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Article

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Building resilience and sustainability in small businesses enterprises through sustainable venture capital investment in sub-Saharan Africa

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ABSTRACT

Venture capital (VC) has the potential to revolutionize sustainability in small and medium enterprises (SMEs), yet this area remains underexplored in sustainable finance. This study explores the role of VC in fostering resilience and sustainability within SMEs in sub-Saharan Africa, highlighting the need for increased sustainable financing to address regional challenges and promote resilient business models. While sustainable financing is crucial for promoting sustainable practices, small businesses face barriers in accessing funding opportunities to strengthen resilience. Through explanatory factor analysis (EFA) of data from 61 VC firms across three sub-Saharan African countries from 2015 to 2021, the study reveals that combining VC investments, resilience, sustainability practices, enhanced business performance, market share expansion and introducing new products and services leads to sustainable growth for SMEs. This has practical implications for investors, policymakers, and business owners seeking to elevate sustainability practices as well as enhance business performance through strategic VC financing. Furthermore, the study presents a framework for sustainable VC finance, stressing its role in driving sustainable growth and market expansion in small enterprises. This contributes to the literature by deepening understanding of the relationship between VC finance, resilience, sustainability, and business performance. Thus far, the varying levels of economic development and sectoral disparities across sub-Saharan Africa may impact the scalability and effectiveness of sustainability practices driven by VC. These contextual challenges raise concerns about the equitable distribution of VC benefits and the depth of their impact on small business resilience and sustainability ecosystems.

IMPACT STATEMENT

This study unveils the transformative power of venture capital (VC) in driving sustainable growth and resilience within small and medium enterprises (SMEs) in sub-Saharan Africa. Our analysis of data from 61 VC firms reveals how strategic VC financing can unlock sustainable business models, enhancing resilience, market share, and innovation while addressing regional challenges. This research offers a critical roadmap for investors, policymakers, and business owners to leverage VC for sustainable development, contributing vital insights to the field of sustainable finance and promoting equitable access to capital for a more resilient and sustainable business ecosystem in sub-Saharan Africa.

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and Small Business
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Business Management;
Sustainable Development;
Sustainability

1. Introduction

Small and medium enterprises (SMEs) are integral to the global economy, driving employment, innovation and economic growth. The shift towards sustainability is no longer optional but imperative for SMEs to excel in today's evolving business landscape (Babajide et al., 2020; Cumming et al., 2021; Dhayal et al., 2023; Gibson, 2024; Macchiavello & Siri, 2022). Embracing sustainability not only reduces operational costs and attracts eco-conscious consumers but also ensures long-term success in a world valuing sustainable practices (Ferri & Acosta, 2019; Neumeyer & Santos, 2018; Oyewole et al., 2024). SMEs lead the way in pioneering disruptive sustainable business models and cutting-edge technologies. However, these firms face

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significant barriers in securing funding through conventional channels due to stringent requirements, limited collateral or high-risk profiles (Álvarez et al., 2019; Bonini & Capizzi, 2019; Kato et al., 2024). Sustainable financing empowers SMEs to invest in green technologies, enhance efficiency and meet environmental standards, fostering innovation and positive impacts (Du and Cai, 2020; Oprisan et al., 2023; Maiti, 2022; Zhao et al., 2021). This transition, supported by sustainable venture capital (VC) financing, is crucial for SMEs to remain competitive, grow sustainably and thrive in a future centered on sustainability. Despite the widespread discourse on sustainability across various development sectors, business owners are not consistently inclined to incorporate sustainability into their daily operations.

Many contend that advocating for natural resource conservation alone is insufficient to advance sustainability effectively, particularly in regions like Africa, where future economic growth and profitability take precedence (Bell & Stellingwerf, 2012). As a result, entrepreneurs may prioritize profit maximization and market share expansion over sustainability, perceiving direct returns as limited, which hinders the adoption of sustainable practices (Bour et al., 2024; Kato & Chiloane-Phetla, 2021). Supporting the earlier declarations, recent studies conducted (e.g. Berg, 2019; Gibson et al. 2021; Klein et al. 2023; Mason et al., 2016) have shown that sustainable finance plays a pivotal role in reducing greenhouse gas emissions, fostering sustainable growth, and catalyzing innovation within SMEs. This emerging body of literature highlights the critical importance of nurturing sustainable financing options for SMEs, particularly in the East African context, and advocates for future initiatives in this domain. The interdependence between sustainable finance and SME sustainability underscores the potential for significant environmental stewardship and the cultivation of a sustainable economic landscape through conscientious financial practices (Vianelli, 2021). Amidst the ongoing discourse on the transformative impact of sustainable finance on business resilience and environmental sustainability, there has been a noticeable upsurge in interest in this field. Several researchers have delved into innovative strategies to explore how early-stage enterprises funded by VC can enhance the sustainable progression of promising ventures (Álvarez Jaramillo et al., 2019; Svetek, 2022).

In the dynamic business landscape, VC plays a pivotal role in driving innovation and nurturing resilient ventures, particularly in establishing sustainable businesses, fostering entrepreneurship development and promoting sustainable growth in sub-Saharan Africa. These ventures aim not only to generate profits but also to create a positive societal and environmental impact (Bocken, 2015; Bour et al., 2024; Dhayal et al., 2023; Schaltegger & Wagner, 2011). Babajide et al. (2020) discovered that financial stability positively influences entrepreneurship by facilitating credit allocation and supporting new business ventures. VC can significantly increase SMEs' potential for technological innovation, profitability, and expansion, according to research by Du and Cai (2020). In contrast, a recent study by Zhao et al. (2021) highlighted how VC influences growth constraints and sustainability across different business stages, revealing that early-stage businesses encounter more financial limitations than mature-stage counterparts, with VC proving more effective in addressing these constraints for growth-stage enterprises. Moreover, the study indicates that VC has a greater impact on mature-stage firms' sustainable expansion capacity than early-stage businesses, especially benefiting state-owned entities. Although this sounds fantastic, it is unclear what part VC finance plays in the sub-Saharan region, especially in Uganda. Hence research that addresses the connection between sustainable finance and sustainability in business enterprises is not only critical but also urgent in the current global context.

Additionally, while prior studies have extensively explored sustainable finance models such as green bonds, climate finance and microfinance in fostering sustainable development (Aassouli & Ahmed, 2023; Bulevska, 2014; Hua et al., 2023; Ferri & Acosta, 2019; Macchiavello & Siri, 2022; Soto-Acosta et al., 2016; Vianelli, 2021), there remains a significant gap in understanding there remains a crucial knowledge gap about the potential of VC financing in cultivating sustainable business ecosystems. (Buchner et al., 2014; Cumming et al., 2021; Muhairi & Nobanee, 2019; Sahu & Panda, 2024; Sartzetakis, 2021). The current literature lacks sufficient exploration of SMEs' resilience and their ability to adapt sustainably. This study seeks to fill the existing knowledge gap in this field by introducing a sustainable finance model. The model has the potential to benefit emerging economies in sub-Saharan Africa by supporting the transition towards zero carbon emissions, a critical challenge for SMEs aiming to reconcile resource limitations with sustainability to improve profitability (Sartzetakis, 2021).

Furthermore, efforts by government bodies and sustainability advocates to tackle carbon emissions and promote sustainability have been noticeable in recent times (Sartzetakis, 2021; Schaltegger &

Wagner, 2011; Van den Heuvel & Popp, 2023). However, the specific impact of sustainable VC finance in this area remains uncertain, revealing a significant gap in the literature concerning its role in enhancing resilience and sustainability amidst mounting environmental challenges. Besides, sub-Saharan countries face significant threats to the environment, such as pollution, resource depletion and climate change (Hartzmark & Sussman, 2019; Prasad et al., 2022; Sartzetakis, 2021). Similarly, Lyu and Chen (2022) study examined the interplay between founder control, equity financing, corporate radical strategy, and corporate success in listed firms from 2010 to 2019. While they discovered that equity financing mediates the founder control-performance relationship, the study was limited to China's listed companies and did not delve into environmental sustainability, particularly in the context of smaller businesses. Such concentration on China's listed firms overlooks the significance of SMEs. Therefore, our research aims to bridge these gaps by exploring how VC investments, particularly in sub-Saharan Africa, can enhance the resilience and sustainability of SMEs, shedding light on an area overlooked in the existing literature. Thus, it is fundamental to place the SME sector at the forefront of transforming conventional business models to align with sustainability principles (Kumar et al., 2022). Despite their critical role in the circular economy, SMEs still face barriers to accessing finance options (Davydova et al., 2020). Thus, our study aims to explore solutions to support the resilience and sustainability practices of SMEs in sub-Saharan Africa through sustainable investment strategies, with a focus on South Africa, Kenya and Uganda.

Prior researchers have approached VC financing from various angles. Some researchers have delved into how VCs make financial decisions regarding high-return ventures and their stake in funded companies (Gompers et al., 2020; Vazirani & Bhattacharjee, 2024). Others have explored the role of VC finance in boosting innovation (Hirukawa & Ueda, 2011; Kortum & Lerner, 2001; Lerner & Nanda, 2020; Peneder, 2010). The role of VC in fostering high-impact entrepreneurship and economic growth has also been studied (Ahmad et al., 2018; Kato & Ge, 2023; Sipola et al., 2023). Whereas several works analyzed the impact of equity financing on early-stage firms' success and survival (Block et al., 2024; Kato & Chiloane-Tsoka, 2022; Svetek, 2022; Zhang et al., 2023). Glücksman (2020) investigated the Swedish entrepreneurial experiences in mitigating issues arising from information asymmetry between VC investors and entrepreneurs. While the above-mentioned studies offer valuable insights into VC finance, they do not extensively address the essential role of sustainable financing in establishing resilient and sustainable businesses. While some existing research underscores its significance in sustainable development (Aassouli & Ahmed, 2023; Ferri & Acosta, 2019; Hua et al., 2023; Macchiavello & Siri, 2022; Soto-Acosta et al., 2016), there is a clear gap in understanding how VC stimulates entrepreneurial resilience and sustainability practices in small enterprises (Sahu & Panda, 2024). There is insufficient exploration in the current literature particularly on SMEs' entrepreneurial resilience and capacity for sustainable adaptation. Bridging this knowledge gap is essential to leverage the potential of VC funding in SMEs to drive sustainable growth, support sustainability efforts, and advance inclusive development in regions such as South Africa, Kenya and Uganda.

In contrast, critics argue that relying solely on VC finance is insufficient for driving genuine environmental sustainability (Bellavitis et al., 2017; Lerner & Nanda, 2020; Svetek, 2022; Tykvová, 2018). They stress that a narrow focus on financial metrics may neglect the larger systemic changes needed in business practices and regulations. Addressing structural issues and advocating for stronger environmental policies are vital for creating an environment that is conducive to sustainable businesses. The triple bottom line (TBL) model, evaluating a company's performance based on profit, people and the planet, is increasingly adopted by businesses to improve operational excellence and value chain (Bocken, 2015; Slaper & Hall, 2011; Soto-Acosta et al., 2016). This approach attracts customers, achieves long-term financial stability and fosters transparency and accountability by disclosing environmental, social and governance performance. Oprisan et al. (2023) highlight the importance of sustainable finance in promoting transparency and accountability for companies, particularly small businesses, by requiring them to disclose their ESG performance. This article seeks to enhance the current knowledge base by highlighting the distinct impact of sustainable finance on small businesses in the area.

The study contributes to the literature by shedding light on the transformative impact of integrating VC investments, resilience strategies and sustainable practices in SMEs. This research unveils how this integration leads to improved business performance, expansion of market share and the introduction of innovative products and services, ultimately propelling sustainable growth and positioning businesses for long-term success in sub-Saharan Africa. Additionally, the introduction of a pioneering sustainable VC

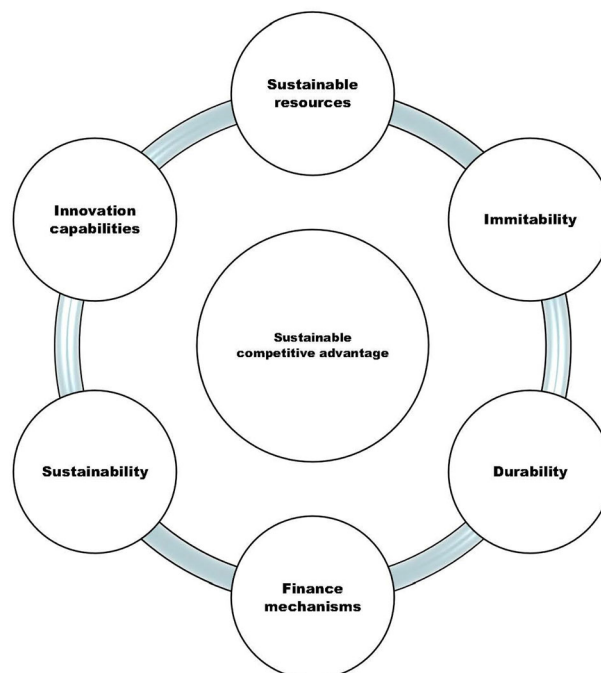
finance model provides stakeholders with a framework to develop impactful strategies, empowering businesses to adopt sustainability practices, fortify their resilience against external challenges and pave the way for enhanced sustainability and prosperity in the region.

The article comprises six sections, namely: (i) theoretical and empirical discussion on resilience and sustainable business models; (ii) materials and methods detailing research methodology; (iii) data collection instruments, and analysis framework; (iv) results emphasizing an explanatory factor analysis (EFA) of sustainable finance and VC's impact on SMEs' resilience towards sustainability, discussion on study contributions and limitations, proposed sustainable VC finance framework for enhancing SMEs' resilience and sustainability practices, and future research directions.

2. Theoretical review: resource-based view (RBV) theory

The resource-based view (RBV) theory plays a crucial role in understanding a firm's performance and growth, particularly concerning VC financing and the transition to sustainability for small firms. This theory emphasizes that a firm's success is significantly influenced by the resources it possesses, including financial, human capital and innovative resources (Barney, 1991; Penrose, 1959). In the realm of sustainable financing, the RBV theory demonstrates how leveraging these resources strategically can enhance the resilience and sustainability of SMEs (Temba et al., 2023). Small firms often face constraints in financial resources, human capital and innovation capacity, making the application of the RBV theory essential in guiding them toward sustainable growth. Thus, our objective is to underline the profound significance of the RBV theory in the context of sustainable VC financing and its profound implications for SMEs transitioning towards sustainability principles to cultivate consumer ecological consciousness and deliver substantial value in a fiercely competitive business environment. Emphasizing the competitive advantage of VC-backed firms over non-VC-backed companies in terms of superior resources is the concern for this study. This examination illuminates how the strategic utilization of sustainable VC investments can enable businesses to stand out through eco-conscious initiatives, driving innovation and setting them apart in a rapidly evolving and competitive market landscape.

The conceptual framework (Figure 1) rooted in the RBV theory of the firm, elucidates the interplay of sustainable resources, imitability, durability, finance mechanisms, sustainability and innovation capabilities



Authors compilation; 2024

Figure 1. Conceptual Framework for Sustainable Complete Advance.

in fostering sustainability within small firms. VC's role in this framework lies in enhancing the firm's resource base and capabilities, aligning with RBV's emphasis on leveraging unique and valuable resources for sustained competitive advantage. By injecting financial resources, strategic guidance, and networks, VC facilitates the acquisition of sustainable resources, fosters innovation capabilities and strengthens the long-term viability of small firms. This alignment between VC and RBV theory underscores how strategic resource allocation and sustainable practices can be reinforced to drive resilience and competitiveness in small firms while promoting sustainability in line with RBV's principles of resource heterogeneity and sustained advantage.

In light of this, it is essential to illuminate how previous scholars have articulated sustainability principles with sustainable finance. Certain scholars position social issues at the core of sustainability discussions, contending that all sustainability domains are inherently social. These encompass ecological, economic, political and cultural facets of sustainability. Similarly, the economic aspect of sustainability is subject to varying interpretations. While some view development within sustainable development as synonymous with economic growth, others stress the inherent trade-offs between environmental preservation and the fulfillment of essential welfare objectives such as food, water, health and shelter (Bulevska, 2014). This nuanced perspective highlights the complexities surrounding economic sustainability within the larger framework of sustainability principles. In conclusion, we align with the prevailing discourse among scholars regarding the interplay between environmental and economic dimensions of sustainability, often deliberated through the concepts of weak and strong sustainability (Pearce & Atkinson, 1993).

3. Literature review and hypothesis development

3.1. Resilience and sustainable venture capital

In this section, the study delves into the foundational concepts supporting sustainable VC finance practices, investigating how PVC firms are increasingly emphasizing small companies demonstrating a robust dedication to environmental sustainability throughout the due diligence process. Building upon these concepts, the development of hypotheses paves the way for empirically analyzing the correlation between sustainable finance strategies and the sustainability of small enterprises within the region. While various sustainable finance approaches exist, the study narrows its focus primarily on VC capital financing as a key mechanism for fostering sustainability and resilience in small firms.

VC's untapped potential to drive sustainability initiatives in small businesses begs for in-depth exploration and strategic integration into the financial landscape of entrepreneurial ventures. Many scholars (e.g. Krämer-Eis et al., 2021; Mansouri & Momtaz, 2022; Van den Heuvel & Popp, 2023) argue that VC funding enables SMEs to access the necessary resources to navigate economic and market challenges, thus aiding them to adapt to changing conditions and withstand setbacks. Not only do VC firms provide capital, but they also bring expertise, mentorship and access to professional networks, which are essential for the growth and success of SMEs (Amornsiripanitch et al., 2019). This unique combination of financial support and strategic guidance contributes to the entrepreneurial resilience of these businesses. Recent studies highlight a crucial aspect of VC's role in SMEs' sustainable growth, namely its ability to foster resilience, enabling SMEs to sustain their operations, recover effectively and continue their growth trajectory, thus contributing to long-term sustainability (Aldianto et al., 2021; Chirambo, 2017; Gunasekaran et al., 2011).

In 2021, Block et al. (2024) conducted two extensive surveys involving 479 VC's and 215 PE fund managers. The study revealed a growing trend among private equity and VC firms to factor climate resilience into their investment portfolios. Ethical obligations, stakeholder expectations, product distinctiveness and portfolio performance drive this shift. The study emphasizes the implications for policymakers and sustainable finance proponents in the finance sector. A recent research study by Corner et al. (2017) investigated the impact of entrepreneurs' venture failure on their emotional and psychological well-being. Qualitative findings from 11 entrepreneurs who received VC funding revealed resilience as a pivotal factor enabling them to re-enter entrepreneurship. Psychologists highlighted the entrepreneurs' endurance in business operations despite experiencing failure as a challenging ordeal (Corner et al., 2017; Lafuente et al., 2019). Nasser (2021) consistently employed a survey to investigate 308 managers at Iraq's Southern Oil Company and identified entrepreneurial resilience as an interacting variable.

Furthermore, the author determined that VCs play a crucial role in promoting long-term entrepreneurial orientation as well as creating entrepreneurial resilience through collaboration. These findings highlight the critical role that VC investments play in building resilient and profitable organizations.

Consequently, there is a call to enhance current research by incorporating fresh perspectives on sustainability practices, a central theme of this study. Ultimately, this approach aims to explore the synergy between practices influenced by VC finance. The discussion inspires us to explore the first hypothesis regarding entrepreneurial resilience and SMEs' access to VC investment.

Hypothesis (H1): *Small business enterprises that receive VC investment will exhibit higher levels of resilience and embrace sustainable practices.*

3.2. Sustainability, innovation and venture capital

In the past 30 years, extensive research has focused on sustainability-related topics. Initially, studies primarily concentrated on environmental sustainability. However, research in this area has progressed, encompassing a broader spectrum of sustainability aspects beyond solely environmental concerns (Antarciuc et al., 2018; Bocken, 2015). The emergence of sustainable finance and green investments has significantly strengthened sustainability principles, particularly within SMEs (Maiti, 2022). In entrepreneurial finance, sustainability and innovation have gained paramount importance, underscoring the increasing focus on responsible and forward-thinking corporate practices (Amel-Zadeh & Serafeim, 2018; Botsari & Lang, 2020). The increasing demand for a holistic approach that considers aspects of social equity, resilience and sustainability has sparked a significant change in the business landscape. Entrepreneurs are increasingly addressing societal and environmental challenges while striving to enhance their business operations (Bell & Stellingwerf, 2012; Slaper & Hall, 2011). This shift involves a heightened focus on community development and working conditions, emphasizing the importance of a positive work environment, organizational learning, and social consciousness (Schaltegger & Wagner, 2011; Soto-Acosta et al., 2016). While the concept appears to be appealing, comprehensive literature supporting this subject is at best scant. This study aims to partially address the existing gaps in the literature, thus contributing valuable insights towards understanding this field.

Recent studies highlight an increasing focus by VCs to enhance environmental sustainability practices within their portfolio of companies (Daugaard, 2020; Dhayal et al., 2023; Manigart & Khosravi, 2024). VC finance, and impact investment, target startups at the forefront of developing eco-friendly technologies, thus making the investment landscape both innovative and impactful (Pantea & Tkacik, 2024). Such practices not only demonstrate a commitment to sustainability but also serve as key drivers for fostering sustainability within SMEs, promoting responsible business practices, and addressing environmental challenges effectively. VC is a type of private equity investment that focuses on financing and supporting high-potential early-stage or growth-stage enterprises to achieve significant returns on investment (Svetek, 2022; Tykvová, 2018; Zhang et al., 2023). Recent research asserts that VC plays an important role in strengthening small businesses' resilience and assisting their transition to sustainability through the TBL principles (Agbloyor et al., 2023; Antarciuc et al., 2018). Venture capitalists often invest in creative, scalable enterprises with strong growth potential. Moreover, they provide key mentorship, innovation, and board management in addition to financial resources, all of which are critical for the long-term success and expansion of high-growth businesses (Gompers et al., 2020; Lerner, 2010). As a result, urgent investigations are necessary to advance the understanding of sustainability and drive advancement in this discipline.

The impact of environmental legislation on the growth of institutional VC and governmental (GVC) investments in cleantech companies operating in 21 OECD nations is the subject of a recent study by Bianchini and Croce (2022). The findings revealed that IVC investments in cleantech are primarily influenced by the level of environmental taxes and market pull mechanisms like feed-in tariffs and R&D subsidies, whereas GVC investment decisions are influenced by a nation's commitment to meeting environmental targets because GVC funds are designed as a substitute for direct government incentives. This suggests that there is a substitution effect between the two types of intervention when direct government incentives are less developed. In light of this, expanding the creative SMEs' access to

sustainable VC funding would be a practical strategy to help these businesses adopt sustainable practices and support sustainable development goals.

SMEs are urged to integrate ESG principles into financial decision-making processes to secure competitiveness in a dynamic business landscape. This shift aligns with an evolving business ethos that emphasizes sustainable practices for long-term success and positive societal impact (Pantea & Tkacik, 2024). Encouraging small firms to embrace sustainability initiatives serves as a conduit for addressing poverty, fostering job creation, and driving economic prosperity in the region, reflecting a growing commitment towards sustainable development and social responsibility (e.g. Cumming et al., 2021; Mansouri & Momtaz, 2022; Schaltegger & Wagner, 2011; Siefkes et al., 2023). Despite notable progress in advanced economies, there remains a gap in supporting SMEs' transition to sustainable development. This gap is attributed to underdeveloped financial markets and insufficient investor and government engagement in driving sustainability initiatives within small businesses. This research seeks to provide valuable insights and recommendations to bridge the existing gap and foster a more sustainable business environment for SMEs.

While acknowledging the valuable efforts of previous scholars in this field, it is worth noting that the concept of sustainable finance, which is essential for integrating ESG principles (Driessen, 2021; Eccles et al., 2017; Schoenmaker & Schramade, 2018), is still emerging in sub-Saharan Africa. This region is facing challenges such as increasing carbon emissions, insufficient waste management, and pollution of the environment (i.e. air, water and soil). Collaborative efforts between the government and environmental organizations aim to address these challenges, with a particular focus on empowering small business enterprises. However, the inadequacy of sustainable finance resources and limited awareness about sustainable business practices pose significant barriers to fostering inclusive development within the startup ecosystem (Álvarez Jaramillo et al., 2019; Chien et al., 2021; Cheung et al., 2022). Ultimately, these factors contribute to hindering progress toward resilience and sustainability in the SME sector.

Results of (e.g. Krämer-Eis et al., 2021; Lerner & Nanda, 2020) underscore VC's role in driving innovation, a critical component in the transition to sustainability practices by small business firms. VCs seek businesses with disruptive ideas that address environmental and social challenges, thus accelerating the adoption of sustainable business models (Caldera et al., 2019). Similarly, Cumming et al. (2021) narrate that VC investors are central to providing crucial financial resources, expertise, and strategic guidance to SMEs. Some studies have uncovered how sustainable finance fosters an environment of innovation by supporting disruptive ideas and nurturing entrepreneurial talent (Hirukawa & Ueda, 2011; Peneder, 2010; Schaltegger & Wagner, 2011; Vianelli, 2021). The active involvement of VCs goes beyond financial investment; they provide mentorship, industry connections and valuable insights, assisting SMEs to enhance their competitiveness and seize market opportunities. Nevertheless, studies focusing on sub-Saharan Africa are still needed to enhance our knowledge in the arena of sustainable business growth. In contrast, research suggests that sub-Saharan countries still lack conducive policies for the widespread adoption of sustainable finance. Nevertheless, offers a fresh perspective on the challenges encountered and opportunities available for fostering environmental and social responsibility within the financial sector. The preceding discussion lays a solid groundwork for examining the second hypothesis, which posits the interaction among sustainability, innovation and VC in SMEs striving to transition to sustainable growth through sustainable investment.

Hypothesis (H2): *VC facilitates the implementation of sustainability practices and innovative activities in small businesses, leading to heightened entrepreneurial resilience.*

3.3 Venture capital and sustainable business performance

Research in the field of sustainability has experienced a surge in the past decade, driven by the growing awareness of global warming and its impacts. There has been an increased focus on education and awareness regarding energy consumption, climate science, sustainable investments and the business implications of environmental and social sustainability. The urgent environmental challenges and the looming threat of climate change have reached a critical level of risk that cannot be ignored. Concerns have risen about the potential cascading effects on global natural systems and societies (Prasad et al., 2022). As

demand grows for emerging economies to shift towards zero carbon emissions, SMEs face challenges due to resource scarcity (Biekpe, 2004; Lestari & Wiryono, 2023). Therefore, SMEs need to adopt sustainability practices to foster sustainable economies in their respective nations. Research indicates a positive influence of sustainable finance in transforming business models and promoting environmental sustainability. This research is crucial in defining the concept of sustainability and developing metrics to measure progress towards sustainability objectives.

In a recent study, Lyu and Chen (2022) investigated the correlation between founder control, equity financing, corporate radical strategy and corporate success. Utilizing data from listed firms between 2010 and 2019, they evaluated the positive effects on business growth and performance. While the study covered various aspects, our primary focus is on exploring how equity financing influences a company's growth and performance. According to the study, there is a stronger mediating influence of equity financing on the relationship between founder control and corporate performance. Although this study offers insightful information about equity finance, it did not adequately address the crucial topic of environmental sustainability. Furthermore, it focused mostly on China's listed corporations, paying less attention to small and medium-sized businesses. Thus, our study provides a chance to fill in these important gaps in the literature by highlighting how VC investments, particularly in sub-Saharan Africa, can help SMEs become more resilient and sustainable.

According to research by Du and Cai (2020), VC can greatly enhance SMEs' capacity for technological innovation, profitability and growth. VC can significantly increase SMEs' potential for technological innovation, profitability and expansion, according to research by Du and Cai (2020). Although this sounds fantastic, it is unclear what part VC finance plays in the sub-Saharan region, especially in Uganda. Consequently, any programs meant to facilitate access to VC, are imperative to support business ventures for economic expansion and promote the growth of small and medium-sized enterprises.

Zhao et al.'s study from 2021 consistently showed differences in how venture VC affected growth restrictions and sustainability at various business levels. First, they assert that growth-stage businesses experience more financial restrictions than mature-stage businesses do, and that VC is a better means of relieving growth-stage businesses of their financing constraints than mature-stage businesses are. The underlying assumption here is that VC has a far greater impact on firms in their mature stages concerning their capacity for sustainable expansion than it does on enterprises in their growing stages. Additionally, VC appears to have a greater impact on state-owned mature-stage businesses when it comes to improving their capacity for sustainable expansion than it does on non-state-owned growth-stage businesses.

A study by Soto-Acosta et al. (2016) study found that sustainable finance models significantly impact small business performance, contributing nearly 50% to people and profit dimensions. However, this study did not explore VC's catalytic role in promoting sustainable practices. These results emphasize the essential role of sustainable finance in enhancing the social and economic performance of small businesses, a concept supported by Hua et al. (2023). However, the study falls short of recognizing VC's catalytic impact on sustainability. Therefore, our research seeks to address these existing gaps in the field of VC. Bell and Stellingwerf emphasize the significance of prioritizing people in sustainable business ventures. The authors stress the need for trust-based and mutual dealings, where sustainable entrepreneurs prove responsibility, and accountability, and actively prevent exploitation of all parties involved in the business environment.

A thorough review of relevant literature indicates an increasing awareness of VC and its role in sustainable development investments. This raises questions about the extent to which VC influences businesses and the importance of its contribution to informed decision-making for investors and stakeholders. Additionally, VC plays a crucial role in protecting user and customer privacy by mitigating cyber-attacks (Al-Sartawi, 2020). It is essential to study the impact of VC on financial reporting (Türegün, 2019). VC enables investors to gather, analyze, and interpret a wealth of information, including ESG risks and opportunities for the relevant portfolios. Aligned with ESG principles, this approach integrates economic, social and environmental considerations, driving long-term success and advancing overall economic prosperity through balanced outcomes. Drawing from the literature that supports the connection between VC and sustainable business performance, we are driven to formulate the third hypothesis.

Hypothesis (H3): *VC funding has the potential to enhance the innovation capabilities of small business enterprises, enabling them to introduce new sustainable products and services to the market.*

4. Materials and methods

4.1. Research design

The study adopted a mixed-methods approach, combining quantitative and qualitative methods, and utilizing primary data collected from private VC (PVC) firms in Southern and East African countries. The inclusion of cross-country data from South Africa, Kenya, and Uganda in this study enhances its strength by capturing diverse perspectives and practices across multiple regions, thus increasing the generalization and robustness of the findings. This study stands out for its utilization of EFA, a departure from the methods employed by earlier scholars. While Tykvová (2018) and Kato (2021) relied on systematic reviews, Lerner and Nanda (2020) utilized a mixed-method approach, these studies overlooked the essential components of resilience and sustainability, which this research seeks to address. In contrast, Lestari et al. (2024) conducted a confirmatory analysis. Not only does using an EFA approach break new ground, but it also sheds light on how VC can drive resilience and promote sustainability practices in small businesses, offering a unique perspective on the relationship between VC financing and sustainability practices.

Based on cross-country data, Bocken (2015) asserts that some countries exhibit greater success than others in effectively allocating limited resources to resilient and sustainable business enterprises. This highlights the diverse regulatory policy environments across nations. The study suggests that the combination of VC investment, knowledge transfer, and market expansion influences the resilience, sustainability, and growth of new products and services in small businesses, thus enhancing their long-term viability in a competitive market. Despite these attempts, theoretical and empirical researchers have given limited attention to this topic.

4.2. Data and sample

The data collection method for this study involved distributing online survey questionnaires to a sample of 257 PVC firms across South Africa, Kenya and Uganda, aiming to capture their annual sustainability performance and metrics from 2015 to 2021. In conducting this cross-country study, a strategic approach combining both stratified and purposive sampling techniques was utilized to select participants. The study specifically targeted PVC firms with a successful track record spanning 5–10 years, particularly those emphasizing early-stage growth enterprises. To maintain focus, the research scope excluded portfolio companies and angel investors from participation. To strengthen the results, the study complemented the data analysis with semi-structured interviews conducted with representatives from 12 key PVC firms operating in the study nations. These firms were selected based on their demonstrated expertise, operational effectiveness, and established presence in the respective countries.

This comprehensive approach garnered insights into the dynamics and trends within the VC landscape across these regions. Despite initial challenges, including 38% of email deliveries failing due to invalid accounts and 11% citing security concerns, the response rate was commendable. Out of 123 respondents overseeing 327 VC-funded enterprises, 61 responses were received, achieving a favorable 51% response rate. This rate ensures adequate representation within the research sample to draw reliable conclusions. Notably, the response rate exceeded typical figures for online surveys, surpassing the challenges reported in previous literature by Klassen et al. (2012), which attributed low response rates to factors such as busyness (25%), invalid email addresses (14%), unavailability (12%) and restrictions on anonymous participation due to company policies (22%).

The primary source of data for this study was collected from reputable organizations such as The Southern Africa Venture Capital and Private Equity Association (SAVCA), South African Revenue Services (SARS) and African Venture Capital Association (AfVCA). These professional organizations specialize in collecting information on PVC firms' performance, ensuring the credibility and reliability of the datasets utilized. This triangulation of data from diverse and reliable sources not only enriched the depth of the study findings but also added credibility to the research outcomes. Drawing parallels with VC research practices in the United States, which often rely on data from organizations like the National VC Association (NVCA), this approach stands out for providing trustworthy and validated data compared to commercial databases (Gompers & Lerner, 2000).

Table 1. Variables and measurements.

Variable	Definition	Measurement
<i>Outcome variables</i>		
Resilience	The capacity of SMEs to withstand and recover from disruptions	Quantitative scale assessing response to disruptions
Sustainability	SMEs' ability to operate in an environmentally friendly and socially responsible manner while remaining economically viable	Composite index combining environmental, social, and economic factors
<i>Explanatory variables</i>		
VC financing	Extent of VC funding focusing on sustainable initiatives	Percentage of total sustainability practices within the VC-funded firm
Government policy	Availability of government support, and policy frameworks for enhancing sustainability practices	Rating scale based on access to green financing options, government incentives, and sustainable business practices
Growth stage	Categorization of SMEs based on their growth stage (e.g. early-stage, growth-phase, established)	Nominal scale categorizing SMEs by growth stage
<i>Control variables</i>		
Company size	Size classification of SMEs (small, medium, large)	Ordinal scale based on annual turnover or employee count
Industry sector	Categorization of SMEs based on industry sectors	Nominal scale indicating the sector of operation
Geographical Location	Consideration of SMEs' locations (urban, rural, specific regions)	Nominal scale identifying the geographical area

Authors Compilation; 2023.

The EFA technique as illustrated in Table 1 above, was employed to condense data into variables with significant factor loadings, thus contributing to the sustainable finance model. The first variable, VC Investment, delves into the amount and timing of funding received by these businesses, providing insights into the financial support they acquire. Sustainability practices form a crucial variable, shedding light on the adoption of sustainable business strategies, environmental initiatives and social responsibility efforts by recipient enterprises. Innovation activities represent the introduction of novel products, services or processes, showcasing the entrepreneurial creativity and forward-thinking mindset fostered by VC funding. Lastly, resilience levels capture the ability of these businesses to navigate challenges, adapt to market fluctuations and remain sustainable in the face of adversity.

Through the EFA model, we measured the latent factor loadings of variables such as VC investments, sustainability practices, innovation activities, and resilience levels, uncovered underlying patterns and assessed their influence on the success and longevity of SMEs in fostering resilience and sustainability. As highlighted by Lestari et al. (2024), EFA enhances data reliability and validity by uncovering latent factors, providing a comprehensive understanding of the data structure beyond what traditional regression models offer.

While descriptive statistics and regression models focus on measuring data significance and normality, EFA delves deeper into existing underlying relationships among variables. In a nutshell, EFA assisted in identifying the key components that contribute to building resilience and driving sustainable practices, offering a nuanced understanding of how VC influences these critical aspects of small enterprise development.

For qualitative data collection, the researcher conducted semi-structured interviews with 12 key VC players to supplement quantitative data. Participants were selected using hybrid structured interviews and purposive sampling. Saturation was used to determine the interview direction since the data reflected the theory's constructs. Saturation occurs when the theory's full range of constructs is fully reflected in the data, especially when the researcher repeatedly hears the same comments (Starks and Brown Trinidad, 2007). Verbatim transcription was used to ensure rich narratives.

4.5. Ethical consideration and participant's consent

The study received approval from the University of South Africa and participants provided written informed consent before voluntarily completing the survey, with the option to withdraw at any time without consequences.

5. Results

5.1. Descriptive statistics

The data include descriptive statistics for variables related to the research topic, with kurtosis values indicating the degree of peakedness or flatness of the distribution. Normality is typically set at -2 and 2 , with values greater than 2 indicating leptokurtic behavior and values below -2 indicating platykurtic behavior.

As shown in Table 2, the study examined various aspects of business, such as new market ideas, government policies, VC finance, supportive regulatory policies, start-up effective growth, financial and business advice, financial liberations, innovative financing instruments and good leadership. These variables demonstrate kurtosis values within the range of -2 and 2 , indicating potential normal distributions. The normality test results confirm the normal distribution of the data, allowing for hypothesis testing using parametric models to assess the interaction of predictor variables on dependent variables.

Nevertheless, there are a few variables that exhibit notable departures from normality, as evident from their kurtosis values which surpass the threshold. Outliers and variables with significant deviations from normality include financial impediments (1.2691), inconsistencies in global financial mechanisms (0.8049), lack of support for green market bonds (1.0544), limited awareness of environmental sustainability (1.0544) and an increase in waste production and pollution in SMEs (1.5671). Thus, recognizing the abundance of variables and the need to streamline their dimensionality to gain insights into the fundamental structure of VC financing in sustainable small business enterprises, we conducted an EFA.

5.2. Explanatory factor analysis

The primary objective of using EFA was to uncover the underlying latent factors and observed patterns within the descriptive statistics derived from the LimeSurvey questionnaires (Lestari et al., 2024). The pattern matrix was derived from principal component analysis with Promax rotation and Kaiser normalization to identify latent factors contributing to observed patterns in the dataset. This approach also enabled data reduction by condensing information from multiple variables into a smaller set of components. Precisely, this approach facilitated the identification of factor loadings for variables on these

Table 2. Descriptive statistics.

	N	Mean		Std. Deviation	Kurtosis	
		Statistic	Std. Error		Statistic	Std. Error
New market ideas	151	4.253	0.0596	0.7320	2.178	0.392
Government policy	151	3.893	0.0781	0.9602	0.233	0.392
VC finance	151	4.060	0.0729	0.8961	0.642	0.392
Knowledge transfer	151	3.820	0.0809	0.9938	-0.024	0.392
Supportive regulatory policies	151	4.107	0.0679	0.8338	1.662	0.392
VC-geographical and sector disparities	151	3.793	0.0878	1.0789	0.040	0.392
Start-up effective growth	151	4.113	0.0854	1.0490	1.196	0.392
New parts and services in mkt	151	3.047	0.0878	1.0791	-0.430	0.392
Mitigate financial impediments	151	2.947	0.1033	1.2691	-1.115	0.392
Innovation capabilities	151	3.093	0.0903	1.1096	-0.476	0.392
Enhanced start-up success rates	151	3.353	0.0857	1.0528	-0.354	0.392
Financial and business advice	151	4.267	0.0642	0.7888	1.861	0.392
Uncontrolled financial environment	151	2.807	0.0961	1.1815	-0.780	0.392
Financial liberations	151	4.173	0.0669	0.8226	2.222	0.392
Integrated financing approaches	151	3.813	0.0858	1.0544	0.229	0.392
Good leadership	151	4.173	0.0669	0.8226	2.222	0.392
Economic growth	151	3.467	0.1287	1.5818	1.959	0.392
Inconsistencies in global financial mechanisms	151	4.213	0.0655	0.8049	2.568	0.392
Lack of support for green market bonds	151	3.813	0.0858	1.0544	0.229	0.392
Environmental sustainability awareness scarce	151	3.813	0.0858	1.0544	0.229	0.392
SMEs' Increasing waste production and pollution	151	3.413	0.1275	1.5671	2.386	0.392
Adequate techno support to SMEs	151	4.173	0.0669	0.8226	2.222	0.392
Collaborative policies desired	151	4.213	0.0606	0.7446	1.747	0.392
Innovative financing instruments	151	4.253	0.0596	0.7320	2.178	0.392
Valid N (listwise)	151					

Source: Primary data (2023).

Table 3. Pattern matrix.

Factor loadings	Component				
	VC investment	Sustainability practices	sustainable growth	Entrepreneurial resilience	Economic growth
VC finance	0.866				
Knowledge transfer	0.777				
Startup effective growth	0.354				
Government policy		0.903			
VC-geographical and sector disparities		0.959			
Integrated financing approaches		0.968			
Economic growth		0.906			
Lack of support for green market Bonds		0.968			
Environmental sustainability awareness scarce		0.968			
SMEs' waste production and pollution		0.93			
Supportive regulatory policies			0.911		
Good leadership			0.928		
Inconsistencies in global financial mechanisms			1.027		
Adequate techno support to SMEs			0.928		
New market Ideas				0.963	
Financial and + B'ss advice				0.531	
Collaborative policies desired				0.969	
Innovative financing instruments				0.963	
Mitigate financial impediments					0.854
Innovation capabilities					0.844
Enhanced startup success rates					0.555
Uncontrolled financial environment					0.711
Extraction method: principal component analysis					
Rotation method: promax with Kaiser normalization					
a Rotation converged in 7 iterations					

Source: Primary data (2023) Sta.

components, revealing significant associations with the underlying patterns in the data. Subsequently, these findings informed the selection of variables for hypothesis testing.

As shown in the pattern matrix analysis (Table 3), these results demonstrate the connections between various variables and the components that were identified using principal component analysis. The pattern matrix analysis provides insights into how these components contribute to the building of resilience and promotion of sustainability within SMEs through VC financing. Subsequently, results based on the EFA factor loading to each group component and their implications are analyzed below. Next, I discuss the individual pattern matrix components and their interrelationship with VC as a tool for sustainable finance in small business enterprises.

5.2.1. Venture capital investment

Three key factors – VC finance, knowledge transfer and effective start-up growth – have a significant impact on how VC finance fosters sustainable growth in small businesses. The factor loading value for VC finance stands at 0.866, emphasizing its pivotal role in advancing sustainable growth in small enterprises. This underscores the vital role of VC financing in providing essential financial support, guidance, and networking prospects that empower small businesses to scale, innovate and sustain long-term growth while embracing sustainable principles.

Moreover, the factor loading value for knowledge transfer of 0.777 conveys the importance of transferring valuable knowledge and expertise from VC investors to small businesses. This knowledge exchange can enhance the business acumen and strategic decision-making of small enterprises, increasing their resilience through informed business practices. In contrast, the factor loading value for start-up effective growth (0.354) has a lesser loading figure matched to the latter loadings. Still, it plays a role in promoting SMEs' sustainable growth strategies driven by VC finance, enabling start-ups to optimize their operations, establish market presence, and scale their businesses sustainably.

5.2.2. Sustainability practices

Government policies are crucial for instilling sustainability practices in small businesses, with a high factor loading of 0.903 indicating the significant role government policies play in supporting regulations. Similarly, the loading of 0.959 for VC geographical and sector disparities highlights challenges faced by

small businesses when undertaking sustainable practices (Liu & Jiang, 2019). Tailored sustainability strategies and targeted policies can address these disparities, encouraging sustainable practices bolstering business resilience across various sectors and locations, and promoting long-term environmental sustainability and social responsibility.

Furthermore, the factor loading of 0.968 for integrated financing approaches underscores their role in advancing sustainability in small businesses. Innovative financial strategies, as indicated by a high factor loading of 0.906 for economic growth, enhance economic development by intertwining sustainability practices with financial strategies. This integration not only supports environmental conservation but also spurs economic progress and adds value to small businesses in the long term.

The factor loading of 0.968 for the lack of support for green market bonds suggests that the scarcity of these financial instruments in the market, which ultimately inhibit small businesses' adoption of sustainable financing options. Increasing the availability of green financial instruments can promote investments in sustainable practices, thus enhancing resilience and sustainability. Similarly, the high factor loading of 0.968 for environmental sustainability awareness deficiency points to the lack of green finance adoption among small businesses. Recent research (e.g. Sadiq et al., 2022; Surmanidze et al., 2023; Volz, 2018). highlights the growing need for increased green finance to assist SMEs in aligning with the mandates of the United Nations Framework Convention on Climate Change (UNFCCC) convention.

Additionally, the factor loading of 0.930 suggests that small firms lacking access to sustainable finance, especially VC investment, exhibit challenges such as poor waste management, non-green production and pollution. This underscores the importance of implementing tailored measures to improve waste management, enhance resource efficiency, and mitigate pollution, thus creating a sustainable operational framework for SMEs to boost their sustainability practices.

5.2.3. Sustainable growth

Supportive Regulatory policies (0.911): This factor loading implies that supportive regulatory policies are essential for fostering sustainable growth in small business enterprises. Regulations that incentivize sustainability practices and provide a supportive framework can drive growth outcomes while ensuring environmental and social responsibility. The Good leadership loading factor of 0.92 highlights the critical role of good leadership in nurturing sustainable growth within small businesses. Effective leadership that prioritizes sustainability, innovation and long-term strategic planning can guide businesses toward sustainable practices and growth underscores the importance of providing adequate technological support to SMEs for sustainable growth.

In contrast, a factor loading of 1.027 for Inconsistencies in global financial mechanisms which exceeds one indicates potential overlap or redundancy in the data analysis; this requires further investigation for clarity. In the context of sustainable growth, addressing inconsistencies in global financial mechanisms is crucial for fostering stability, transparency and equitable access to financing for small businesses on a global scale.

5.2.4. Entrepreneurial resilience

The high factor loadings relating to entrepreneurial resilience including New Market Ideas (0.963), Collaborative Policies (0.969), and Innovative Financing Instruments (0.963) substantially contribute to entrepreneurial resilience and sustainability. This high factor loadings on entrepreneurial resilience convey a significant correlation. While desired collaborative policies promote partnerships and innovation that assist in integrating VC investment with sustainability practices to achieve long-term viability and positive societal impact, it can be concluded that these policies substantially contribute to enhancing the entrepreneurial resilience of small businesses to transition to sustainable practices. Financial & Business Advice (0.531) conveyed average factor loading matched to the latter variables, thus indicating that, on average, VC investors provide financial support and moderate advice that contribute to the small business enterprises' decision-making processes. Hence, by aligning financial support with sustainable initiatives, small businesses can achieve long-term viability and positive societal impact.

5.3. Semi-structured interview results

The interview results obtained from the 12 key respondents indicate favorable outcomes regarding SMEs' efforts to shift towards sustainability practices. All 12 respondents show advancements in adopting sustainability principles; however, resource constraints and knowledge gaps emerge as significant hurdles. Our findings align with the advocacy of previous scholars who highlighted the importance for VC investors to integrate sustainability principles into their funding decisions, particularly during the due diligence process of potential high-growth firms (HGFs) seeking funding. Furthermore, our research adds to the existing knowledge base by underlining the necessity to mentor both staff and the business community on the advantages of embracing sustainability principles in a manner that promotes easy replication. This strategic approach resonates with the RBV theory, emphasizing the significance of superior skills and sustainable resource allocation, specifically through sustainable VC financing, to foster long-term competitiveness and sustainability within these enterprises. The findings underscore the necessity for enhancing sustainability awareness among small business entrepreneurs and emphasize the importance of government support for these initiatives. Given that VC investors face limited budgets, effective implementation of sustainability practices necessitates additional support from governmental entities to scale up these efforts successfully.

While the aforementioned findings are promising, it is noteworthy that 67.7% of the participants (8 out of 12) highlighted significant challenges stemming from the lack of supportive government policies. The VC industry in East Africa appears to lack defined investment strategies that encompass sustainability principles, unlike the advancements seen in South Africa. This hesitancy of government intervention in driving sustainable practices within the VC industry poses substantial obstacles to sustainable development. This echoes similar conclusions drawn in the prior study conducted by (Davydova et al., 2020). In light of these challenges, there is a pressing need for the government to establish clear policies and allocate direct funding to bolster this crucial initiative. Failing to address this issue hinders progress within the VC ecosystem of the region. Therefore, this study provides significant insights crucial for bolstering the resilience and sustainability initiatives of SMEs in sub-Saharan Africa using sustainable investment approaches, with a specific emphasis on South Africa, Kenya and Uganda.

6. Discussion

In this section, we link our debate with the specific hypotheses derived from the research questions. The results supporting or contrasting the research hypotheses, as well as evidence from the literature are highlighted. High factor loadings in a pattern matrix above 0.9 show a robust connection between the variables and the causal group component. If such loadings are recognized, it implies a clear and robust pattern in the data. However, if the loadings are lower, this may show variability and unreliable representation within the dataset. Next, we discuss how the results overlap with the hypothesis (H1, as indicated below).

6.1. Influence of VC on resilience and adoption of sustainability practices

Considering the high pattern matrix loading of *VC finance* (0.866) and *Knowledge transfer* (0.777), it is apparent that the sustainable VC finance model is recognized with distinguished support for sustainable growth, enhanced operational efficiency, resilience and ultimately the promotion of long-term sustainability of small business enterprises in South Africa, Kenya and Uganda. These results accentuate the crucial role VC finance and VCs' knowledge transfer play in promoting resilience and sustainability in small firms. The high factor loadings variables strengthen their substantial potential to sequentially improve the resilience of small firms and support sustainable growth strategies accountable for driving sustainability practices and inclusive growth in the sub-Saharan region. The results of this study align with previous research such as by Volz (2018), which highlighted the positive influence of VC on the entrepreneurial resilience and sustainability of small businesses. Furthermore, the interview results indicated a higher sustainability compliance aspect of VC-backed firms in South Africa and Kenya as opposed to Uganda. They demonstrated sustainable financing to small business enterprises'

consciousness of environmental threats to their operations. Earlier studies have delivered similar results (Antarciuc et al., 2018; Döll et al., 2022; Hua et al., 2023).

In the context of entrepreneurial resilience and sustainability practices within small businesses, a concerted effort from governments, VC investors, and international development partners is crucial to support firms aiming to embrace sustainability. This necessitates the establishment of robust financing mechanisms to enable the effective implementation of sustainable finance models. By doing so, small enterprises can actively contribute to ESG principles and uphold environmental benefits for the well-being of future generations.

Furthermore, we have also realized that government policies and supportive sustainability initiatives are essential for driving sustainability efforts in small firms. Factors loadings such as *Supportive regulatory policies* (0.911) and *Lack of support for green market Bonds* (0.968) indicate the important role regulatory frameworks play in promoting sustainable practices. Manigart and Khosravi (2024) postulate that there is a substantial need to uncover how VC investors establish sustainable funding mechanisms to facilitate their portfolio companies in transitioning towards embracing ESG and sustainability considerations, which are influenced by regulatory requirements and reporting obligations.

To further support this argument, our interview results revealed a gradual and concerted effort by the governments of South Africa and Kenya to regulate the VC industry, including promoting sustainable financing models. In Uganda, discussions are ongoing, particularly during the annual Private Equity and VC conferences organized by the Uganda Investment Authority. Despite government initiatives, nearly VC-backed firms seem to prioritize the TBL model, guided by VC investors and receiving peripheral support from international development partners. These outcomes align with *Hypothesis (H1)*, suggesting that small business enterprises receiving VC investment exhibit elevated levels of resilience and embrace sustainable practices. Furthermore, these findings correspond with some of the assertions highlighted in the literature review section. Bocken (2015) has confirmed that VCs provide financial support and essential TBL business advice and network support.

Suffice it to say that not all VC-backed firms achieve success despite the significant equity capital and business advice they receive from VC investors. As noted by Kato & Chiloane-Toska, 30% of these firms experience complete failure, 40% yield average returns and 30% achieve notable success with substantial returns that compensate for unsuccessful ventures. Key factors contributing to their prosperity include business model innovation, partnerships and a compelling business case. Conversely, factors leading to failure encompass challenges such as inadequate investor support, intense industry competition, and short-term investment perspectives. Therefore, it is imperative for early-stage firms to secure adequate equity capital and active involvement of VCs in their operations and are supported by government policies to bolster their resilience to external business challenges and embrace sustainable development models.

Therefore, scaling up government-supportive policy interventions in the financial markets is crucial to bolster sustainable finance tailored to SMEs, which are significant contributors to carbon emissions. Undoubtedly, through the implementation of sustainable financing mechanisms and supportive regulatory policies, small firms can enhance their sustainability practices, expand their market share and develop new products and services aligned with ESG goals.

6.2. The transformative role of VC in sustainability practices and greater entrepreneurial resilience

EFA results revealed that entrepreneurship resilience catalyzes sustainability initiatives by promoting innovation in eco-friendly products or services, exploring markets for sustainable solutions and driving operational efficiency to address carbon emissions and waste management challenges. Similar results were delivered by Hua et al. (2023). In addition, the development of sustainable products that mitigate environmental impact through new market ideas, along with financial and business advice, can guide businesses to adopt green practices, optimize resources and implement sustainable financial management. These findings align with the research objectives and are consistent with the study conducted by Keskin et al. (2013). The study highlights the close connection between these factors and the goals of the research. Furthermore, the study presents a close connection with the research objectives. Likewise,

collaboration policies can foster partnerships for waste reduction, pollution control, and shared sustainability goals, thus promoting collective environmental responsibility. Innovative Financing Instruments can enable investments in green technologies, waste management infrastructure, and pollution control measures, facilitating the integration of sustainable practices in day-to-day operations while addressing environmental challenges effectively.

While countries such as South Africa in the Southern region and Kenya in the Eastern region, have made strides in sustainability interventions, Uganda faces challenges despite the significant funding allocated by international development partners. Political dilemmas, excessive expenditures on consultations and conferences with limited impact, and unrealized donor funding into VC-backed firms hinder the transition of small businesses to sustainability practices advocated by climate finance initiatives under the Ministry of Finance in Uganda.

Besides, the component matrix revealed three additional critical characteristics that promote sustainable growth in small firms, namely: favorable regulatory policies, effective leadership, and adequate technology support. To begin with, since VC funding often goes hand in hand with knowledge sharing, mentorship, and access to industry expertise, it has been observed to facilitate small businesses to navigate challenges, make informed decisions and implement sustainable practices that drive growth. Supportive regulatory measures, with a factor loading value of 0.911, are critical for promoting long-term growth. These measures include incentives, rules, and recommendations for promoting environmental sustainability, fair competition and social responsibility. Therefore, it is believed that creating an enabling environment through good and supportive regulatory frameworks promotes the adoption of sustainable practices and assists in driving long-term growth.

EFA analysis results expose a strong connection between good leadership (0.928) and the key VC stakeholders, which is critical for driving long-term growth. Participant VC010 reported that *“Effective leadership fosters creativity, resilience, and long-term strategic planning.”* Considering this statement, SMEs’ management team, VC investors and government must prioritize sustainability, make ethically responsible decisions, and consider social and environmental considerations. These characteristics, along with the loading values from the pattern matrix analysis, contribute to a better understanding of the importance of supportive regulatory laws, effective leadership and technology support in promoting long-term success in small businesses. A critical evaluation of a body of work by uncovered gaps in understanding the nuanced relationship between VC investments and the long-term sustainability outcomes of small businesses (Bocken, 2015; Antarciuc et al., 2018; Döll et al., 2022).

This is important in the sense that advocates of entrepreneurial resilience and sustainability can benefit from these findings to create initiatives that promote sustainable growth and contribute to a more resilient economy. In a nutshell, the pattern matrix analysis highlights the intricate relationship between sustainable finance and VC in start-up ecosystems, providing valuable insights for stakeholders to support sustainable growth, entrepreneurship, and innovation, subsequently contributing to economic prosperity.

6.3. VC enhancement of innovation abilities and new sustainable products and services in SMEs

In this section, I debate the results identified to respond needing a deeper scrutiny. The results of New Market Ideas (0.963), suggest that VC-backed enterprises, benefiting from knowledge transfer from VCs, are well-positioned to introduce sustainable new products and services into the regional market. This, in turn, drives entrepreneurial innovation and resilience within small businesses, enabling them to adapt to evolving market dynamics and seize growth opportunities. Our study aligns with the findings of previous research (Dhayal et al., 2023), underscoring the significant role of the expertise of VC’s in fostering entrepreneurial resilience and guiding small enterprises toward sustainable business models. As mentioned earlier, small firms in Kenya and Uganda have shown progress towards a circular economy. However, their advancements still lag behind those of their European counterparts in the economic area. Firms embracing fresh concepts arising from sustainable VC allow them to stay relevant and competitive in evolving sustainable development landscapes, thus fostering long-term sustainability through proactive exploration of untapped markets and innovative approaches.

Hence, small business enterprises are funded through VC finance and are strengthened to remain agile and responsive to shifts in consumer preferences and industry trends so that they can effectively navigate challenges, diversify their offerings and position themselves for continued success in dynamic markets. In addition, prior theoretical and empirical evaluations indicate a gap in the literature. Lerner and Nanda (2020) asserts that certain countries excel in allocating limited resources to innovative and high-growth entrepreneurship, highlighting cross-national disparities in regulatory policy settings. The scarce attention given to sustainable HGFs and entrepreneurial resilience by academics is acknowledged, as noted by the OECD. We are convinced that these findings answer study *Hypothesis (H2): VC enables small businesses to implement sustainability practices and innovative activities resulting in greater entrepreneurial resilience.*

Integrating new market ideas not only fosters creativity but also nurtures a culture of innovation that propels small businesses toward sustained growth. The innovative models of SMEs can drive ongoing enhancements, fortify businesses against disruptions, and enhance their long-term sustainability and significance in the dynamic business environment. These findings echo the earlier research by Schick et al. (2002), which highlights the transformative impact of VC financing in facilitating the development of new products and services stemming from technological innovation, networking, market expansion and the expertise of VC investors.

Once adopted by small businesses, these sustainable models can drive sustainability practices that combat high carbon emissions, inadequate waste management and pollution in sub-Saharan Africa. VC funding not only boosts SMEs' market access, customer base, and partnerships, but it also enables them to expand operations sustainably. Earlier exploration by Neumeyer and Santos (2018) delivered parallel results accentuating sustainable finance as a catalyst for the sustainability landscape. This is premised on the notion that VC funds actively seek out enterprises with groundbreaking ideas, advanced technologies, and solutions addressing environmental and social challenges. Through investments in these ventures, VC's accelerate and promote the development of environmentally friendly products and services, and market expansion initiatives. In the final analysis, this fosters the establishment of sustainable value chains, and competitiveness and drives the sustainable growth and prosperity of SMEs. These results answer the third research *Hypothesis (H3): VC funding can enhance the innovation abilities of small business enterprises to deliver new sustainable products and services in the market.*

However, a debate arises on the feasibility and scalability of implementing sustainability practices in small businesses with limited resources and structural constraints in sub-Saharan Africa. While entrepreneurship resilience may drive initial efforts towards sustainable practices, the lack of regulatory support, financial constraints and infrastructural gaps pose challenges to the widespread adoption of sustainable initiatives.

Additionally, competing priorities, market pressures and economic uncertainties may divert focus from sustainability goals in favor of short-term gains, raising questions on the long-term sustainability of these practices in a region grappling with economic development and environmental concerns. The balancing act between entrepreneurship resilience and sustainability practices requires a nuanced approach that considers contextual factors, stakeholder collaboration and policy interventions to ensure meaningful and lasting environmental impact in small businesses across sub-Saharan Africa.

In summary, the concept of VC plays a crucial role in supporting the sustainable growth of SMEs. Through capital injections, strategic guidance, and access to networks, VC funding fosters resilience, promotes innovation, drives the adoption of sustainable practices and facilitates market expansion for SMEs and society at large.

7. Conclusion

VC investments have the potential to alter resilience and sustainability in small businesses, however, this sector is underexplored in sustainable finance. The goal of this study was to evaluate how VC influences the resilience and sustainability of small businesses in sub-Saharan Africa. To address regional sustainability concerns and establish resilient sustainable business models, the study used the EFA technique to assess research findings. The findings revealed high factor loadings of VC finance (0.866) and knowledge transfer (0.777) in the pattern matrix, confirming a distinct role for these factors in fostering sustainable

growth of small firms, including enhanced resilience strategies, and ultimately promoting the long-term sustainability of small business enterprises in South Africa, Kenya, and Uganda. These results suggest that sustainable VC financing must consider empowering small enterprises' resilience and transition to sustainability practices aligned with the TBL model.

The study corroborates earlier studies accentuating VC investments as a critical element in driving SMEs toward sustainability by not only delivering patient equity capital but also mentorship, innovation, market expansion, and strategic guidance (Bocken, 2015; Cumming et al., 2021; Dhayal et al., 2023). This financial support not only enhances the resilience of businesses to economic challenges but also facilitates the integration of sustainable practices into their operations, prioritizing environmental, social and governance considerations (Sahlman, 2022). The alignment of the Pattern Matrix with the research hypotheses underscores the significance of VC in fostering resilience and sustainability within SMEs, particularly in sub-Saharan Africa. The validation of key variables related to entrepreneurship resilience and sustainability practices underscores the core assumptions of the research, highlighting the innovative nature of the proposed sustainable finance model. These findings emphasize the crucial role of VC in driving positive change and fostering sustainable growth in small businesses across South Africa, Kenya and Uganda.

The study contributes significantly to the literature by revealing the transformative impact of integrating VC investments, resilience strategies and sustainable practices in SMEs. This integration leads to improved business performance, market share expansion, and innovation, driving sustainable growth in sub-Saharan Africa. Emphasizing the crucial role of sustainable VC finance in fostering resilient business models, the research offers a pioneering perspective for future strategies. The introduction of a sustainable VC finance model empowers stakeholders to develop impactful strategies, fostering sustainability practices, enhancing resilience and advancing sustainable prosperity in the region.

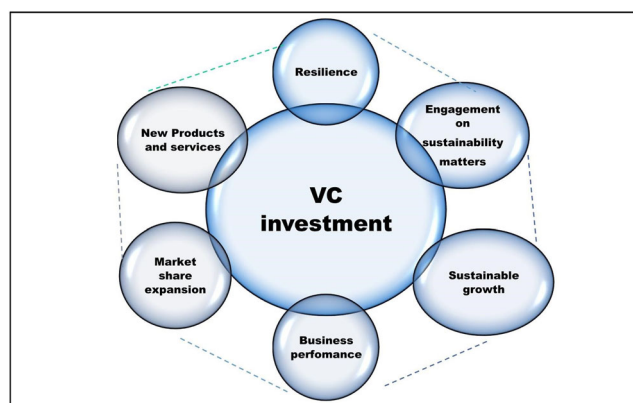
Despite positive findings, the study identified that insufficient mitigation strategies for financial obstacles (0.854), limited innovation capabilities (0.844) in small enterprises, an unstable financial environment in the VC industry (0.711) and economic uncertainties may shift attention from sustainability goals towards short-term profits. This raises concerns about the enduring sustainability of these practices in a region facing economic development and environmental challenges. Harmonizing entrepreneurship resilience and sustainability demands a nuanced approach to account for stakeholder engagement, and policy interventions to drive lasting environmental impact in small businesses throughout sub-Saharan Africa.

8. Theoretical contribution

The sustainable finance theoretical model highlights the role of VC in driving resilience, sustainability, sustainable growth, business performance, market share expansion and the development of new products and services. VC funding provides financial resources to support SMEs, enhancing their resilience and enabling them to effectively navigate economic, market and operational challenges. It also facilitates the prioritization of sustainability within SMEs, promoting sustainable practices, social responsibility and good governance. VC funding also improves SME performance by providing mentorship, strategic guidance, and promoting the adoption of ESG considerations (Sahu & Panda, 2024). This results in sustainable growth, long-term success, profitability and expansion, benefiting both SMEs and the broader economy and society.

The proposed sustainable VC finance model (Figure 2) illustrates intricate interconnections among variables, emphasizing the symbiotic relationship between VC investments, sustainability practices, entrepreneurship resilience and sustainable growth in SMEs delving into these connections uncovers a holistic view of how each element influences and reinforces the others, creating a synergistic ecosystem for sustainable business development (Neumeyer & Santos, 2018). We start with how VC investments influence each of the performance variables in sustainable finance models.

In the model, as illustrated in Figure 2, VC is positioned as a key predictor of value and resilience, with its interactions and dynamics influencing sustainability practices, sustainable growth, business performance, market expansion and development of new products and services within small business enterprises. The model underscores VC as a sustainable financing instrument capable of driving



Author's Compilation, (2024)

Figure 2. Proposed Sustainable Venture Capital Finance Model, (2024).

entrepreneurial resilience and sustainability among small businesses. Not only does VC serve as a financial catalyst (Dhayal et al., 2023), but it is also a strategic partner for small businesses, offering support, expertise, and guidance to enhance operational efficiency, innovation, and adaptability (Bocken, 2015). As a predictor of value and resilience, VC empowers businesses to prioritize sustainability practices by aligning resources with environmentally conscious initiatives, promoting resource efficiency, waste reduction and pollution control measures. Through the integration of sustainability into core operations and decision-making processes, small enterprises can foster long-term resilience, environmental responsibility and competitiveness in the market, propelling them towards sustainable growth and success.

Furthermore, the model highlights how VC's role extends beyond financial backing to nurturing innovative solutions and market expansion opportunities related to sustainable practices. By investing in new products and services that address societal needs and environmental challenges, VC facilitates the development of eco-friendly offerings, sustainable technologies and solutions that resonate with conscious consumers (Neumeyer & Santos, 2018). This holistic approach to financing aligns sustainability with business performance, market growth and resilient operations, setting the foundation for small businesses to thrive sustainably. In essence, the sustainable VC finance model underscores the transformative power of VC as a sustainable financing instrument that drives entrepreneurial resilience and sustainability within small business enterprises. Conventionally, it is recognized that the role of VC has positive impacts on the performance of start-ups through the contribution of equity capital and superior skills such as networks, management experience and innovation (Moore & Wüstenhagen, 2004).

Moreover, the sustainable finance model highlights how sustainable practices not only enhance the performance of SMEs but also pave the way for market share expansion and innovative product and service launches. Embracing sustainability drives business growth, improves competitiveness, and garners consumer loyalty. The sustainable growth achieved through VC investments, coupled with innovative strategies and market expansion, positions SMEs for

long-term success and profitability, underlining the critical role of resilience and sustainability in driving sustainable business practices and economic development (Gentzoglanis, 2022). This promotes sustainability by encouraging businesses to address societal challenges, incorporate sustainable technologies, and offer solutions that align with environmental and social needs.

The combination of VC investments, resilience, sustainability practices, improved business performance, market share expansion and the introduction of new products and services culminate in sustainable growth for SMEs. This model is strongly supported by other research works (Dhayal et al., 2023; Pradhan et al., 2020; Wöhler & Haase, 2022), emphasizing the crucial role of sustainable finance in fostering resilience and sustainable practices, particularly within small businesses. VC-backed enterprises have the potential to achieve sustainable long-term success, profitability, and growth while making valuable contributions to the economy and society. VC investments serve as the foundation, guiding SMEs toward sustainability through financial backing, mentorship and strategic direction. This infusion of capital not only enhances entrepreneurial resilience by preparing businesses to navigate economic challenges but also enables them to embed sustainable practices into their core operations. As SMEs prioritize TBL

principles through VC finance, they enhance their capacity to adapt and thrive in a dynamic market landscape.

Furthermore, in this study, it is observed that VC investments and businesses support sustainable growth and market share expansion. The effective leadership led by the VC investors plays a crucial role in driving market share expansion, and innovation and facilitating small businesses' launch of sustainable new products and services. The injection of capital from VCs enables small firms to scale their operations, penetrate new markets, innovate introduce environmentally friendly products to the market and differentiate themselves through sustainability initiatives.

Moreover, the focus on resilience and sustainability in small firms is paramount in navigating the competitive business landscape and ensuring long-term success. Any business attempts aimed at leveraging VC finance to expand market share and introduce sustainable products enable small businesses to enhance their agility, adaptability and competitiveness. Not only do such sustainable initiatives attract environmentally conscious consumers, but they also build brand loyalty and resilience in the face of economic uncertainties and market fluctuations. Consequently, the consensus among scholars is that VC finance catalyzes market growth and product innovation in small businesses, with a particular emphasis on sustainability and resilience. Their achieved competitive advantage assists them in driving growth and establishing themselves as leaders in resilience and sustainability within their respective industries.

8. Limitations and future research

While the study has shown positive results regarding the role of VC in fostering resilience and sustainability in small businesses in sub-Saharan Africa, challenges remain. Competing priorities, market pressures and economic uncertainties may divert focus from sustainability goals, raising questions about long-term sustainability. Achieving a balance between resilience and sustainability requires a nuanced approach that considers contextual collaboration among VC firms, policymakers, and local communities in driving sustainable change. As a result, research is needed to explore the specific mechanisms and effectiveness of different interventions that can create an enabling environment for small businesses to thrive sustainably in sub-Saharan Africa.

In sub-Saharan Africa, the complex economic landscape poses challenges for leveraging VC to promote sustainable business practices. Issues such as constrained access to funding, inadequate infrastructure, and regulatory intricacies may impede small businesses from adopting sustainability initiatives, despite the advantages of VC investments. Furthermore, disparities in economic development and sectoral differences across countries in the region can affect the scalability and efficacy of sustainability efforts driven by VC. These contextual hurdles raise questions about the equitable distribution of VC advantages and the extent of their influence on small business resilience and sustainability in the area.

Given that the study is centered on sustainable VC with a specific focus on South Africa, Kenya and Uganda, it is acknowledged that these findings may not be universally applicable to Southern and East Africa as a whole, considering the diverse economic landscapes and policy frameworks within the VC industry. Therefore, future research could expand the scope to include regions like West Africa, known for its substantial VC presence, to provide valuable insights for this study. Alternatively, to overcome these limitations, future research can enhance the depth and relevance of this research by expanding the sample size and conducting regional comparative analyses exploring policy implications and adopting innovation-driven strategies among small business enterprises in Africa. These steps are essential for leveraging VC to promote resilience and sustainability effectively.

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About the author

Dr. Ahmed I. Kato is a distinguished researcher dedicated to bridging the gap between knowledge and real-world solutions, particularly in the areas of venture capital, sustainable finance, women entrepreneurship, sustainable supply chain management, and sustainable entrepreneurship. He has a strong track record of rigorous research, evidenced by his publications in high-impact journals, and is committed to nurturing the next generation of researchers through his supervision of postgraduate students. His collaborative approach and over 16 years of experience managing finances for NGOs, including overseeing grants and managing contracts, particularly for UKaid and USAID funded programs, makes him a valuable asset in advancing entrepreneurship development and related fields.

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Data availability statement

The data availability is on request through the corresponding Author.

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