

The Digital Lifeline: A Systematic Review of Fintech's Role in Entrepreneurial Resilience

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Abstract: *This literature review explores the dynamic interplay between financial technology (Fintech) and the resilience of entrepreneurs. By employing a thematic analysis of contemporary research, this paper investigates how Fintech is not merely a technological advancement but an important partner in fostering entrepreneurial sustainability. Key findings reveal that Fintech enhances financial accessibility, streamlines operations, and provides crucial support during economic instability. The review underscores Fintech's multifaceted influence on financial performance, inclusivity, and the empowerment of micro, small, and medium enterprises (MSMEs). Ultimately, this paper argues that the integration of Fintech is essential for building a resilient and inclusive economic future for entrepreneurs.*

Keywords: Entrepreneur, Financial Technology, Fintech, Systematic Review, Sustainability

1. Introduction

Financial technology, commonly known as Fintech, represents the application of innovative technologies to revolutionize the delivery of financial services. This sector merges financial services with cutting-edge technology to enhance efficiency, accessibility, and user convenience. Fintech's scope is broad, covering everything from mobile banking and digital payments to peer-to-peer lending and crowdfunding (Arner, Barberis, & Buckley, 2015).

A primary contribution of Fintech has been its role in advancing financial inclusion and sustainability. By offering digital financial services, Fintech has extended banking and financial opportunities to previously underserved populations, such as those in remote regions or without access to traditional banking infrastructure (Moro-Visconti, Rambaud, & Pascual, 2020). Fintech solutions empower entrepreneurs by facilitating access to capital, providing financial management tools, and opening up new market opportunities. The unprecedented challenges posed by the COVID-19 pandemic have necessitated entrepreneurs to adapt and find sustainable solutions in navigating the evolving business landscape. The pandemic has also expedited the adoption of digital technologies, emphasizing the significance of resilience and adaptability for entrepreneurs who must be agile and innovative in responding to emerging trends and customer needs. This adaptability may involve diversifying product offerings, embracing e-commerce, or exploring new markets.

The intersection of fintech and entrepreneurs' sustainability has become an increasingly studied and intriguing subject for scholars globally. For instance, Arslan et al. (2021) discovered that fintech provides transactional security, convenience, and skill development opportunities for entrepreneurs at the base of the pyramid (BOP), thereby creating social value. This highlights the potential of fintech to promote sustainable entrepreneurship and inclusive economic growth. Another study focused on the small food business sector, examining the impact of fintech adoption on sustainability (Najib, Ermawati, & Fahma, 2021). The study proposed a comprehensive model of fintech peer-to-peer lending adoption by small food business owners, highlighting the potential of fintech to enhance the sustainability of small businesses and emphasizing the need for further research in this area. In China, a study found a U-shaped relationship between fintech and sustainable development (Deng, Huang, & Cheng, 2019). Analyzing peer-to-peer (P2P) lending data, the study revealed that fintech had both positive and negative effects on sustainable development. This suggests that while fintech solutions can provide opportunities for entrepreneurs, they may also pose challenges that need addressing sustainable development.

Dependence solely on these findings without limited support is insufficient. It is essential to systematically analyze and synthesize the empirical evidence from these studies to offer a comprehensive and structured perspective for future researchers. This process will also contribute to a deeper understanding of the existing patterns in the inter-relationship between fintech and the sustainability of entrepreneurs. The purpose of this systematic review is to assist in identifying gaps, formulating strategies for future research endeavors, and recognizing areas that require development.

2. Materials and Methods

2.1 The Review Protocol - ROSES

This research followed the review guidelines established by the Reporting Standards for Systematic Evidence Syntheses (ROSES). ROSES is specifically tailored for systematic reviews and maps in the field of environmental management, offering a refined approach that addresses the variability inherent in different review requirements (Haddaway et al., 2018).

2.2 Formulation of Research Questions

Establishing a comprehensive research question is pivotal in Systematic Literature Review (SLR). The research question guides article selection, data extraction, and reporting (Xiao & Watson, 2019). Formulation of the research questions employed a specific mnemonic (PICO; Lockwood et al., 2015). PICO, a tool for constructing research questions based on Population, phenomenon of Interest, and Context, is relevant to this study with Entrepreneurs (Population), the inter-relationship of fintech solutions (Phenomena of Interest), and Sustainability (Context). The research question formulated is: *“What is the inter-relationship between fintech solutions and the sustainability of entrepreneurs?”*

2.3 Systematic Searching Strategies

Systematic searching involves three primary phases: Identification, Screening, and Eligibility. Figure 1 illustrates these phases in a flow chart, adapted from Shaffril et al. (2019).

2.4 Identification

During the identification phase, the search for synonyms, related terms, and other terms associated with the study's major keywords—fintech, entrepreneurs, sustainability, and financial technology—occurs. Thesaurus online and keywords from prior studies were

employed to expand the primary keywords. Multiple databases, including Google Scholar as a supporting database, along with Scopus and Web of Science, were used to reduce retrieval bias (Durach, Kembro, & Wieland, 2017). Therefore, to discover relevant papers, Google Scholar, a supporting database, together with two major databases, Scopus and Web of Science were used.

The primary reliance on Scopus as the principal database is attributed to its designation as a comprehensive indexing database, encompassing millions of journals across multiple disciplines. Noteworthy strengths include quality control, full-text search capabilities, and advanced search string functionality (Gusenbauer & Haddaway, 2020; Sulaiman, Hassan, Shaffril, & Hanapi, 2023). Web of Science is equally recognized as a highly suitable academic search system due to its ability to meet essential performance criteria. Google Scholar, employed as a supporting database, offers several advantages. It provides a vast array of sources for review, with an abundance of documents in the fields of social sciences, as well as arts and humanities. Google Scholar's inclusivity extends to various publication types, including proceedings, books, theses, chapters in books, and unpublished materials, thereby broadening the scope of available resources (Gusenbauer & Haddaway, 2020).

The process of forming search strings in Scopus and Web of Science involved various techniques, such as field code functions, phrase searching, and the use of Boolean operators (OR and AND), truncation, and wild cards. In Google Scholar, the search technique employed keyword searching and Boolean operators (OR and AND). Additionally, a combination of terms like “fintech, financial technology, entrepreneurs, and sustainability” was used, if appropriate. In addition to advanced search methods, the authors utilized manual search approaches within the Google Scholar platform, including handpicking and snowballing. These methods complemented the electronic searches and ensured a comprehensive identification of relevant articles. The search for articles using databases occurred in September 2023. This comprehensive analysis identified a total of 39 pertinent articles across the three databases.

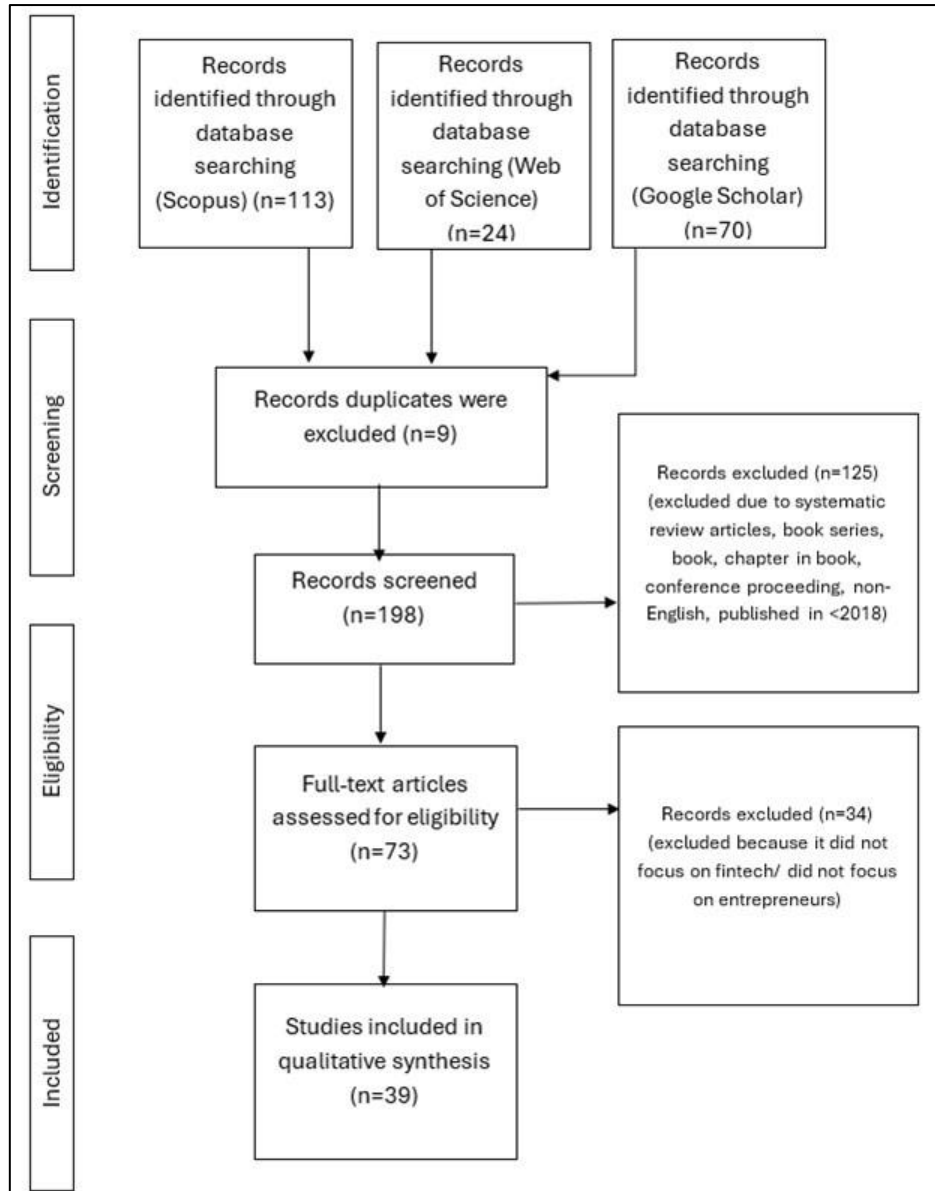


Figure 1: Literature Selection Process

2.5 Screening

The screening process was applied to the 207 articles identified during the identification phase. For articles from the Web of Science and Scopus databases, the screening process was automated using the 'limit to' feature. In contrast, for publications from the Google Scholar database, the screening process was semi-automated, given the limitation of the 'limit to' function to the year of publication alone.

The selection of articles was guided by predefined inclusion and exclusion criteria to ensure the relevance and quality of the studies reviewed. Current research adhered to the predefined study topic (Kitchenham & Charters, 2007), with selection criteria crucial in ensuring the relevance of chosen articles (Shaffril, Samah, Samsuddin, & Ali, 2019). Table 1 represents the selection criteria applied in this study.

A publication timeline from 2018 to 2023 was chosen, aligning with the principles of research maturity proposed by Kraus et al. (2020). This timeframe was deemed appropriate for including

enough publications in a systematic literature review, considering the study's primary goal of examining the inter-relationship between fintech solutions and entrepreneurs' sustainability.

Language selection was confined to English, following Okoli's recommendation (2015) to facilitate comprehensive language analysis. Articles were chosen based on their publication in indexed journals, ensuring high quality. After a thorough review, 207 articles were selected for further analysis.

Furthermore, these 207 articles were imported into the Mendeley reference manager program for enhanced organization and retrieval. Mendeley's 'related' tool and appropriate keywords, as employed by Alsolami and Embi (2018), facilitated the manual search procedure. During the eligibility phase, a total of 9 duplicate articles were detected and excluded by the Mendeley program. In total, 73 articles were identified for further analysis.

Table 1: Inclusion and exclusion criteria

Criterion	Inclusion	Exclusion
Literature type	Articles in Indexed journals	Articles in non-indexed journals
Language	English	Non-English
Timeline	Between 2018-2023	<2018

2.6 Eligibility

The eligibility phase involves a systematic evaluation of the article's suitability for inclusion in the study, accomplished by reviewing aspects such as the title, abstract, findings, and discussions. Thirty-four articles were excluded as they failed to meet the study's requirements. In total, 39 articles were selected for the next phase: data extraction and analysis.

2.7 Data Extraction and Analysis

The present study employed an integrative review methodology, encompassing qualitative, quantitative, and mixed-method studies as data sources (Okoli, 2015). The technique for extracting information from the chosen articles was based on the integration concept proposed by Whittemore and Knafl (2005).

Data extraction involved a comprehensive analysis of the abstracts, results, and findings of the 39 selected articles. Data were retrieved if they met predetermined criteria. Two primary criteria guided the selection of research studies for inclusion in the literature review. Firstly, the study must address the specific research questions identified. Secondly, the study should be directly relevant to the overall purpose of the investigation. Given the integrative review of mixed research designs, the thematic analysis technique, as suggested by Flemming et al. (2019), was deemed appropriate. Thematic analysis, according to Braun and Clarke (2006), aims to find, evaluate, and clarify themes and sub-themes derived from the gathered data. Initially, researchers identify and outline commonalities or connections among the extracted data to ascertain primary themes and sub-themes.

3. Results

3.1 Characteristics of the selected studies

This study analysed 39 selected articles, identifying five main themes through thematic analysis: fintech performance, fintech impact, fintech adoption, fintech funding, and model framework. Among the selected studies, five employed a mixed-method approach, twenty utilized the quantitative method, and fourteen adopted the qualitative method. Geographically,

thirteen studies were conducted in Brazil, three in Malaysia, two each in China and Spain, and the remainder spanned eight different locations, including Venezuela, Mexico, India, Bangladesh, Oman, Portugal, and Korea. In terms of publication years, two articles were published in 2006, two in 2010, one in 2011, three in 2012, one in 2015, one in 2017, three in 2018, and two in 2019.

3.2 The emerging themes (Areas of Research on Fintech)

Figure 2 shows the several emerging theme in the fintech field of study and the number of articles published in the respective themes. The themes are fintech performance, fintech impact, fintech adoption, fintech funding, and model framework. The distribution of research articles within these themes suggests varying levels of focus and interest within the academic and industry landscape.

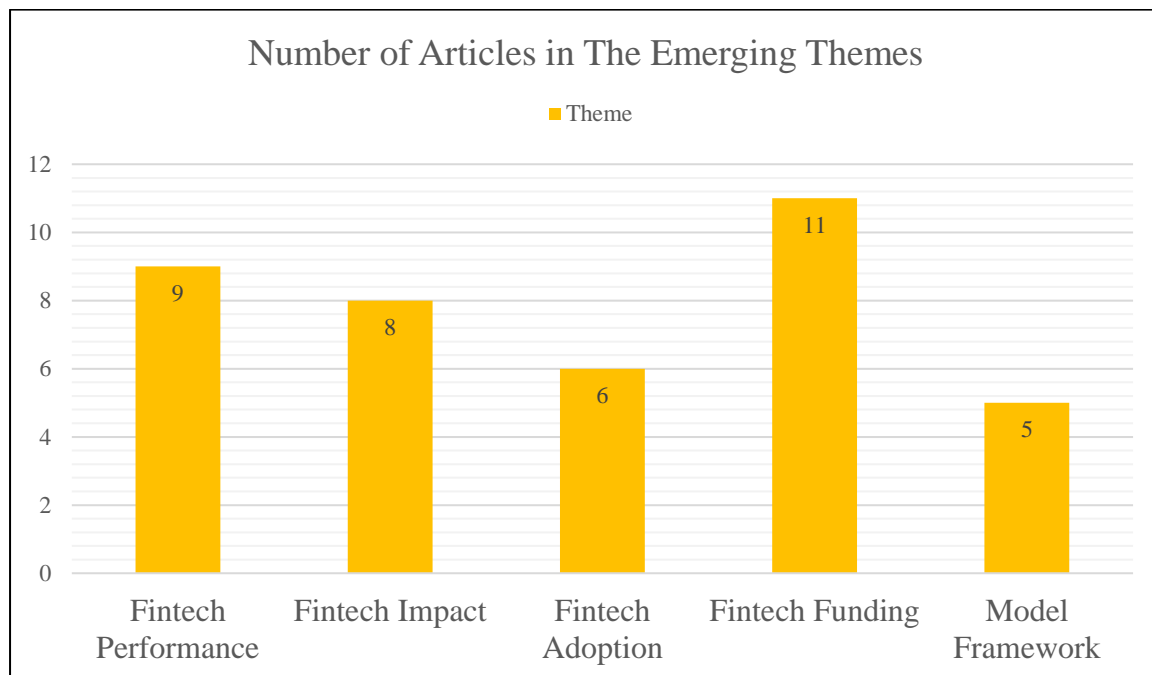


Figure 2: The Emerging Themes

3.3 Fintech Performance

The theme of Fintech performance highlights the tangible benefits received by MSMEs that embrace financial technology. Improved financial literacy and the adoption of Fintech tools are directly linked to enhanced business performance and long-term sustainability. The studies within this theme investigate fintech's impact on the performance of micro, small, and medium enterprises (MSMEs) (Widagdo & Sa'diyah, 2023; Gunawan, Jufrizen, & Pulungan, 2023; Siddik, Yong, & Rahman, 2023; Sabandar, 2019), fintech and non-fintech firms (Toumi, Najaf, Dhiaf, Li, & Kanagasabapathy, 2023), disadvantaged communities (Leong, Tan, Tan, & Faisal, 2022), fintech initiatives (Vergara & Agudo, 2021), fintech ecosystem (Avarmaa, Torkkeli, Laidroo, & Koroleva, 2022). These studies collectively emphasize the influence of fintech performance on business aspects, sustainability, societal empowerment, and environmental responsibility. Fintech performance not only benefits individual enterprises but also contributes to broader economic development and sustainable practices, making it a critical component in current financial landscapes.

3.4 Fintech Adoption

The Fintech adoption theme underscores the importance of creating a supportive ecosystem that encourages entrepreneurs to integrate Fintech into their operations. Adoption encompasses both businesses and consumers embracing these technologies for activities such as banking, investing, lending, and payments. The selected studies have explored peer-to-peer lending services, fintech adoption towards SMEs' performance, factors influencing fintech adoption (Phung, 2023; Najib, Ermawati, Fahma, Endri, & Suhartanto, 2021; Moreira-Santos, Au-Yong-Oliveira, & Palma-Moreira, 2022), and shariah-compliant fintech (Azman & Zabri, 2022). Collectively, these studies highlight the significance of various factors, including perceptions, expectations, social influence, and contextual elements, in driving the adoption of Fintech across different regions, industries, and user groups. Additionally, they highlight the positive influence of fintech adoption on income sustainability, financial performance, and business sustainability, providing valuable insights for stakeholders aiming to foster fintech adoption and support its sustainable growth.

3.5 Fintech Impact

The theme of fintech impact encompasses articles focused on the influence of financial technology in the industry. Fintech has been shown to impact the business sustainability of MSMEs (Yaniar, Sasono, Sukoco, & Rosyid, 2021), the future of digital entrepreneurship and entrepreneurship (Chong & Teoh, 2022; Pratolo, 2020; Liu, Wang, Zhang, Fang, & Xiao, 2023; Kedir & Kouame, 2022; Mutamimah & Indriastuti, 2023), poverty reduction (Appiah-Otoo & Song, 2021), enterprise profitability (Carbó-Valverde, Cuadros-Solas, & Rodríguez-Fernández, 2022). These studies collectively highlight the transformative potential of fintech across diverse areas, including access to finance, gender empowerment, poverty reduction, entrepreneurial initiatives, and the financial sustainability of businesses. They provide valuable insights for policymakers, entrepreneurs, and stakeholders to harness

3.6 Fintech funding

The Fintech funding theme illustrates how innovative funding models are democratizing access to capital. Crowdfunding and peer-to-peer lending platforms are breaking down traditional barriers to finance, enabling a new generation of entrepreneurs to thrive. Fintech funding has seen significant growth globally as technological advancements continue to evolve traditional financial services. Past studies have covered fintech funding as a solution to the survival and sustainability of MSMEs (Lestari, Darma, & Muliadi, 2020; Darma, Kadafi, & Lestari, 2020; Nursyamsu, Ningsih, & Nurdin, 2022; Babajide, Oluwaseye, Lawal, & Isibor, 2020; Babaei, Giudici, & Raffinetti, 2023; Mwemezi, Senadjki, & Sea, 2022), the implementation of crowdfunding platform (Amuna, Abu-Naser, Shobaki, & Mostafa, 2019), and the achievement of the Sustainable Development Goals (Ferrata, 2019). These studies offer a comprehensive look at the connection of fintech and various aspects of economic development.

3.7 Model framework

The model framework theme points to the need for continued research and development in creating robust frameworks that can guide the strategic implementation of Fintech. As the financial landscape continues to evolve, so must the models that help to utilize the power of Fintech. For instance, studies involving the model of Islamic Fintech (Hassan, Rabbani, & Ali, 2020; Azman N. H., Zabri, Masron, & Malim, 2020), and the Business Canvas Model (Hadi, Adi, Arintoko, & Ahmad, 2023; Pizzi, Corbo, & Caputo, 2020). Moreover, a study on B2B/B2C business model (Bittini, Rambaud, Pascual, & Moro-Visconti, 2022) analyzed whether the sustainability department affects the business model adopted by Spanish fintech. Most of the studies focus on the perspective of micro, small, and medium enterprises due to

their potential in improving access to finance and encouraging innovation by providing new ways to manage finances, access markets, and optimize operations. This can eventually contribute to the growth and sustainability of MSMEs

4. Discussion

The thematic analyses developed five themes, namely fintech performance, fintech adoption, fintech impact, fintech funding, and model framework. This section presents further discussion on the developed themes. The theme of fintech performance discovered that fintech plays a pivotal role in MSMEs, indicated by the positive influence of financial literacy and technological adoption on MSME performance. Therefore, demonstrating the significance of fintech tools and knowledge in managing finances and operations. The performance of fintech also helps to improve business sustainability, where the influence of financial behavior, technology utilization, and the adoption of sustainable practices is essential for the long-term survival and growth of these enterprises. Moreover, fintech firms tend to have better environmental performance and market resilience, especially during crises. Apart from improving market performance during crises, fintech's collaboration with sustainable finance can also promote green finance, emphasizing the alignment of financial technologies with environmentally friendly practices. Regulation and consumer protection play pivotal roles in ensuring the integrity of these initiatives. Sustainable business practices in SMEs are proven to be aided by fintech, encouraging economic, social, and environmental responsibilities among SMEs, especially during Industrial Revolution 4.0. Digital entrepreneurship enabled by Fintech can help alleviate societal norms and restrictive practices, fostering inclusive development. Therefore, it can be said that fintech's role extends beyond commercial success, emphasizing its potential for societal empowerment and addressing constraints.

The fintech adoption theme unveiled various aspects across different contexts, shedding light on the factors influencing its uptake and the subsequent impacts on businesses and financial inclusivity. Several factors influencing fintech adoption were identified. Firstly, performance expectancy, which is the perceived benefits and usefulness of using fintech platforms, including income sustainability, financial performance improvement, and business sustainability. Another identified factor is social influence, representing the impact of peers, close associates, and societal perceptions on the intention to adopt fintech. The presence of favorable conditions or support structures that ease the adoption process also contributes to the adoption of fintech. Moreover, in terms of technological context, factors such as perceptions related to convenience, usefulness, safety, trust, and effectiveness of fintech services further influence fintech adoption among users. Additionally, organizational context is one of the factors that impact fintech adoption, understood as the factors within a business that drive adoption, such as internal cost reduction, ecological footprint reduction, and consumer trends. Fintech adoption has proven to positively affect the income sustainability of micro-entrepreneurs, financial performance, business sustainability, particularly in small enterprises, and improve financial inclusion. Different countries also exhibit different factors in fintech adoption. For example, in Indonesia, MSMEs are significantly impacted by factors like performance expectancy and social influence, while in Jordan, factors such as financial satisfaction and financial performance are vital for fintech adoption among SMEs.

The fintech impact theme uncovered the influences of fintech in various areas. For example, the studies show how fintech plays a role in empowering marginalized social groups, especially women in Africa, by enhancing their access to financial resources and facilitating entrepreneurship. Fintech initiatives within educational environments also encourage

entrepreneurship among students, fostering greater financial inclusion and contributing to livelihood improvements. The integration of lean inventory practices (referring to the degree to which a firm holds lower inventories than its similarly sized peers) with fintech leads to reduced financing constraints for SMEs. This impact is significant as it helps businesses access funding more easily, thereby supporting their growth and operational stability. Furthermore, fintech tools and digital marketing have a positive impact on the financial performance and sustainability of MSMEs. They aid in streamlining business operations, improving efficiency, and sustaining growth over time. Financial literacy moderates the impact of fintech on financial inclusion for SMEs, emphasizing the importance of educating businesses on leveraging fintech effectively to drive growth and sustainability. Fintech initiatives, especially those focusing on third-party payment and credit measures, contribute significantly to poverty reduction. Hence, by complementing economic growth and financial development, fintech plays a crucial role in lifting people out of poverty.

The studies under the theme of Fintech Funding discussed its importance in enhancing access to finance, especially through crowdfunding platforms. These platforms provide a means for entrepreneurs and SMEs to access capital that might otherwise be difficult to obtain through traditional financial institutions. For MSMEs, fintech funding is a lifeline, aiding in accessing loans, conducting transactions, and increasing operational efficiency. By providing financial solutions tailored to the needs of MSMEs, fintech contributes significantly to their sustainability and expansion. Furthermore, fintech funding can significantly contribute to achieving Sustainable Development Goals (SDGs) by addressing key areas such as poverty reduction, gender equality, and financial inclusion. By enabling access to financial services, particularly for marginalized populations and SMEs, fintech plays a pivotal role in economic empowerment and sustainable development. In economies such as Turkey and Indonesia, fintech solutions have been instrumental in promoting sustainable finance, fostering inclusivity for underbanked individuals, and supporting the growth of SMEs. The use of technology in payment systems and financial services has led to increased financial inclusivity and responsible consumption practices. Fintech also acts as a mitigating force against common lending challenges faced by SMEs, such as information asymmetry, credit risk management, and high transaction costs. By leveraging technological advancements, fintech can streamline lending processes and make them more efficient, ultimately facilitating increased access to credit for SMEs.

The current study's thematic analysis reveals that the fintech model framework yields fewer results compared to other themes. The studies cover various aspects of financial technology across different sectors, especially in the context of challenges posed by events like the COVID-19 pandemic and the evolving landscape of Islamic finance. Collectively, these studies emphasize fintech's potential in aiding MSMEs post-COVID by enabling access to capital through crowdfunding and microfinance, aligning with the Business Model Canvas to exploit emerging opportunities. Furthermore, the exploration of fintech's interface with circular economy practices reveals its potential in steering SMEs toward more sustainable business models, amplifying the adoption of circular economy practices. Insights from the Spanish fintech sectors underline the potential influence of sustainability departments on business models, shaping the pathway of these tech sectors. Finally, the assessment of Islamic fintech's impact on micro-entrepreneurs elucidates the tangible benefits of fintech tools like crowdfunding, mobile money, and peer-to-peer lending in stabilizing income streams. Collectively, these discussions illuminate fintech's multifaceted role in addressing challenges, fostering sustainability, and shaping the trajectory of diverse economic landscapes.

Hence, the current study's objective is achieved by providing support for the relationship between fintech solutions and the sustainability of entrepreneurs, showcasing how fintech positively influences and sustains entrepreneurial endeavours.

Recommendation

This section identifies research gaps and suggests several recommendations for future scholars. Identifying these gaps is significant as it indicates areas where further research and development could be highly beneficial, highlighting the need for more attention, investment, or exploration within the specific domain of model frameworks in the fintech industry.

The research gaps in existing studies on fintech performance revolve around the need for more distinct investigations into the mediation and moderation relationship between constructs such as financial literacy, technology adoption, and fintech impact on business performance. Moreover, longitudinal studies tracking fintech's evolution, particularly in varied geographical and contextual settings, could offer comprehensive insights. Qualitative approaches and in-depth case studies are needed to complement quantitative findings and provide a deeper understanding of fintech's societal impacts and potential for addressing social constraints.

Furthermore, there is limited utilization of Shariah-compliant fintech among Muslim micro-entrepreneurs in Malaysia, emphasizing the need to understand factors influencing fintech adoption and its impact on income sustainability. Research in fintech has increased over the years, yet specific demographics like women entrepreneurs, students, and marginalized groups lack comprehensive exploration in understanding fintech adoption barriers.

Additionally, the reviewed studies on fintech funding also reveal the need for more comprehensive investigations into regulatory frameworks' influence on fintech. Exploring qualitative insights alongside quantitative data, assessing long-term impacts, understanding the relationship between fintech and traditional finance, and examining fintech's direct contributions to achieving SDGs are crucial. Addressing these gaps can provide a more comprehensive understanding of fintech's role, aiding policymakers, financial institutions, and entrepreneurs in leveraging fintech for sustained growth and development, particularly in supporting MSMEs.

There is a scarcity of empirical studies on fintech impact and regional fintech development in various sectors such as manufacturing. Explorations into the depth of fintech's influence on the financial performance and sustainability of MSMEs, digital-based enterprises' long-term strategies, and fintech's role in campus entrepreneurship remain limited. There is also a need for examining fintech's broader implications for poverty alleviation, profitability, and the survival of fintech start-ups.

In terms of model framework, further analysis could be done by future researchers by highlighting the potential of fintech frameworks, for example in microfinance, since there is limited quantitative depth in impact analyses and comparative studies. There is also a need for more focused investigations into fintech's role within Islamic finance frameworks. Addressing these gaps could offer a more comprehensive understanding of fintech framework in fostering sustainable finance and its broader implications for various sectors and economies.

5. Conclusion

In conclusion, these studies collectively illustrate the transformative journey of fintech from traditional approaches towards becoming tech-driven, showcasing its evolution and impacts on various sectors. Fintech plays a pivotal role in transitioning from conventional financial practices to technology-driven solutions, particularly in aiding small businesses during crises, fostering sustainable business models, and contributing to economic growth. The analysis highlights fintech's significant role in influencing financial performance, sustainability, inclusivity, and societal empowerment. It emerges as a transformative force, particularly in supporting MSMEs during crises and contributing to economic growth. Fintech's effects are diverse, spanning from empowering marginalized groups to streamlining operations, promoting financial inclusion, and aiding in reducing poverty. Through diverse applications like crowdfunding, microfinance, and digital payment systems, fintech has significantly improved access to finance, streamlined operations, and enhanced financial inclusivity. These advancements highlight fintech's shift from traditional financial practices towards more tech-driven, innovative solutions, showcasing its potential to revolutionize the financial landscape and promote sustainable, inclusive economic growth.

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Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this study.

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