensions: a strategic planning, governance, monitoring and investment decision making dimension, and a financial management dimension including budgeting, financial control, accountability, and efficient resource allocation. These management skills empower digital payment technology startups to continuously adjust to the evolving market dynamics, make the best use of innovation funds, enhance their operational efficiency, and deliver better financial results. The study therefore investigated the effect of venture capital management practices on the performance of digital payment technology startups in Nigeria with Return on Assets (ROA) and Return on Equity (ROE) as indicators of financial performance. The study fills an important gap in the area of entrepreneurial finance and shows that the value of global innovation capital funding also relies on the managerial skills used for managing investment resources.

The research has three significant impacts. First, it adds to the Dynamic Capabilities Theory by clarifying how the management practices of venture capitalists convert innovation capital investments on a global scale into tangible organisational outcomes. Second, it combines strategic management and financial management aspects into one analytical model for evaluating the performance of digital payment technology startups. Third, it offers empirical evidence from Nigeria, which helps to expand the limited literature on venture capital management in emerging digital economies and offers practical lessons for entrepreneurs, investors, and policymakers to enhance innovation ecosystems and sustainable fintech development.

Literature Review

Global Innovation Capital Funding

Innovation is a key component of the economy, technological development and entrepreneurs' competitiveness in the twenty-first century. In an increasingly digital world, new businesses are increasingly relying on outside sources of funding to create new technologies, commercialise their products, and grow their businesses. As a result, Global Innovation Capital Funding (GICF) has become a vital part of entrepreneurial ecosystems, bringing in the financial resources needed to support high-growth, innovation-centric businesses. Innovation capital is different from traditional business financing, which is mostly debt-based and reserved for established companies with tangible assets and well-documented research and development (R&D) investments. In contrast with the traditional business finance, which is mostly debt-based and reserved for established companies with tangible assets and well-documented research and development (R&D) investments, innovation capital is targeted at ventures that are characterised by technological uncertainty, intangible assets, and significant investments in research and development (R&D). (OECD, 2024)

Global Innovation Capital Funding is the process of mobilising and allocating financial resources across countries and institutions to support the development of innovative businesses in their creation, development, commercialisation and expansion. It covers various funding models such as corporate venture capital, government innovation funds, incubators, accelerator programmes, angel investors, and venture capital. All of these sources of finance have varying investment goals, risk appetites and business development phases, but they all serve to bolster innovation ecosystems and support entrepreneurs to grow (World Bank, 2024). Governments also support private investment with innovation grants, tax incentives, startup laws and public-private partnerships to alleviate financing barriers and promote tech entrepreneurship (OECD, 2024).

Of these financing options, venture capital is now the main source of innovation capital for tech startups worldwide. Venture capital is equity investment by professionally-managed capital providers in firms

with high levels of technological and market uncertainty, but with significant growth potential. Venture capitalists assess companies for innovation potential, scalability, and future growth potential, rather than collateral or past financial results, unlike traditional lenders (Lerner & Nanda, 2020). In addition to financial capital, VC firms offer strategic guidance, board level support, management skills and connections that enhance the ability of companies to commercialise their innovation and to survive in competitive markets (Gompers & Wang, 2024). As such, VC is widely understood to be a valuable asset for entrepreneurs, and a source of knowledge and managerial skills that can improve their chances of success, as well as financial capital.

Venture capital plays a crucial role in the digital payment technology industry, where startups need significant capital to build payment platforms, cloud-based systems, cybersecurity, regulatory compliance frameworks, and customer acquisition strategies. The traditional methods of financing are not sufficient for the growth needs of these companies, as they are dealing with a rapidly changing business landscape, facing intense competition, and experiencing technology disruption and evolving regulatory rules. Industry reports have recently shown that fintech is still the top VC investment sector globally, and Africa, especially Nigeria, continues to be a hot VC investment destination due to the rapid growth of digital financial services and the rising demand for cashless payment solutions (KPMG, 2024; Partech Africa, 2024).

While venture capital is a crucial component, it's not the only one that can make an organisation successful. New research increasingly suggests that the value of innovation capital to the performance of the firm relies on the management of the investment resources after acquisition. Venture capital gives start-ups the financial means to innovate and grow, but poor planning and governance, financial control and investment resource allocation can significantly impact VC contribution to organisational performance (Croce, Martí, & Murtinu, 2024). This focus moves away from the question of innovation finance to the question of how venture capital is managed to yield sustainable competitive advantage and better financial results.

In this study, global innovation capital funding is considered the larger financing system in which VC is the main way to provide financing for digital payment technology startups. It also suggests that the outcomes from innovation capital depend on the management practices that are implemented by the innovation companies. This sets the groundwork for the analysis of venture capital management practices as an important factor in the performance of digital payment technology startups.

Venture Capital Management Practices

Venture capital management practices are the strategic, operational and financial activities used to plan, allocate, monitor and control the investment resources of a venture-backed firm in order to optimize the performance of the organization and the value to investors. While VC funding can give startups the capital they need to innovate and grow, its impact is heavily reliant on the way the capital is utilized once invested. Venture capital management, therefore, does not only involve raising capital but also governance arrangements, strategic planning, financial management, tracking investments, accountability, and resource allocation, all of which can influence the success of external capital in securing sustainable growth of the business (Gompers & Wang, 2024).

Venture capital from the Dynamic Capabilities Theory is seen as a valuable external resource that can only be used to create competitive advantage if the firms have the management skills to use them effectively (Barney, 1991). In the realm of digital payment technology startups, these features are especially crucial due to the dynamic nature of the industry, which is marked by rapid advancements in technology, shifting regulatory standards, and significant investment in software development,

cybersecurity measures, digital infrastructure, and market penetration. Therefore, effective VC management is crucial to ensure a balance between innovation and efficiency, and sustainability over the long haul (Croce, Martí, & Murtinu, 2024).

The literature indicates that there are two dimensions to venture capital management practices that are complementary. The first is the effective management of venture capital, which involves strategic planning, governance, monitoring of investments, assessment of performance and decision making processes that ensure that the venture capital is applied to activities that will create sustainable organisational value. Good governance and ongoing performance tracking allows startups to adapt quickly to technological and market shifts, and decrease managerial inefficiencies. Chemmanur, Krishnan, and Nandy (2022) found that high-quality governance and strategic management systems in the venture-backed firms resulted in better innovation and growth performance than those with low-quality governance and strategic management systems. In the same way, Croce et al. (2024) suggest that, in addition to monetary investment, the value added by venture capital is also due to the quality of managerial practices that coordinate organisational resources and strategic choices.

The second aspect is the financial management practices of the venture capital, focusing on budgeting, cash-flow management, expenditure control, financial reporting, investment evaluation and prudent use of the funds of the venture capital. These practices help to ensure that the financial resources are used efficiently, and that there is a sufficient liquidity and continuous innovation. For digital payment technology startups, financial management is especially crucial due to their significant capital needs and unpredictable income. According to Brigham and Ehrhardt (2022), good financial management can help an organisation run more efficiently by making better investment choices and utilizing resources to their maximum potential. Similarly, Adomako, Danso, and Ofori Damoah (2023) observed that companies that were more financially competent had higher profitability and growth rates as a result of better financial resource utilization.

While prior research has recognized VC's role in facilitating entrepreneurial development, the literature has largely been concerned with the supply of VC funds and not with the managerial practices that enable VC-backed firms to convert VC funding into better organizational performance. There is limited research that focuses on the effect of management practices and financial management practices on the performance of digital payment technology startups, especially in emerging economies like Nigeria. This is significant as it is unlikely that VC will drive long-term performance improvements without good strategic governance and effective financial management. Accordingly, this study conceptualises venture capital management practices as a multidimensional organisational capability comprising effective management and financial management practices that together enhance the performance of digital payment technology startups.

Digital Payment Technology Startup Performance

The digital payment technology startup landscape has emerged as a key player in the digital economy, creating innovative payment solutions that enable secure, efficient, and accessible financial transactions. These companies are using digital tools like mobile apps, cloud-based solutions, blockchain, artificial intelligence, and application programming interfaces (APIs) to optimise payment processes, drive financial inclusion, and enhance customer experiences. With increased competition in the fintech sector, assessing the performance of digital payment technology startups is becoming increasingly crucial for investors, policymakers, entrepreneurs, and other stakeholders to gauge the sustainability and value-creation potential of these initiatives (Bhullar, Gupta and Salamzadeh, 2025; Srivastava, 2025; World Bank, 2024).

Organisational performance is mainly the ability of an organisation to meet its strategic and financial goals using the most efficient use of available resources. Financial indicators, growth measures, innovation outputs, customer acquisition, market share and operational efficiency are all commonly used measures of startup performance in entrepreneurship and innovation research (Delmar, Davidsson, & Gartner, 2003). Financial performance is one of the most accepted measurements, however, as it shows the firm's efficiency to use resources and create value for investors and other stakeholders (Brigham & Ehrhardt, 2022).

Return on Assets (ROA) and Return on Equity (ROE) are considered as good financial indicators of the organisation. ROA measures the effectiveness of a company's management in using its overall assets to make a profit, and thus indicates the effectiveness of the management of the resources of the organisation. ROE, on the other hand, shows how well the company uses shareholder funds, and it is used to gauge the company's ability to generate value from its owner's equity (Gitman, Juchau, & Flanagan, 2021, Adesopo & et. Al, 2025). These indicators combine to give a thorough picture of operational efficiency and financial performance, ideal for assessing the efficiency of a venture-backed startup and the satisfaction of the investors' expectations for investment returns.

Financial performance is strongly linked to the capacity for digital payment technology startups to turn investment into long-term success. External financing can help companies invest in technology development, infrastructure, cybersecurity, regulatory compliance, and market expansion, but the real key to making money is the effective management of these resources. Companies that wisely invest VC funds, manage their finances properly, and establish good governance are more likely to enhance asset efficiency, boost profitability, and yield better returns to investors. Thus, the success of digital payment technology start-ups is not just a function of the amount of innovation capital available, but also of the quality of the venture capital management practices employed by entrepreneurial firms.

Therefore, the performance assessment of a digital payment technology startup is done by Return on Assets (ROA) and Return on Equity (ROE). These indicators offer objective metrics that are consistent with the study's focus on how global innovation capital funding and venture capital management practices impact on the organisation's outcomes.

Global Innovation Capital Funding and Venture Capital Management Practices and Digital Payment Technology Startup Performance.

With the growing recognition of the role of technology-driven enterprises in fostering innovation, employment and economic growth, the relationship between innovation financing and startup performance has garnered more scholarly interest. The literature broadly confirms that access to innovation capital has a positive effect on startups' ability to commercialise new technologies, grow their businesses and increase their competitiveness (Zhou et al., 2025; Mirza et al., 2026; Kato and Manchidi, 2025). There is, however, a growing consensus that the performance effects of innovation capital do not only rely on the availability of external finance, but also on the managerial capacity that is exerted in the use of investment resources in entrepreneurial firms.

Research on the impact of global innovation capital funding has consistently found that there is a positive correlation between the growth of startups and the venture capital investment. According to Lerner and Nanda (2020), VC firms lower the financing hurdles for innovative companies and offer strategic advice and connections to help companies commercialize and expand markets. Likewise, Gompers and Wang (2024) demonstrated that technology companies with venture capital funding tend to grow faster, generate more innovations, and perform better on the market compared to companies that only have traditional

funding. The results indicate that innovation capital is a broader concept than financial capital, as it is also a source of complementary strategic resources to enhance entrepreneurial capability.

But other researchers argue that the differences in start-up performance can't be attributed to differences in VC. In a detailed review of VCs literature, Croce et al. (2024) noted that the performance of VCs that invest in similar companies is often found to differ significantly due to differences in governance, management, and allocation of resources. Similarly, Brown et al. (2024) determined that managerial competence plays a significant role in the relationship between external financing and firm growth, suggesting that capital is just one factor that contributes to entrepreneurial success. Such research suggests that the ability of the organisations is the key to whether VC investments lead to ongoing financial results.

This is why the importance of venture capital management practices in maximising the value of innovation funding is increasingly highlighted from empirical evidence. Chemmanur, Krishnan, and Nandy (2022) found that the venture-backed companies with good governance, strategic planning, and active participation of investors exhibited better innovation performance and revenue growth compared to the companies with poor management. Likewise, Adomako, Danso and Ofori Damoah (2023) concluded that companies that practised disciplined financial management – budgeting, expenditure control, financial monitoring – had better profitability and organisational growth. The results support the hypothesis that good management and sound financial management can help entrepreneurial companies to use venture capital more efficiently and enhance the investment results.

In the fintech industry, this is another example of the critical need to connect innovation investment with good management. While investors remain confident in fintech, KPMG (2024) noted that companies in highly dynamic digital sectors are under greater pressure than ever before to prove their governance, financial management and long-term business models, before they can be attractive to investors. Likewise, OECD (2024) states that companies with structured governance and transparent financial management are more resilient, have higher investor confidence, and survival rates compared to those with weak managerial controls. The results indicate that not only the volume of venture capital received, but also the efficiency of the use of investment resources, are important for financial performance.

While the work of other researchers has shed light on entrepreneurial finance and startup performance, there are a number of limitations. First, a lot of the existing evidence comes from developed economies where the venture capital market, institutional settings and entrepreneurial ecosystems are very different from those of emerging economies. Second, numerous studies focus on venture capital, financial management or startup performance as separate entities rather than in a single analytical framework. Third, there are relatively few empirical studies that specifically address digital payment technology startups, even though they are becoming a key part of financial inclusion, digital transformation and economic development. Thus, the limited evidence available on the combined effect of global capital funding for innovation and venture capital management on the financial performance of digital payment technology startups in Nigeria is limited.

This study aims to fill these gaps by bringing together the three elements of global innovation capital funding, venture capital management practices and digital payment technology startup performance under a single analytical framework. In contrast to earlier research, which mainly emphasises the availability of VC funding, the current research suggests that the performance implications of VC funding depend on the quality of managerial and financial management. The study not only adds to the literature on entrepreneurial finance, innovation management, and public administration, but also provides evidence that can inform policymakers who wish to build innovation ecosystems and digital entrepreneurship in emerging economies by examining the impact of venture capital effective management practices on Return on Assets (ROA) and venture capital financial management practices on Return on Equity (ROE).

Theoretical Framework

Dynamic Capabilities Theory

The Dynamic Capabilities Theory (DCT) by Teece, Pisano and Shuen (1997) and later by Teece (2007) is the theory that serves as a basis for this study. The theory grew out of the Resource Based View (RBV) theory to account for how firms maintain competitive advantage in fast changing and very competitive markets. The RBV proposes that the performance of an organisation is dependent on the possession of valuable, rare, inimitable and non-substitutable resources (Barney, 1991), while Dynamic Capabilities Theory suggests that the sustained success of an organisation relies on the ability to integrate, build and reconfigure internal and external resources to meet changing environmental conditions (Teece et al., 1997; Teece, 2007). Dynamic Capabilities Theory is still one of the most prevalent theories used to explain how organisations adapt, innovate and grow in volatile business environments in recent studies (Teece, 2023; Schilke, Hu, & Helfat, 2023).

Dynamic capabilities are defined as the organisational and managerial processes that enable firms to sense opportunities and threats, to seize opportunities that arise, and to transform organisational resources to maintain their long-term competitive advantage (Teece, 2007). Dynamic Capabilities Theory (DCT) differs from the Resource Based View in that it highlights the managerial capabilities that allow organisations to continuously transform and reconfigure their resource base to adapt to technological, market and institutional change (Helfat & Martin, 2015). For tech start-ups, this is especially true, as they rely on ongoing innovation, strategic agility, and smart resource allocation for their survival.

The theory is particularly relevant to digital payment technology startups, which are one of the fastest growing areas of the digital economy. These companies are grappling with rapid technological changes, changing customer preferences, growing cybersecurity risks, and fierce competition and frequent regulatory shifts. Therefore, they are not only financially dependent on external funds but also on their ability to adjust their organisational strategies and to manage external investments effectively in the long term. Recent entrepreneurship literature indicates that startups with greater dynamic capabilities are more likely to be able to innovate, expand, and adapt to uncertainty in the market than firms that are only financially capable (Warner & Wäger, 2019; Teece, 2023).

Global Innovation Capital Funding in this study is an external strategic resource that supports digital payment technology startups to fund technological innovation, product development, digital infrastructure, regulatory compliance, market expansion and organisational growth. Beyond being a financial investment, global innovation capital also helps to connect with international investors, strategic partnerships, technical expertise, and global entrepreneurial networks (OECD, 2024; Gompers & Wang, 2024). However, innovative capital does not necessarily lead to better organisational results. Past research shows that companies funded with comparable amounts of VC can be found to have varying performance results, depending on their managerial skills, governance structure, and allocation of resources (Croce, Martí, & Murtinu, 2024).

In this study, these managerial capacities are defined as Venture Capital Management Practices, which consists of Venture Capital Effective Management Practices and Venture Capital Financial Management Practices. Strategic planning, governance, monitoring of investments, coordination of the organisation, and managerial decision making that ensures alignment of venture capital with the goals of the organisation are a few of the venture capital effective management practices. The financial management practices of venture capital are budgeting, financial reporting, expenditure control, cash flow management, investment evaluation, and accountability mechanisms that facilitate the efficient use of venture funds. In the context of Dynamic Capabilities Theory, these practices are organisational capabilities that facilitate the integration, deployment and reconfiguration of financial resources to

enhance organisational outcomes, particularly in the context of startups. This is in line with Teece's (2007) hypothesis that managerial competence is a key factor in the ability of firms to convert valuable resources into a sustained competitive advantage.

The result of these dynamic capabilities is seen in Digital Payment Technology Startup Performance measured by Return on Assets (ROA) and Return on Equity (ROE) in this study. These are measures that reflect the efficiency with which the startups use their organisational resources and shareholder investments to create financial returns. Ventures with more capable venture capital management firms are therefore likely to have better financial performance as they invest their resources more strategically, increase operational efficiency and adapt more effectively to market changes. Recent research also shows that managerial skills are important in bolstering the link between external financing and firm performance through their impact on innovation, resource use, and organisational resilience (Schilke et al., 2023; Teece, 2023).

The Dynamic Capabilities Theory thus offers a strong theoretical framework for the relationships explored in this study. It states that the global innovation capital funding represents the strategic financial resources that are needed for the growth of the startups, while the venture capital management practices are the dynamic organisational capabilities that are needed to successfully deploy these strategic financial resources and improve the performance of the startups. The theory thus backs the main thesis that sustainable financial performance with digital payment technology startups is not only dependent on attracting VC investments, but also on building the managerial skills to continuously invest, monitor, and reconfigure investments as the business environment changes.

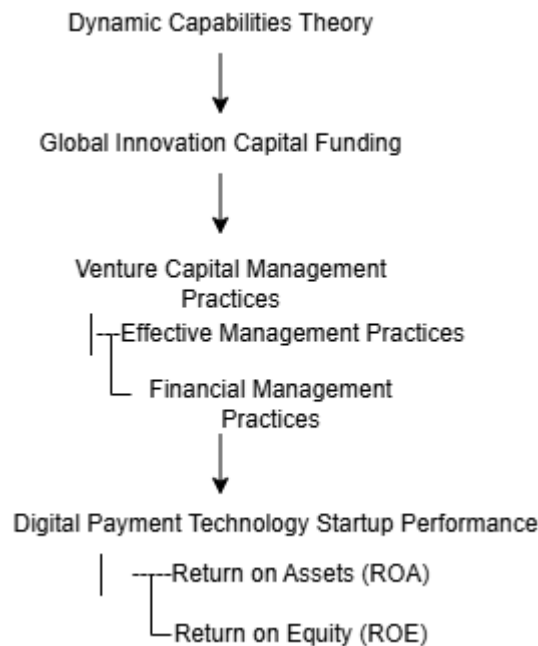


Figure 1: Conceptual Framework

Hypothesis Development

According to the Dynamic Capabilities Theory, the performance of an organisation is dependent on the effective use of valuable resources via suitable managerial abilities. In digital payment technology startups, global innovation capital funds the resources needed for growth and innovation, and venture

capital management processes define the effectiveness of these resources in delivering organisational outcomes. Past empirical evidence suggests that companies with better governance, resource allocation and financial management practices are more likely to outperform companies with poor governance, resource allocation and financial management practices (Chemmanur et al., 2022; Adomako et al., 2023). Based on the findings of this study, grounded in the Dynamic Capabilities Theory and the empirical evidence, that digital payment technology startups can better perform financially when they receive the support of effective VC management practices in the context of the availability of global innovation capital funding. Based on this, the following hypotheses are tested:

H₀₁: Venture capital effective management practices have no significant effect on the Return on Assets (ROA) of digital payment technology startups.

H₀₂: Venture capital financial management practices have no significant effect on the Return on Equity (ROE) of digital payment technology startups.

Methodology

Research Design

The research design of this study was quantitative with a cross-sectional survey approach, which aimed to explore the impact of venture capital management practices on the performance of digital payment technology startups in the context of global innovation capital funding. The quantitative approach was deemed suitable as it allows for the empirical testing of hypothesised relationships between the latent constructs through statistical methods, and the cross-sectional design allowed for data collection from respondents at one point in time (Saunders, Lewis, & Thornhill, 2023).

Population, Sample and Data Collection

The study was focused on the digital payment technology startups in Nigeria. The primary data were gathered using a structured questionnaire, which was administered to the founders, chief executive officers, finance managers, operations managers and other senior management personnel who were involved in the financing and strategic decision making of the firm. These respondents were chosen because they have good knowledge of the use of VC, managerial practices and organisational performance.

Measurement of Variables

There were two parts to the questionnaire. The first collected the demographic and organisational characteristics of the captured respondents, while the second collected the study variables using multiple item scales based on previous entrepreneurship, venture capital and financial management studies. The answers were rated on a 5 point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). An independent construct, venture capital management practices, was operationalised in two dimensions: Venture Capital Effective Management Practices (VCEMP) and Venture Capital Financial Management Practices (VCFMP)

Two widely used financial measures were used to evaluate startup performance: Return on Assets (ROA) and Return on Equity (ROE). The indicators offer objective measures of managerial efficiency and shareholders' returns and are often utilised in entrepreneurial finance studies (Brigham & Ehrhardt, 2022).

The Reliability and Validity of the Measurement Model

Cronbach's alpha, Composite Reliability (CR), Average Variance Extracted (AVE), and discriminant validity were used to evaluate the measurement model. The reliability statistics show acceptable internal consistency of the constructs. The Cronbach's alpha, Composite Reliability and AVE for Venture Capital Effective Management Practices were 0.791, 0.857 and 0.545, respectively; and the Cronbach's alpha, Composite Reliability and AVE for Return on Assets were 0.757, 0.845 and 0.579, respectively. Similarly, Venture Capital Financial Management Practices had a Cronbach's alpha of 0.757, a Composite Reliability of 0.846, and an AVE of 0.580, while Return on Equity had a Cronbach's alpha of 0.771, a Composite Reliability of 0.840, and an AVE of 0.521. The reliability coefficients were all above the recommended level of 0.70, and the AVE values were above 0.50, which indicates that the internal consistency and convergent validity were satisfactory (Hair et al., 2022). The Fornell–Larcker criterion was used to test the discriminant validity. The square root of the AVE of each construct was higher than the respective inter-construct correlations, which suggests that the latent variables were empirically distinct and measure different theoretical concepts.

Data Analysis

Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to analyse the data by SmartPLS 4. The selection of PLS-SEM was justified due to its suitability for analysing complex relations between latent constructs, which is widely used in entrepreneurship, innovation and management research (Hair et al., 2022). The analysis was carried out in two stages as suggested by Hair et al. (2022). The measurement model was first assessed using the reliability and validity indicators. Secondly, the structural model was evaluated by bootstrapping to estimate path coefficients (β), standard errors, t-statistics, p-values and coefficients of determination (R^2). A 5% significance level was used to determine statistical significance.

Results

Measurement Model Assessment

The measurement model was tested to ensure the reliability and validity of the study constructs prior to testing the structural relationships. The internal consistency reliability was tested by Cronbach's alpha and Composite Reliability (CR), and the convergent validity was tested by Average Variance Extracted (AVE). All constructs met the recommended values suggested by Hair et al. (2022) as presented in Table 1, with Cronbach's alpha values above 0.7 and Composite Reliability values over 0.5. These findings indicate that the measurement items had good internal consistency and convergent validity.

Table 1 Reliability and Convergent Validity

Construct			Cronbach's Alpha	Composite Reliability	AVE
Venture Capital Effective Management Practices			0.791	0.857	0.545
Return on Assets			0.757	0.845	0.579
Venture Capital Financial Management Practices			0.757	0.846	0.580
Return on Equity			0.771	0.840	0.521

The findings show that all constructs had acceptable reliability and validity levels, thus the measurement model was suitable for the estimation of the structural model. Fornell-Larcker criterion was used to evaluate the discriminant validity. The square roots of the AVE for each construct were higher than the inter-construct correlations, suggesting that each construct measured a different concept. The measurement model thus showed good discriminant validity and was therefore deemed appropriate to test the hypotheses.

Table 2 Discriminant Validity (Fornell–Larcker Criterion)

Construct	1	2	3	4
1. VCEMP	0.738			
2. ROA	0.810	0.761		
3. VCFMP			0.761	
4. ROE			0.725	0.722

The Average Variance Extracted (AVE) square roots are represented by the diagonal values.

In general, the reliability and validity data showed that the constructs had good psychometric properties and were suitable for structural model analysis.

Structural Model Assessment

After the adequacy of the measurement model was confirmed, the structural model was assessed through bootstrapping in SmartPLS 4 to investigate the relationship between venture capital management practices and performance of digital payment technology startups. Standardised path coefficients (β), t-statistics and p-values were used to assess the structural model.

Hypothesis One

H₀₁: Venture Capital Effective Management Practices have no significant effect on the Return on Assets (ROA) of digital payment technology startups.

The findings show that there is a strong positive relationship between Venture Capital Effective Management Practices and Return on Assets ($\beta = 0.810$, $t = 21.092$, $p < 0.001$). The high t-statistic and statistically significant p-value suggest that effective management practices have a significant impact on financial performance and asset utilisation. Thus, the null hypothesis is rejected, and the alternative hypothesis is accepted.

Hypothesis Two

H₀₂: Venture Capital Financial Management Practices have no significant effect on the Return on Equity (ROE) of digital payment technology startups.

Likewise, Venture Capital Financial Management Practices had positive and statistically significant correlation with Return on Equity ($\beta = 0.745$, $t = 14.838$, $p < 0.001$). The results suggest that judicious budgeting, financial control and effective utilisation of venture capital investments can greatly improve the shareholder returns. Hence, the null hypothesis is rejected in favour of the alternative hypothesis.

Table 3 Structural Model Results

Hypothesis	Relationship	β	t-value	p-value	Decision
H1	VCEMP → ROA	0.810	21.092	<0.001	Supported
H2	VCFMP → ROE	0.745	14.838	<0.001	Supported

The model structure shows that all the dimensions of VC management practices have a significant positive impact on the financial performance of digital payment technology startups. The effect of venture capital effective management practices was stronger ($\beta = 0.810$) than the effect of venture capital financial management practices ($\beta = 0.745$), indicating that strategic planning, governance, monitoring, and managerial oversight has a greater influence on improving the performance of startups than financial management practices alone. However, the results suggest that both dimensions are complementary, supporting the hypothesis that digital payment technology startups gain more performance benefits if they have sound strategic management complemented by sound financial management.

Discussion of Findings

The study investigated the effect of venture capital management practices on digital payment technology startups in Nigeria, while considering the overall effect of innovation capital funding on the performance of digital payment technology startups in Nigeria. The results are empirical evidence of the fact that the effective management practices of VC and the financial management practices of VC have a significant positive impact on the financial performance of startups (Return on Assets (ROA) of the startup and the Return on Equity (ROE) of the startup, respectively). The results show that the value of innovation capital is not only in its access to finance, but also on the management skills that are used in planning, monitoring and using the venture capital resources. The results support the view that while financial resources may be a prerequisite for a high level of organisational performance, they are not sufficient unless there is effective management.

The first key finding is that the practice of effective management of a VC has a significant positive effect on the Return on Assets (ROA). The positive and significant path coefficient indicates that digital payment technology startups with effective governance, strategic planning, continuous monitoring and good managerial decision making, are more efficient in utilising organizational assets than startups with weak management. The results lend support to the main thesis of Dynamic Capabilities Theory, that is, that the performance of an organisation depends not only on its access to strategic resources but on its ability to integrate, deploy and continuously reconfigure them to respond to shifting business environments (Teece et al., 1997; Teece, 2007). While VC funding offers digital payment tech startups the capital they need to grow and innovate, the results suggest that better asset utilization is tied to effective VC management practices, such as strategic planning, governance, monitoring investments, and making decisions. These agile management skills can help startups convert innovation capital into better operational efficiencies and improved financial results.

The result is in line with the study conducted by Chemmanur, Krishnan and Nandy (2022), which revealed that the venture-backed firms with better governance structures and strategic management systems performed better on innovation and organisational growth than the firms with weak managerial oversight. In the same way, Croce, Martí, and Murtinu (2024) found that the best results of VC investment for entrepreneurial success occur when the VC and the entrepreneur are involved in strategic planning and governance. The present study builds on these findings and shows the positive relationship between good

VC management and better operational efficiency within the Nigerian digital payment technology sector as evidenced by high ROA.

The second finding is that financial management practices of Venture Capital (VC) firms have a significant impact on the Return on Equity (ROE). From this finding, it can be concluded that with careful budgeting, expenditure control, cash-flow management and financial accountability, startups with venture capital investment could make better use of the money invested by the shareholders and achieve better financial returns. In the highly competitive digital payment sector, where companies must keep investing in technology, regulatory compliance, and customer acquisition, disciplined financial management seems like a must to stay profitable while fostering innovation.

This observation is in line with the study of Adomako, Danso and Ofori Damoah (2023) which found that firms with better financial management skills had better profitability and organisational growth, as efficient use of resources led to effective investments. Similarly, Brigham and Ehrhardt (2022) state that good financial management enhances the performance of an organisation through the reinforcement of budgeting systems, investment evaluation and financial control mechanisms. The results of the current study thus support the notion that VC is effective in meeting its goals only when accompanied by sound financial management that can convert external investment into a viable financial return.

One interesting finding of this study is that the practices of venture capital effective management had a greater impact on startups' performance than the practices of venture capital financial management. Both dimensions were statistically significant, however the higher path coefficient for 'effective management' indicates that strategic governance and managerial capability has a greater influence on improving organisational performance than financial control. The discovery suggests that although sound financial management is essential, start-ups benefit from VC funding when financial discipline is combined with strategic planning, organizational leadership, and decision making. For this reason, managerial ability is seen as the link between the financial resources and the organisational outcomes.

The results support Dynamic Capabilities Theory which suggests that the essence of competitive advantage lies in the ability of an organisation to deploy, adapt and reconfigure its resources and capabilities in a way that is effective to meet the changing market requirements (Teece et al., 1997; Teece, 2007). This implies that although global innovation capital funding is essential for the growth of startups, its impact on the performance of startups depends on the quality of VCs management practices. Well-planned, well-governed, well-monitored, and well-invested startups are more likely to make the most of their assets, turning external capital into better financial results.

The findings have policy implications that are critical for the enhancement of the digital entrepreneurship ecosystem in Nigeria. Government agencies, innovation hubs, VCs and DFI should accompany financial investment with managerial support programmes to enhance governance, strategic planning, financial management and organisational capacity of digital payment technology startups. These interventions can have a positive impact on the effectiveness of the use of innovation capital, leading to higher survival rates of startups, greater investor trust, and overall national goals on digital transformation, financial inclusion, and economic diversification.

Overall, the study shows that besides access to innovation capital funding from around the world, the quality of VCs' management practices is also a key determinant of sustainable performance in digital payment technology startups. Companies that are able to secure sufficient innovation capital and manage their business and finances well have a greater chance of realising better operational efficiency, higher financial benefits, and a competitive advantage that can be maintained.

Conclusion

This study investigated the impact of venture capital management practices on the overall performance of digital payment technology startups in Nigeria in the context of the global innovation capital funding. The results confirm that the venture capital management practices play an important role in improving the performance of start-ups, as measured by Return on Assets (ROA) and Return on Equity (ROE). In particular, the study identified that the effects of the VC effective management practices on the organisational performance were higher compared to the VC financial management practices, which indicated that the strategic governance, planning, monitoring and managerial capability was more essential in increasing the value of the innovation capital.

The study builds on the existing body of knowledge related to entrepreneurial finance by providing evidence that access to VC funding is not enough to ensure high performance in startups. Instead, the performance gains of global innovation capital investment rely on the management of investment resources inside entrepreneurial firms. The results lend support to the main thesis of Dynamic Capabilities Theory, that is, that the performance of an organisation depends not only on its access to strategic resources but on its ability to integrate, deploy and continuously reconfigure them to respond to shifting business environments (Teece et al., 1997; Teece, 2007). While VC funding offers digital payment tech startups the capital they need to grow and innovate, the results suggest that better asset utilization is tied to effective VC management practices, such as strategic planning, governance, monitoring investments, and making decisions. These agile management skills can help startups convert innovation capital into better operational efficiencies and improved financial results.

The study also helps augment the existing literature on digital entrepreneurship in emerging economies with empirical evidence from the fast-growing digital payment technology industry in Nigeria. As the role of fintech in driving financial inclusion and digital transformation grows, the impact of venture capital management practices on organizational performance is significant and can be relevant to entrepreneurs, investors, policymakers and development institutions aiming to enhance innovation ecosystems. Overall, the study finds that sustainable startup performance is not simply a function of innovation capital, but a function of the strategic and disciplined allocation of resources that are backed by startups.

Practical and Policy implications

The results have significant implications for entrepreneurs, venture capitalist companies, policy makers and institutions that support entrepreneurship development. The study underscores the importance of establishing robust governance structures, planning, tracking performance, and managing finances, alongside VC funding, for startup founders and management teams. These management skills help to optimize the use of investment resources and to boost financial results.

The findings indicate that for VC firms, it is not enough to just invest money, they should also provide post-investment support by mentoring, sitting on the board, coaching managers, and giving strategic advice. These value added activities will have a positive impact on the performance of the portfolio and the returns on investment.

Policy-wise, government institutions and innovation support institutions should boost entrepreneurship development programmes by combining managerial capacity building with financial support programmes. Adopting policies to foster better corporate governance training, financial management education, accelerator programmes and innovation advisory services can boost the success of venture capital investment and increase startup survival and competitiveness. These interventions would be a key

enabler to the agenda of the digital economy in Nigeria, which involves strengthening fintech innovation, financial inclusion and sustainable economic development.

Limitations and Suggestions for Future Research.

This study has some limitations, however. The study used a cross-sectional research design, which only allows for the study of relationships between variables at one specific moment in time, and thus does not allow for long-term causal inferences. Longitudinal designs could be used in future studies to investigate the association between various venture capital management practices and the performance of startups at various stages of their development.

Secondly, the study concentrated on digital payment technology startups in Nigeria alone. The results are therefore not necessarily applicable to other types of fintech companies or technology startups in different institutional and economic settings. Inter-industry and/or inter-country comparisons would yield more insights into the context of venture capital management and startup performance.

Finally, the study analysed the performance of the startups with the help of Return on Assets (ROA) and Return on Equity (ROE). These are good indicators of financial performance, but future studies could expand on this to include other dimensions, including innovation capability, customer growth, market expansion, operational efficiency and sustainability outcomes to better understand startup performance in the digital economy.

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