ISSN 2669-2481 / eISSN 2669-249X

BUSINESS, MANAGEMENT AND ECONOMICS ENGINEERING

2024
Volume 22
Issue 2
Pages 333–356

https://doi.org/10.3846/bmee.2024.21449

LEVERAGING FINANCIAL LITERACY INTO SUSTAINABLE BUSINESS PERFORMANCE: A MEDIATED-MODERATED MODEL

Kusuma RATNAWATI [1], Viktor KOVAL [2✉], I Wayan Edi ARSAWAN [3], Yigit KAZANCOGLU [4], Iryna LOMACHYNSKA [5], Hanna SKYBA [6]

[1]Department of Management, Faculty of Economics and Business, Universitas Brawijaya, Malang, Indonesia
[2]Department of Business and Tourism Management, Izmail State University of Humanities, Izmail, Ukraine
[3]Department of Business Administration, Politeknik Negeri Bali, Bali, Indonesia
[4]Department of Logistics Management, Yasar University, Izmir, Turkey
[5]Department of Economics and Entrepreneurship, Odesa I.I. Mechnikov National University, Odesa, Ukraine
[6]Interregional Academy of Personnel Management, Kyiv, Ukraine

Article History:
- received 02 May 2024
- accepted 27 August 2024

Abstract. *Purpose* – The current study evaluates the linkage between financial literacy and the sustainable business performance model with access to finance and fintech adoption. Further, the moderating role of top management support in the linkage between financial literacy toward access to finance and fintech adoption was verified.

Research methodology – This research was conducted in the SME sector in Indonesia. The sample frame were 261 SMEs and 783 respondents from three levels of management. Data was collected in the October-December 2023 period. Data were obtained utilizing Likert-scaled questionnaires and analyzed using SmartPLS.

Findings – The results demonstrate that financial literacy is an instrumental driver of access to finance and fintech adoption that promotes sustainability performance. Subsequently, the study highlights the critical role of access to finance and fintech adoption as the mediator and top management support as moderator.

Research limitations – The study is solely performed on the SME sector in one country; thus, the findings' generalization is lacking.

Practical implications – SME managers need to upgrade their financial literacy because financially knowledgeable managers are keenly informed of the costs, benefits, and risks related to funding schemes to encourage sustainable performance.

Originality/Value – Empirical research that explores the implication of financial literacy on access to finance and fintech adoption in promoting sustainability performance is lacking, reported solely on manufacturing companies and banks. Meanwhile, the SME sector, especially in developing countries, is understudied. Consequently, the initial study leads the examination of financial literacy's role in enhancing access to finance and fintech adoption to foster the sustainability performance of SMEs.

Keywords: financial literacy, knowledge, fintech adoption, sustainable business performance.

JEL Classification: D22, D23, E44, G14, G41.

✉Corresponding author. E-mail: ***victor-koval@ukr.net***

1. Introduction

The 2030 Agenda outlines 17 dimensions of Sustainable Development Goals (SDGs) that highlight the significance of natural resource efficiency by harmonizing the three aspects: economic, environmental, and social (Chan et al., 2022; Khan et al., 2023; Obeidat et al., 2023). It promotes converting regenerative systems to eliminate the disposal of resources, items, and power (Geissdoerfer et al., 2020). Further, the 2017 Carbon Majors Report predicts that 25 manufacturing and public organizations are accountable for 51% of total GHG emissions (Rodríguez-Espíndola et al., 2022). However, it is challenging to determine accurate percentage figures for the SME sector since they do not quantify their carbon footprint (Darmandieu et al., 2022; Mura et al., 2020). Thus, while multinational companies have introduced sustainability management, SMEs are relatively less involved although sustainability values mandate organizations to engage their goals and incorporate sustainability ethics into their strategies (Arsawan et al., 2024a; Koval et al., 2023; Siddik et al., 2023).

Scholars conclude that sustainable business performance is pivotal in an organization's contribution to environmental preservation (Gupta et al., 2021; Jabbour et al., 2020). Sustainable business performance demonstrates how an organization incorporates environmental, social, and governance dimensions toward its business activities, positively impacting the economy and community (Chan et al., 2022; Gupta et al., 2021; Jabbour et al., 2020). Considering that sustainable business performance is recognized as an indispensable constituent in maintaining sustainability, the inevitable query of the way organizations accomplish excellent sustainability performance involuntarily emerges (Chan et al., 2022; Gupta et al., 2021). Nonetheless, there has yet to be a consensus on the drivers of an organization's sustainable business performance (Abbasi et al., 2021; Pizzi et al., 2021; Siddik et al., 2023). The study posits that financial literacy promotes access to finance, and adopting fintech at the organizational level leads to enhanced sustainable business performance. The critical role of financial literacy is to mitigate finance for facilitating enhanced access and adoption of technology that can be utilized to leverage dimensions of sustainable business performance (Abbasi et al., 2021; Siddik et al., 2023; Suryantini et al., 2023). Accordingly, the study bridges the subsequent gaps.

First, previous studies investigating the linkage between financial literacy and fintech adoption in promoting sustainable business performance dimensions are insufficient (Siddik et al., 2023). To connect the gap, it is imperative to theorize and pragmatically confirm the linkage between financial literacy and fintech adoption from the organizational sustainability perspective. Second, measurement is a profound challenge in assessing sustainable business performance because the concept is multidimensional (Jha & Rangarajan, 2020; Mokbel Al Koliby et al., 2024). The empirical literature demonstrates that the concept is classified as subjective and fragmented across many dimensions, leading to the development of relevant inferences (Siddik et al., 2023). Scholars have proposed models to quantify sustainability; however, they emphasize particular dimensions, i.e., environmental performance (Tian & Lin, 2019). Considering the lack of comprehensive measurement, environmental, economic, and social dimensions are required to be combined to determine sustainable business performance (Mokbel Al Koliby et al., 2024).

Third, previous studies yield diversified results on the implication of managers' financial literacy in advancing sustainable business performance. Several studies evaluate the influence of financial literacy on sustainable business performance; nonetheless, studies on the mediating influences of aspects that intervene in the interaction of the two constructs are dearth. Previous studies have explored the direct linkages between fintech adoption and access to finance, financial literacy and access to finance and their respective influences on sustainable business performance dimensions (Babajide et al., 2023; Siddik et al., 2023; Tian & Lin, 2019) investigating the impacts directly and indirectly with access to finance and fintech adoption as mediators will create a substantial difference in the sustainability literature.

Fourth, the coverage of the study is not limited to the linkage between financial literacy, access to finance, and fintech adoption but is extended by adding top management support as a moderator of the linkage between financial literacy and access to finance, financial literacy and fintech adoption based on three primary considerations. First, enhancing financial literacy, access to finance, and fintech adoption is defined by managers' attentiveness and involvement in promoting the ecosystem (Haldorai et al., 2022; Latan et al., 2018). The crucial role of top management support is to regulate and create green organizational culture (Authelet et al., 2021; Ling & Xu, 2021). Second, the alignment of fintech adoption and access to finance requires maximum support from top management (Haldorai et al., 2022; Latan et al., 2018). It will stimulate transformation for environmentally oriented strategic and operational approaches. The complexity of converting strategic and operational approaches, especially the three constructs, leads to internal resistance that can impede the integration of environmentally oriented policies (Santa-Maria et al., 2022). Accordingly, employees with the knowledge and skills necessary to transform to sustainable business performance are vital. Third, top management support reinforces the linkage between financial literacy, access to finance, and fintech adoption and accelerates organizations' establishment of principles, finance, and practices that accommodate environmental preservation (Arsawan et al., 2024a). Furthermore, evaluating fintech adoption in developing countries is imperative because SMEs are considered a promising sector contributing to sustainability values. Nevertheless, empirical studies indicate a trend toward technology adoption, although SMEs possess limited resources to accommodate environmental responsibility (Hj Talip & Wasiuzzaman, 2023; Qalati et al., 2021; Shmygol et al., 2021).

2. Theory and hypotheses formulation

2.1. Ecological modernization theory (EMT)

EMT proposes that ecological problems stem from economic escalation. It can be mitigated by promoting source proficiency with high-tech, i.e., fintech innovations (Rehman Khan et al., 2022). The uplifting point of this theory is that institutional structures enable people to meet environmental sustainability challenges (Siddik et al., 2023). It encourages people to navigate the global biosphere by harnessing sophisticated technologies to underpin more sustainable development, enhancing the quality of the earth (Suhartanto et al., 2022). Furthermore, this theory emphasizes the significance of high-tech evolvement: the discovery-novelty-dissemination of modern and ecotechnology (Cao et al., 2021; Kumar et al., 2020).

Ecological modernization facilitates eliminating raw material usage, integrating and advancing new technologies, sustainable innovation, developing competitive and innovative advanced products (Koval et al., 2023; Lin & Chen, 2021). EMT instructs that new-fangled technologies, i.e., the circular economy, elevate business performance, eventually leading to economic and environmental contributions (AL-Khatib, 2023). By harnessing sustainable innovations and technological advancements, EMT endeavors to align economic escalation and ecological preservation (Siddik et al., 2023). The existing literature conclusively demonstrates that hi-tech adoption and sustainability are utilized for environmental transformation to grasp sustainability (Rehman Khan et al., 2022; Suryantini et al., 2021). Accordingly, the study utilizes EMT as the underpinning to ascertain the linkage between fintech invention and sustainable business performance.

2.2. Resource-based view (RBV)

Adhering to RBV, organizations possess invaluable, distinct, and inimitable sources for superior performance and sustainable competitive advantage (Barney, 1991). Scholars (Hossain et al., 2021; Nandi et al., 2020; Yu et al., 2018) have scrutinized tangible (financial, technological, and physical) and intangible resources, i.e., information, knowledge, and reputation to attain competitiveness. As the involvement of organizations in preserving the environment becomes more critical, RBV has broadened its scope (Mokbel Al Koliby et al., 2024). Some researchers suggest that resources (e.g., finance) are critical to promoting engagement with green implementation and sustainability endeavours (Knight et al., 2019; Mia et al., 2022; Siddik et al., 2023). Considering finance as an imperative source for sustainability reports and superior performance, organizations with adequate finance can actively engage in various projects to preserve the environment (Ullah et al., 2021). Considering intangible assets, the financial literacy of executives is a unitary, distinctive, and valuable asset, notably in terms of access to finance and sustainable business performance (Adomako et al., 2016; Suryantini et al., 2023).

2.3. Hypotheses formulation

Financial literacy and access to finance

Financial literacy recognizes and obtains financial resources and information to reinforce the development of business strategies and to constitute premeditated investment verdicts (Babajide et al., 2023; Ye & Kulathunga, 2019). Managers knowledgeable about sources of finance tend to obtain a loan successfully, allowing the initiative to opt for veracious financing by inspecting the profits, expenditures, and loan consequences (Adomako et al., 2016; Siddik et al., 2023). Furthermore, financial literacy enables SME owners and managers to navigate financial hardship by mitigating financial consequences (Ye & Kulathunga, 2019). SME owners and managers concious of the financial circumstances are future-proofed, allowing them to adopt more favorable financial decisions that subsequently facilitate their access to finance (Adomako et al., 2016; Hussain et al., 2018). Financial literacy is also interrelated to the comprehension of diverse financial resources and the competence to attain proper supplies of financial resources for an organization (Kijkasiwat et al., 2022; Suryantini et al., 2023). Consequently, financial literacy proficiency encourages SME owners and managers to recognize financial inventions and engage in sound decision-making and proper debt management (Hj Talip & Wasiuzzaman, 2023). Accordingly, financially literate SME managers formulate the soundest financial resolutions and confidently select the veracious financial commodities (Hussain et al., 2018). Consequently, the hypothesis is:

H1. Financial literacy has a significant effect on access to finance.

Financial literacy, fintech adoption and sustainable business performance

Financial literacy is the ability to systematically assess and decide relevant financial matters (Hj Talip & Wasiuzzaman, 2023). Managers with sufficient financial literacy possess an encouraging manner concerning practical and sustainable financial management (Nkundabanyanga et al., 2017). Subsequently, financially literate managers can compile a series of financial decisions and evaluate financial conditions accurately (Babajide et al., 2023). Considering the rapid changes in the business landscape, financial literacy is a critical subject, drawing scholars' attention particularly in developing countries, since financial literacy is considered an indispensable trigger in organizational policymaking (Burchi et al., 2021). Entrepreneurs with adequate financial knowledge can implement holistic practices in finance to encourage sustainable development (Siddik et al., 2023). Empirical studies confirm similar findings (Burchi et al., 2021; Ye & Kulathunga, 2019) that financial literacy directly contributes to sustainability practices. Moreover, SME managers' financial literacy knowledge and practices are the triggers for attaining sustainability (Babajide et al., 2023). Financial literacy contributes to economic, ecological, and social performance (Siddik et al., 2023).

Financial literacy involves individual comprehension levels in discerning financial management reports. Managers with adequate financial literacy possess a coordinated attitude toward financial management making sound financial choices and evaluating financial conditions (Babajide et al., 2023). The literature discovers a positive linkage between financial literacy and fintech adoption (Jünger & Mietzner, 2020). Another study verifies the finding (Setiawan et al., 2021), revealing that financial literacy is positively linked to fintech adoption in the Indonesian SME sector. By leveraging financial literacy, SME managers gain relevant knowledge to innovate in finance (Hussain et al., 2018; Liu & Jiang, 2016). Subsequently, the proposed hypotheses are:

H2. Financial literacy has a significant effect on economic performance.

H3. Financial literacy has a significant effect on environmental performance.

H4. Financial literacy has a significant effect on social performance.

H5. Financial literacy has a significant effect on fintech adoption.

Access to finance and organizational sustainability performance

Financial resources are an imperative antecedent in establishing the operational functions of SMEs in enacting green practices toward sustainable performance (Knight et al., 2019). However, prior to incorporating sustainable actions, organizations must evaluate the financial soundness and access to finance (Siddik et al., 2023). It is essential that SME managers evaluate the costs of adhering to environmental initiative programs and optimally harness capital for sustainability activities (Hsu et al., 2017; Sajan et al., 2017; Suryantini et al., 2023). Previous findings indicate that the underlying cause of the lack of sustainable business performance stems from a deficiency of financial resources (Chege & Wang, 2020). Financial resources are critical in developing financial and non-financial performance. Specifically, SMEs require sufficient finance to support their economic, environmental, and socially sustainable-oriented activities (Siddik et al., 2023). Consequently, access to internal and external finance affects various dimensions of SMEs' sustainable business performance (Ullah et al., 2021). The study also posits that access to finance has a positive linkage with the dimensions of SMEs' sustainable business performance, leading us to hypothesize that:

H6. Access to finance has a significant effect on economic performance.

H7. Access to finance has a significant effect on environmental performance.

H8. Access to finance has a significant effect on social performance.

Fintech adoption and organizational sustainability performance

Scholars define fintech as deploying technology to more sophisticated, renewed, and comprehensive financial services (Chueca Vergara & Ferruz Agudo, 2021; Pizzi et al., 2021; Siddik et al., 2023). Fintech enforces a more substantial financial inclusion notably contributing to accomplishing the SDGs (Dwivedi et al., 2021; Setiawan et al., 2021). However, the institutional role of fintech adoption in establishing sustainable business performance remains underexplored (Siddik et al., 2023). Sustainable business performance refers to all determinants of organizational sustainability comprising economic, environmental, and social aspects emerging from organizational governance (Laskar et al., 2017; Lo & Liao, 2021). The literature has exposed social performance factors in developed (Gras & Krause, 2018; Kraus et al., 2020) and developing countries (Rodríguez-Espíndola et al., 2022; Tsai & Mutuc, 2020). Nevertheless, there is a scarcity of literature uncovering fintech adoption's role in stimulating sustainable business performance (Croutzet & Dabbous, 2021).

Further, previous studies suggest that fintech fosters SME alteration toward a sustainable business model (Pizzi et al., 2021). Fintech facilitates the acceleration of environmental investment decisions, resulting in reduced carbon emissions and resource efficiency (Chueca Vergara & Ferruz Agudo, 2021; Pizzi et al., 2021). Harnessing financial technology can elevate an organization's ability to thrive, compete, and be sustainable (Siddik et al., 2023). EMT recommends a practical viewpoint by perceiving fintech as an imperative trigger of sustainable business performance as it mitigates environmental impacts and enhances sustainable business performance (Rehman Khan et al., 2022; Tang et al., 2022). Accordingly, we incorporate the EMT outlook that fintech is an environmental transformation process capable of improving SMEs' sustainable business performance and further hypothesize:

H9. Fintech adoption has a significant effect on economic performance.

H10. Fintech adoption has a significant effect on environmental performance.

H11. Fintech adoption has a significant effect on social performance.

Mediating role of access to finance

The existing literature finds a positive impact of financial literacy on access to finance (Hj Talip & Wasiuzzaman, 2023; Hussain et al., 2018). Further, the influence of financial literacy on sustainable business performance also significant (Babajide et al., 2023; Ye & Kulathunga, 2019). Moreover, scholars confirm that access to finance drives sustainable business performance (Siddik et al., 2023). Consequently, financial literacy is critical in financial management to influence decision-making and support organizational performance (Babajide et al., 2023; Ye & Kulathunga, 2019). Nevertheless, to strengthen economic, environmental, and social performance, SMEs require financial strength and access to suitable financing (Ullah et al., 2021). As SMEs are deemed to be financially constrained and have more restrictive financial constraints, it can adversely affect the process of saving the ecosystem limiting the ability to upgrade sustainable business performance (Kijkasiwat et al., 2022). Optimizing SME managers' financial literacy can resolve financial limitations and constraints. Managers with adequate financial literacy can optimize the availability of the optimal financing options leverage access to financial resources and financial information report to promote sustainable business performance (Siddik et al., 2023). Hence, financial literacy is essential to alleviate financial restraints, including purchasing raw materials and energy and lowering emissions (Hussain et al., 2018). Accordingly, the subsequent hypotheses are proposed:

H12. Access to finance mediates the relationship between financial literacy and economic performance.

H13. Access to finance mediates the relationship between financial literacy and environmental performance.

H14. Access to finance mediates the relationship between financial literacy and social performance.

Mediating role of fintech adoption

Managers with advanced financial literacy can devise various financial strategies and evaluate financial conditions accurately (Babajide et al., 2023). Empirical evidence demonstrates a positive linkage between financial literacy and fintech adoption particularly in the SME sector (Setiawan et al., 2021). By upgrading their financial knowledge, SME managers acquire knowledge relevant to innovation in finance (Hussain et al., 2018; Liu & Jiang, 2016). Subsequently, fintech facilitates managers' participation in achieving the SDGs (Dwivedi et al., 2021; Setiawan et al., 2021). Empirically, it shows that fintech stimulates SMEs to transition to sustainable business model and accelerates environmental investment decisions, resulting in a decrease in carbon emissions and resource efficiency (Chueca Vergara & Ferruz Agudo, 2021; Pizzi et al., 2021). Therefore, fintech is recognized as an influential trigger of sustainable business performance as it mitigates environmental impacts and elevates sustainable business performance (Rehman Khan et al., 2022; Tang et al., 2022). Accordingly, despite the paucity of literature revealing fintech adoption's role in fostering sustainable business performance (Croutzet & Dabbous, 2021), technological innovation facilitates the acceleration and mitigation of environmental impacts and enhances sustainable business performance (Rehman Khan et al., 2022; Tang et al., 2022). Accordingly, the hypothesis is formulated:

H15. Fintech adoption mediates the relationship between financial literacy and economic performance.

H16. Fintech adoption mediates the relationship between financial literacy and environmental performance.

H17. Fintech adoption mediates the relationship between financial literacy and social performance.

Moderating role of top management support

Financial literacy, access to finance, and fintech adoption are acclimatized by managers' preparedness and experience with environmental conditions (Haldorai et al., 2022; Latan et al., 2018) by devising pro-ecological principles and cultivating an environmentally friendly

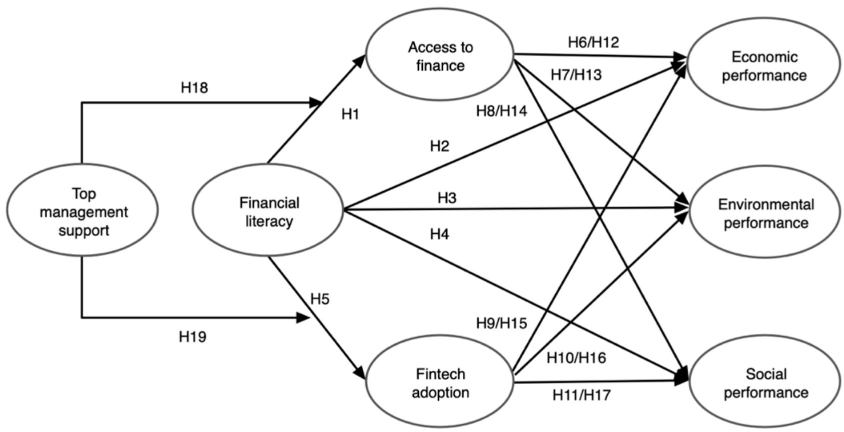

Figure 1. Conceptual framework

organizational culture (Authelet et al., 2021; Ling & Xu, 2021). It transforms environmentally oriented strategic approaches (Haldorai et al., 2022). Considering the complexity of transforming an organization's strategic and operational approaches and the susceptibility to internal resistance (Santa-Maria et al., 2022), top leaders understanding the significance of transformation toward sustainable business performance are crucial (Diaz et al., 2021; Le & Lei, 2019). Strengthening the linkage between financial literacy and access to finance, and fintech adoption by top management support, accelerates organizations to provision policies, financing, and practices that promote environmental preservation (Arsawan et al., 2024a). Subsequently, the developed hypotheses are:

H18. Top management support moderates the relationship between financial literacy and access to finance.

H19. Top management support moderates the relationship between financial literacy and fintech adoption.

Consequently, the study evaluates the linkage between financial literacy, access to finance, fintech adoption and sustainable business performance directly and indirectly. The framework is represented in Figure 1.

3. Methodology

3.1. Population and sample

SMEs constitute the spine of a growing economy (Mokbel Al Koliby et al., 2024), potentially absorbed employment, and contributed positively to Indonesia's escalating GDP (Aisjah et al., 2023; Arsawan et al., 2022). To generate an initial sample, we drew on authority databases to determine the SMEs subjected to the study. The population was 805 SMEs in East Java and Bali, Indonesia, comprising manufacturing, metal, and woodcraft. These three specializations of SMEs were purposively selected with the subsequent points. First, SMEs produce distinctive and high-value products (Parwita et al., 2021), resulting in their segmented international markets in Europe, America, and Asia. Second, the waste from the manufacturing process is transformed into economic, social, and environmental value-added products. Third, SMEs are expected to adopt technology and innovation continuously because they are competitively demanded to manufacture products that can withstand the competitive market.

From the 805 population, we retrieved a sample frame with the formula of Krejcie and Morgan (1970) to 261 SMEs and designated three respondents each to fulfilled the questionnaire. The respondents were 783 from the three low, middle, and top management levels deemed knowledgeable about the study variables (see Table 1).

Table 1. Sample frame determination

No	Fields (1)	Total Population (2)	Percentage of Population (3)	Sample (4)	Respondents (5)
1	Manufacture	347	43.1	113	339
2	Metal	275	34.2	89	267
3	Woodcraft	183	22.7	59	177
Total		805	100	261	783

Subsequently, to verify the linkages and the formulated model, we constructed a survey that was elaborated on with assistance from two professors experienced in the related field and engaged two practitioners to confirm and consolidate the legitimacy of the scales. The modified adaptation of the survey was completed and then administered to evaluate the linkages in the model. The online survey was designed to prevent participants from withdrawing while completing the survey, restrict respondents from modifying answers given initially, and prohibit participation more than once. Considering the extent of the location and financial resources, the study was conducted during October-December 2023.

3.2. Measurements

Owing to the previous studies evaluating the constructs, the measurements were adopted from the existing literature. To determine sustainable business performance, the study utilized three aspects of sustainable business performance, i.e., environmental, economic, and social. Economic performance was determined by applying three items from empirical studies (Alsayegh et al., 2020; Mokbel Al Koliby et al., 2024; Siddik et al., 2023; Zhu et al., 2008). Respondents were inquired whether they had lowered material purchase costs, energy consumption, and waste management costs. Environmental performance was calculated by enacting four items from the literature (Alsayegh et al., 2020; Mokbel Al Koliby et al., 2024; Sajan et al., 2017; Siddik et al., 2023). Respondents were inquired whether they concerned themselves with environmental sustainability by limiting ecological waste, discharges, item usage, and power utilization. Social performance was quantified by adopting five items from the literature (Alsayegh et al., 2020; Mokbel Al Koliby et al., 2024; Siddik et al., 2023). Managers were inquired if they engage in enhanced shareholder well-being, society vitality, and protection, workers' defense, society mindfulness, and diminished ecological jeopardizes.

Given the scarcity of studies on fintech adoption in the SME context in the literature, we modified seven items from previous works (Dwivedi et al., 2021; Siddik et al., 2023).

Respondents were inquired whether fintech adoption created new channels, facilitated innovation, etc. Subsequently, six items were utilized to calculate the AF construct derived from existing literature (Siddik et al., 2023; Wasiuzzaman, 2019). Respondents were inquired regarding financial readiness, diversity of financial facilities, and size of loans. The financial literacy concept was calculated utilizing five items adopted from the existing literature (Siddik et al., 2023; Ye & Kulathunga, 2019). SME managers were inquired if their workers were competent in completing financial statements, analyzing financial performance, etc. Top management support was determined with nine indicators sourced from empirical studies (Haldorai et al., 2022; Latan et al., 2018). Managers were asked whether the SME contributed to environmental conservation, environmental responsibility and fostering reputations.

3.3. Data analysis

The study utilized variance-based partial least square (PLS-SEM) to consider the formulated SBP model construction and evaluate the linkage between variables directly and indirectly. Subsequently, to examine the validity and reliability, as Hair et al. (2017) suggested, the study examined the measurement model, investigated the hypotheses and linkages between variables, and evaluated the structural model. Since the study aimed to validate the SBP model, SEM-PLS was convenient.

3.4. Common method bias (CMB)

Common method bias can occur in research with cross sectional studies through surveys. To prevent CMB, we include a common method factor into the proposed model (Podsakoff et al., 2003). Therefore, we convinced respondents of the confidentiality of their answers and their usage for the sole purpose of the study. Further, respondents were explained that there was no definitive answer for each question and encouraged to respond to every question from their knowledge, not their intuitions (Podsakoff et al., 2003). Finally, Harman's single-factor test was implemented following data assortment, explaining only 27% of the total variance, signifying that the CMB was not a concern (MacKenzie et al., 2011).

4. Data analysis and findings

4.1. Respondents

Table 2 illustrates the demographic profile of the respondents. The tabulation results demonstrated that respondents were predominantly male (73.95%) with a bachelor's level of education (59.77%) followed by master's (37.81%) and doctoral (2.42%). It is an imperative requirement for respondents' understanding of policy formulation concerning the environment at the strategic level (Arsawan et al., 2024b). From the age factor, dominated by age 41.50 (52.23%), they signaled that respondent's had maturity related to decision-making. Their experience (11–15 years – 48.78%) was considered an essential parameter of respondents' experience in formulating environmentally oriented strategic planning. Accordingly, experience is critical for the manager to reach crucial resolutions (Aisjah et al., 2023; Steinmo & Rasmussen, 2018).

Table 2. Respondent profile (n = 783)

Description		Frequency	Percentage (%)
Field	Manufacture	339	43.29
	Metal	267	34.09
	Woodcraft	177	22.62
Education	Bachelor	468	59.77
	Master	296	37.81
	Doctor	19	2.42
Gender	Male	579	73.95
	Female	204	26.05
Experiences	<5	89	11.36
	6–10	253	32.31
	11–15	382	48.78
	16–20	59	7.55
Age	21–30	67	8.56
	31–40	141	18.00
	41–50	409	52.23
	>50	166	21.21

4.2. Outer model measurements

The outer model was utilized to determine the reliability of the indicators against the constructs. Table 3 presents information on indicators with loading factor values exceeding 0.6. Subsequently, the CR value exceeded 0.7, with the AVE value exceeding 0.5 as the advised level. The data examination further stipulated that the square root value of the AVE exceeded the construct correlation value, demonstrating that the discriminant validity requirements were fulfilled (Hair et al., 2016). The indicators indicated that the constructs' validity requirements and reliability were suitably fulfilled. Subsequently, the VIF values were between 1.508 and 3.044 (lesser than the advised level), demonstrating that the data were free from problems concerning common method variance.

Table 3. Measurements

Variable	Code	Loading factor	CA	CR	AVE
Financial literacy (Mean: 4.391, SD: 0.522)	FNL1	0.834	0.907	0.908	0.728
	FNL2	0.855			
	FNL3	0.867			
	FNL4	0.882			
	FNL5	0.829			
Access to finance (Mean: 4.415, SD: 0.722)	ACF1	0.824	0.900	0.901	0.668
	ACF2	0.827			
	ACF3	0.811			
	ACF4	0.830			
	ACF5	0.827			
	ACF6	0.783			

End of Table 3

Variable	Code	Loading factor	CA	CR	AVE
Fintech adoption (Mean: 4.058, SD: 0.688)	FNA1	0.782	0.882	0.897	0.581
	FNA2	0.806			
	FNA3	0.825			
	FNA4	0.702			
	FNA5	0.702			
	FNA6	0.701			
	FNA7	0.802			
Economic performance (Mean: 4.389, SD: 0.658)	ECP1	0.807	0.785	0.786	0.699
	ECP2	0.863			
	ECP3	0.838			
Environmental Performance (Mean: 4.158, SD: 0.671)	ENP1	0.838	0.847	0.851	0.686
	ENP2	0.848			
	ENP3	0.839			
	ENP4	0.786			
Social Performance (Mean: 4.126, SD: 0.683)	SCP1	0.856	0.902	0.909	0.717
	SCP2	0.854			
	SCP3	0.836			
	SCP4	0.854			
	SCP5	0.834			
Top Management Support (Mean: 4.216, SD: 0.783)	TMS1	0.724	0.905	0.915	0.565
	TMS2	0.726			
	TMS3	0.765			
	TMS4	0.770			
	TMS5	0.801			
	TMS6	0.792			
	TMS7	0.731			
	TMS8	0.717			
	TMS9	0.734			

4.3. Inner model measurements

To evaluate the implication of indicators and path coefficients, the study enacted the 5000-sample bootstrap method, demonstrating the goodness-of-fit (GoF) of the model valued at 0.686 and indicating the substantiality of the model's fitness. Accordingly, this finding demonstrated that the proposed sustainable business performance model applies to the SME sector. The standardized residual root mean square (SRMR) was 0.063, and the normed fit index (NFI) test was 0.827, signifying the fitness of the model. Following the R^2 examination, economic performance was described by access to finance, financial literacy, and fintech adoption by 0.394 (39.4%). Access to finance, financial literacy, and fintech adoption explained environmental performance by 0.557 (55.7%), and access to finance, financial literacy, and fintech adoption explained social performance by 0.241 (24.1%). Finally, all Q^2 had positive values, implying that all variables had a good predictive relevance.

4.4. Testing hypotheses

Table 4 demonstrates the significant linkage between financial literacy and access to finance (β = 0.760, t-value = 37.183). Accordingly, H1 was accepted. The linkage between financial literacy and economic performance (β = 0.084, t-value = 1.799) was not significant. Therefore, H2 was rejected. The linkage between financial literacy and environmental performance (β = 0.271, t-value = 5.974), social performance (β = 0.217, t-value = 5.974), and fintech adoption (β = 0.471, t-value = 29.080) was significant. Consequently, H3–5 were supported. Furthermore, the linkage between access to finance and economic (β = 0.226, t-value = 4.417), environmental (β = 0.200, t-value = 4.318), and social performance (β = 0.147, t-value = 2.602) was also significant. Hence, H6–H8 were also supported. Finally, we evaluated the effect of fintech adoption on economic (β = 0.366, t-value = 8.263), environmental (β = 0.342, t-value = 8.253), and social performance (β = 0.169, t-value = 3.603) where the coefficient and *t* statistic was positive and significant. Accordingly, H9–11 were accepted.

Table 4. Hypothesis test of direct effect

Hypotheses	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Remarks
Financial Literacy -> Access to Finance (H1)	0.760	0.759	0.020	37.183	0.000	Supported
Financial Literacy -> Economic Performance (H2)	0.084	0.083	0.047	1.799	0.073	Not Supported
Financial Literacy -> Environmental Performance (H3)	0.271	0.268	0.045	5.974	0.000	Supported
Financial Literacy -> Social Performance (H4)	0.217	0.218	0.050	4.370	0.000	Supported
Financial Literacy -> Fintech Adoption (H5)	0.741	0.741	0.025	29.080	0.000	Supported
Access to Finance -> Economic Performance (H6)	0.226	0.229	0.051	4.417	0.000	Supported
Access to Finance -> Environmental Performance (H7)	0.200	0.205	0.046	4.318	0.000	Supported
Access to Finance -> Social Performance (H8)	0.147	0.153	0.057	2.602	0.010	Supported
Fintech Adoption -> Economic Performance (H9)	0.366	0.367	0.044	8.263	0.000	Supported
Fintech Adoption -> Environmental Performance (H10)	0.342	0.341	0.041	8.253	0.000	Supported
Fintech Adoption -> Social Performance (H11)	0.169	0.161	0.047	3.603	0.000	Supported

4.5. Mediating analysis

The subsequent step was to establish the mediating variables in the study. We proposed access to finance and fintech adoption mediating the linkage between financial literacy and sustainable business performance dimensions. The mediation examination demonstrated that access to finance significantly mediated the linkage between financial literacy and economic performance. Hence, H12 was accepted. Moreover, access to finance partially mediated the linkage between financial literacy and environmental and social performance. Thus, H13 and H14 were supported. Furthermore, fintech adoption significantly mediated the linkage between financial literacy and economic performance. Accordingly, H15 was accepted. Besides, fintech adoption also partially mediated the linkage between financial literacy and environmental and social performance. Consequently, H16 and H17 were supported. The mediation analysis is presented in Table 5.

Table 5. Mediating analysis

Hypotheses	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Remarks
Financial Literacy -> Access to Finance -> Economic Performance (H12)	0.172	0.174	0.039	4.367	0.000	Full mediation
Financial Literacy -> Access to Finance -> Environmental Performance (H13)	0.152	0.155	0.036	4.282	0.000	Partial mediation
Financial Literacy -> Access to Finance -> Social Performance (H14)	0.112	0.116	0.043	2.594	0.010	Partial mediation
Financial Literacy -> Fintech Adoption -> Economic Performance (H15)	0.271	0.272	0.033	8.174	0.000	Full mediation
Financial Literacy -> Fintech Adoption -> Environmental Performance (H16)	0.253	0.253	0.033	7.601	0.000	Partial mediation
Financial Literacy -> Fintech Adoption -> Social Performance (H17)	0.126	0.119	0.035	3.566	0.000	Partial mediation

4.6. Moderating test

To investigate whether the linkage between financial literacy and access to finance (H18), financial literacy, and fintech adoption (H19) was moderated by top management support, the study applied multigroup analysis (see Table 6). The analysis results indicated that top management support did not moderate the link between financial literacy and fintech adoption (β = –0.027, T value = 1.335). Thus, it was not significant, and H18 was rejected. Finally, the linkage between financial literacy and fintech adoption moderated by top management support (β = 0.078, T value = 3.204) was significant. Therefore, H19 was accepted. The output results are displayed in Figure 2.

Table 6. Moderating analysis

Hypotheses	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Remarks
Top Management Support → Financial Literacy → Access to Finance (H18)	–0.027	–0.028	0.020	1.335	0.183	No moderation
Top Management Support → Financial Literacy → Fintech adoption (H19)	0.078	0.076	0.024	3.204	0.001	Moderation

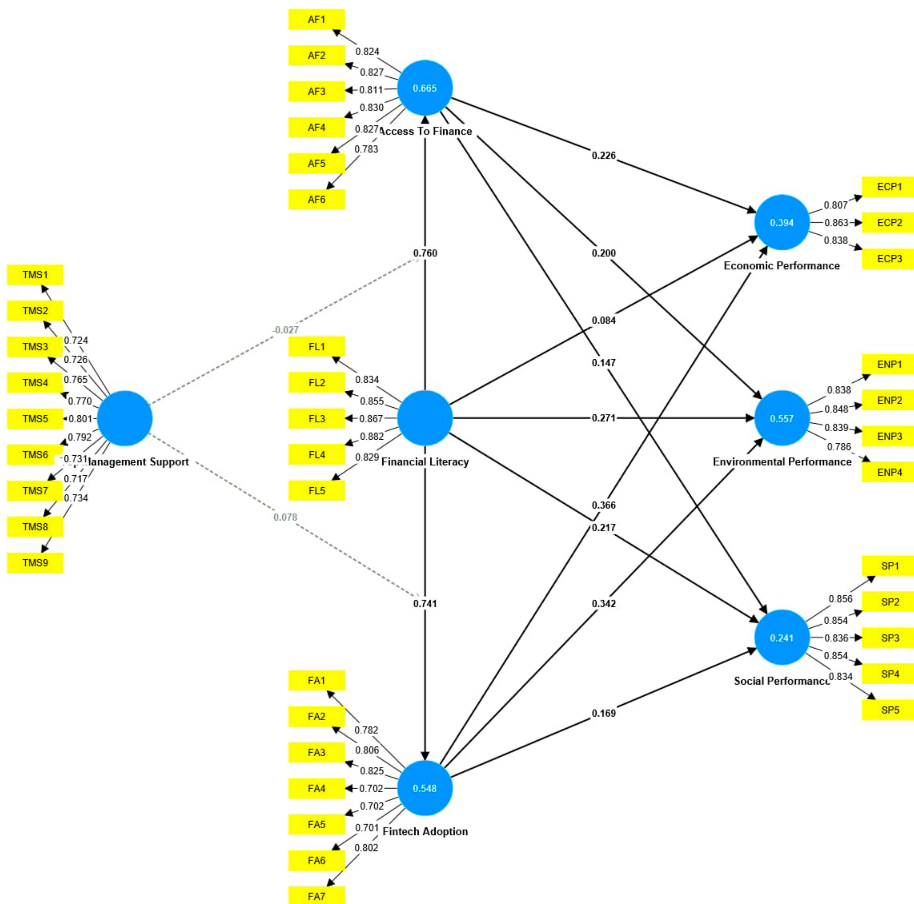

Figure 2. SBP Model (source: authors' calculation, 2024).

5. Discussion

The present study examines the linkages between financial literacy, access to finance, fintech adoption, and their impact on sustainable business performance. The results support previous findings that organizations with stronger financial literacy positively impact access to finance (H1). This result confirms previous findings that organizations with managers with adequate financial literacy are valuable assets in promoting access to finance (Adomako et al., 2016). Managers with adequate financial literacy can influence financial decision-making, leading to comprehensive resource allocation decisions (Hussain et al., 2018). The study demonstrates that financial literacy is not significant to the economic performance of SMEs (H2), contradicting recent studies (Babajide et al., 2023; Siddik et al., 2023), suggesting that SMEs' financial literacy promotes economic performance. A possible explanation is that Indonesian SME managers are more focused on environmental and social performance than economic performance, considering the characteristics of Indonesian social capital, which tends to favor these performances as a basis for economic sustainability.

Further, the study also presents substantial evidence implicating that the influence of financial literacy on environmental performance is central, supporting H3. The result is coherent with empirical evidence (Siddik et al., 2023) that organizations with stronger financial literacy are inclined to achieve good environmental performance (Babajide et al., 2023). Furthermore, the impact of financial literacy on social performance is significant, supporting H4. The finding corroborates with previous findings (Babajide et al., 2023); however, it negates the results conducted by (Siddik et al., 2023). Notably, financial literacy significantly affects fintech adoption (H5), verifying the previous study (Setiawan et al., 2021), indicating that financial literacy significantly influences support organizations (Jünger & Mietzner, 2020).

Moreover, access to finance strongly and positively affects economic, environmental, and social performance (H6–H8). Organizations with access to transparent finance can invest in finance to curtail energy consumption, raw material use, and waste handling (Hussain et al., 2018), resulting in exceptional environmental and economic performance for the organization (Adomako et al., 2016). This result strengthens the previous studies (Kijkasiwat et al., 2022; Tian & Lin, 2019), which postulate that access to finance accelerates investment in environmental and economic sustainability. However, the results contradict previous results (Siddik et al., 2023) that access to finance has no positive effect on social performance.

This study further discovers significant results between fintech adoption and sustainable business performance (H9–11). It validates that technology adoption facilitates financial access (Chueca Vergara & Ferruz Agudo, 2021; Pizzi et al., 2021; Siddik et al., 2023), allowing for financial inclusion to accomplish the SDGs (Dwivedi et al., 2021; Setiawan et al., 2021). We argue that fintech adoption as a driver of sustainable business performance remains underexplored (Siddik et al., 2023). Our findings present evidence that fintech is allowing the acceleration of environmental investments, impacting carbon emission and driving SMEs toward sustainable business model (Pizzi et al., 2021).

This result highlights the strongly and positively mediating influence of access to finance on the financial literacy-economic performance, financial literacy – environmental performance, and financial literacy – social performance linkages, supporting H12–H14. The study's findings demonstrate that managers' financial literacy strengthens access to finance, leading to superior economic, environmental, and social performance (Paulraj, 2011). Despite empirical studies that evaluate the linkage between access to finance and sustainable business performance, to the authors' understanding, no study is focussed on its mediating impact on the linkage between financial literacy and sustainable business performance.

Another prominent study result is the strongly mediating influence of fintech adoption on financial literacy and the sustainable business performance, validating hypotheses H15–H17. Empirically, it is implied that financial literacy guaranteed enhanced access to technology adoption, enhancing sustainable business performance. To the best of authors knowledge, it is the initial attempt to scrutinize fintech adoption intervention's role in the linkage between financial literacy and sustainable business performance. Accordingly, the study enriches the existing literature by verifying the mediating role of fintech adoption associated with sustainable business performance. Notably, we validate the moderating role of top management support in the linkage between financial literacy and fintech adoption (H19). Previous studies attempt to verify the moderating role of top management support; nonetheless, the study is pioneering by examining top management support in moderating the linkage between financial literacy and fintech adoption. Therefore, the study enriches the literature regarding the significance of top management support in adopting technology to promote sustainable business performance.

6. Theoretical contributions

Despite the phenomenal presence of fintech in various business sectors globally, few have explored the linkage between fintech adoption and organizational sustainability practices. Besides, how organizations' internal resources, i.e., managers' financial literacy, enhance SMEs' performance, especially in developing countries, remains elusive. The study bridges the gaps and promotes significantly to the organizational sustainability literature. First, various studies investigate the linkage between financial literacy and fintech adoption. However, studies on fintech adoption on sustainable business performance, especially for SMEs in developing countries, are scarce, relying primarily on case studies and literature reviews. Consequently, the current research calls for empirical research on FA at the organizational level and the linkage with sustainable business performance (Pizzi et al., 2021; Siddik et al., 2023). We illuminate the strong positive impact of fintech adoption on sustainable performance dimensions in SMEs.

Second, the study's critical contribution is pinpointing the antecedents and consequences of enhanced access to finance and fintech adoption. Our findings demonstrate that financial literacy alleviates organizations' financial impediments by promoting access to capital and fintech adoption. Accordingly, access to finance and fintech adoption are imperative for SME sustainability as sustainability projects involve manager knowledge and substantial investment. Given the higher start-up costs, uncertainty of returns, and risks associated with sustainability initiatives (Siddik et al., 2023), stockholders are hesitant about capitalizing on sustainability programs (Babajide et al., 2023). We highlight that SMEs can navigate financial pitfalls and elevate their sustainable business performance by incorporating financial literacy, adopting fintech, and granting access to finance. The study presents empirical evidence on the advancing recognition of the pivotal role of access to finance and fintech adoption as mediators of the linkage between financial literacy and sustainable business performance dimensions.

Third, within the organizational context, the study initially integrates financial literacy's role in leveraging access to finance and fintech adoption to drive SMEs' sustainable business performance. Consequently, by examining SMEs in Indonesia, the study extends the growing literature on financial literacy and fintech adoption in developing economies. Fourth, the study enriches the EMT and RBV by scrutinizing financial literacy's role in enhancing SMEs' sustainable business performance by developing access to finance and fintech adoption. EMT posits that businesses can mitigate the environmental impact of their operating processes by integrating hi-tech (Tang et al., 2022). Accordingly, from EMT construction, we conclude that technology advancements, i.e., fintech, stimulate environmental transformation (Khan et al., 2023), supporting SMEs in alleviating environmental impacts and upgrading sustainable business performance (Kuo & Chang, 2021; Lo & Liao, 2021; Suryantini et al., 2021). Subsequently, as postulated by resource-based view (Siddik et al., 2023), we verify that financial literacy, as a distinctive organizational source, offers sustainable competitive advantage to mitigate financial restraints while simultaneously increasing technology adoption to drive enhanced sustainable business performance (Paulraj, 2011). Consequently, we extend the scope of EMT and RBV.

7. Managerial implications

The results substantially implied to SME managers and policy makers. First, SMEs require enhancing their employees' financial literacy because financially literate managers are more conscious of particular financial schemes' expenditures, advantages, and consequences (Hussain et al., 2018). Previous studies suggest that devastating credit restraints lead to adverse environmental performance of the organization (Tian & Lin, 2019). Accordingly, SME managers encourage financial literacy by utilizing technologies, i.e., fintech. With growing access to finance, SMEs invest more and capitalize on upgrading sustainable business performance to attain sustainable competitive advantage. Ultimately, the study provides crucial recommendations, especially to SME financial managers, on investing in sustainable practices.

Second, for Indonesian SMEs, one of their primary problems is access to finance and technology. Our findings advise SMEs to adopt financial technology to accelerate their admission to credit from financial organizations. Third, laws and regulations should prioritize fintech adoption and its sustainability goals consistent with the country's strategic policies and objectives. Accordingly, the government should familiarize itself with the concept and incorporate it into national economic goals. These regulations permit SMEs to adopt fintech and comply with the country's sustainability goals.

8. Research limitations and recommendations

The study has several significant contributions. Nonetheless, it also has shortcomings as the call for upcoming studies. First, the findings are solely grounded on data collected from the

SME sector in two of Indonesia's provinces. The study excludes inter-sector or inter-state characteristics, restricting the findings' generalizability. Accordingly, forthcoming studies could implement our model in different industries and states and incorporate data longitudinally to confirm the general suitability and cogency of the results. Second, the study is conducted on the SME sector, and considering that technology adoption behavior in SMEs may vary from service businesses, the potential study is recommended to construct metrics of FA by service businesses. Third, considering that FA contributes positively to sustainable performance, future studies can consider incorporating government support and Internet of Things constructs to solidify the model we propose in the study.

9. Conclusions

Three primary conclusions are drawn from this study. First, financial literacy is the paramount driver to increase financial access and fintech adoption for the sustainability of SMEs, especially in developing countries. Second, to reduce financial barriers, the financial literacy model, fintech adoption and access to finance can be optimized in driving sustainable business performance. Contextually, access to finance and fintech adoption are mediate the relationship between financial literacy and sustainable business performance dimensions. Finally, top management support moderate the relationship between financial literacy and fintech adoption, which confirms that EMT mitigates environmental impact of hi-tech operating processes. Meanwhile, RBV provides a new perspective about sustainable competitive advantage to mitigate financial restraints, while simultaneously increasing technology adoption to drive enhanced sustainable business performance.

References

Abbasi, K., Alam, A., Brohi, N. A., Brohi, I. A., & Nasim, S. (2021). P2P lending Fintechs and SMEs' access to finance. *Economics Letters*, *204*, Article 109890. https://doi.org/10.1016/j.econlet.2021.109890

Adomako, S., Danso, A., & Ofori Damoah, J. (2016). The moderating influence of financial literacy on the relationship between access to finance and firm growth in Ghana. *Venture Capital*, *18*(1), 43–61. https://doi.org/10.1080/13691066.2015.1079952

Aisjah, S., Arsawan, I. W. E., & Suhartanto, D. (2023). Predicting SME's business performance: Integrating stakeholder theory and performance based innovation model. *Journal of Open Innovation: Technology, Market, and Complexity*, *9*(3), Article 100122. https://doi.org/10.1016/j.joitmc.2023.100122

AL-Khatib, A. w. (2023). The impact of dynamic capabilities on circular economy: The mediating effect of the industrial Internet of things. *Journal of Manufacturing Technology Management*, *34*(6), 873–895. https://doi.org/10.1108/JMTM-01-2023-0003

Alsayegh, M. F., Abdul Rahman, R., & Homayoun, S. (2020). Corporate economic, environmental, and social sustainability performance transformation through ESG disclosure. *Sustainability*, *12*(9), Article 3910. https://doi.org/10.3390/su12093910

Arsawan, I. W. E., Koval, V., Suhartanto, D., Harbar, Z., & Maslennikov, Y. (2022). Employee-driven innovation capability: The role of knowledge, creativity, and time sufficiency. *Intellectual Economics*, *16*(2), 138–165.

Arsawan, I. W. E., Koval, V., Suhartanto, D., Hariyanti, N. K. D., Polishchuk, N., & Bondar, V. (2024a). Circular economy practices in SMEs: Aligning model of green economic incentives and environmental commitment. *International Journal of Productivity and Performance Management*, *73*(3), 775–793. https://doi.org/10.1108/IJPPM-03-2022-0144

Arsawan, I. W. E., Suhartanto, D., Koval, V., Tralo, I., Demenko, V., & Azizah, A. (2024b). Enhancing the circular economy business model towards sustainable business performance: Moderating the role of environmental dynamism. *Journal of Infrastructure*, *Policy and Development*, *8*(5), Article 3321. https://doi.org/10.24294/jipd.v8i5.3321

Authelet, M., Subervie, J., Meyfroidt, P., Asquith, N., & Ezzine-de-Blas, D. (2021). Economic, pro-social and pro-environmental factors influencing participation in an incentive-based conservation program in Bolivia. *World Development*, *145*, Article 105487. https://doi.org/10.1016/j.worlddev.2021.105487

Babajide, A., Osabuohien, E., Tunji-Olayeni, P., Falola, H., Amodu, L., Olokoyo, F., Adegboye, F., & Ehikioya, B. (2023). Financial literacy, financial capabilities, and sustainable business model practice among small business owners in Nigeria. *Journal of Sustainable Finance* & *Investment*, *13*(4), 1670–1692. https://doi.org/10.1080/20430795.2021.1962663

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Burchi, A., Włodarczyk, B., Szturo, M., & Martelli, D. (2021). The effects of financial literacy on sustainable entrepreneurship. *Sustainability*, *13*(9), Article 5070. https://doi.org/10.3390/su13095070

Cao, S., Nie, L., Sun, H., Sun, W., & Taghizadeh-Hesary, F. (2021). Digital finance, green technological innovation and energy-environmental performance: Evidence from China's regional economies. *Journal of Cleaner Production*, *327*, Article 129458. https://doi.org/10.1016/j.jclepro.2021.129458

Chan, R. Y. K., Lai, J. W. M., & Kim, N. (2022). Strategic motives and performance implications of proactive versus reactive environmental strategies in corporate sustainable development. *Business Strategy and the Environment*, *31*(5), 2127–2142. https://doi.org/10.1002/bse.3011

Chege, S. M., & Wang, D. (2020). The influence of technology innovation on SME performance through environmental sustainability practices in Kenya. *Technology in Society*, *60*, Article 101210. https://doi.org/10.1016/j.techsoc.2019.101210

Chueca Vergara, C., & Ferruz Agudo, L. (2021). Fintech and sustainability: Do they affect each other? *Sustainability*, *13*(13), Article 7012. https://doi.org/10.3390/su13137012

Croutzet, A., & Dabbous, A. (2021). Do FinTech trigger renewable energy use? Evidence from OECD countries. *Renewable Energy*, *179*, 1608–1617. https://doi.org/10.1016/j.renene.2021.07.144

Darmandieu, A., Garcés-Ayerbe, C., Renucci, A., & Rivera-Torres, P. (2022). How does it pay to be circular in production processes? Eco-innovativeness and green jobs as moderators of a cost-efficiency advantage in European small and medium enterprises. *Business Strategy and the Environment*, *31*(3), 1184–1203. https://doi.org/10.1002/bse.2949

Diaz, A., Schöggl, J.-P., Reyes, T., & Baumgartner, R. J. (2021). Sustainable product development in a circular economy: Implications for products, actors, decision-making support and lifecycle information management. *Sustainable Production and Consumption*, *26*, 1031–1045. https://doi.org/10.1016/j.spc.2020.12.044

Dwivedi, P., Alabdooli, J. I., & Dwivedi, R. (2021). Role of FinTech adoption for competitiveness and performance of the bank: A study of banking industry in UAE. *International Journal of Global Business and Competitiveness*, *16*(2), 130–138. https://doi.org/10.1007/s42943-021-00033-9

Geissdoerfer, M., Pieroni, M. P. P., Pigosso, D. C. A., & Soufani, K. (2020). Circular business models: A review. *Journal of Cleaner Production*, *277*, Article 123741. https://doi.org/10.1016/j.jclepro.2020.123741

Gras, D., & Krause, R. (2018). When does it pay to stand out as stand-up? Competitive contingencies in the corporate social performance–corporate financial performance relationship. *Strategic Organization*, *18*(3), 448–471. https://doi.org/10.1177/1476127018805252

Gupta, H., Kumar, A., & Wasan, P. (2021). Industry 4.0, cleaner production and circular economy: An integrative framework for evaluating ethical and sustainable business performance of manufacturing organizations. *Journal of Cleaner Production*, *295*, Article 126253. https://doi.org/10.1016/j.jclepro.2021.126253

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling* (*PLS-SEM*) (2nd ed.). Sage publications.

Hair, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107–123. https://doi.org/10.1504/IJMDA.2017.087624

Haldorai, K., Kim, W. G., & Garcia, R. L. F. (2022). Top management green commitment and green intellectual capital as enablers of hotel environmental performance: The mediating role of green human resource management. *Tourism Management*, *88*, Article 104431. https://doi.org/10.1016/j.tourman.2021.104431

Hj Talip, S. N. S., & Wasiuzzaman, S. (2023). Influence of human capital and social capital on MSME access to finance: Assessing the mediating role of financial literacy. *International Journal of Bank Marketing*, *42*(3), 458–485. https://doi.org/10.1108/IJBM-04-2023-0214

Hossain, M. S., Hussain, K., Kannan, S., & Kunju Raman Nair, S. K. (2021). Determinants of sustainable competitive advantage from resource-based view: Implications for hotel industry. *Journal of Hospitality and Tourism Insights*, *5*(1), 79–98. https://doi.org/10.1108/JHTI-08-2020-0152

Hsu, C.-H., Chang, A.-Y., & Luo, W. (2017). Identifying key performance factors for sustainability development of SMEs – Integrating QFD and fuzzy MADM methods. *Journal of Cleaner Production*, *161*, 629–645. https://doi.org/10.1016/j.jclepro.2017.05.063

Hussain, J., Salia, S., & Karim, A. (2018). Is knowledge that powerful? Financial literacy and access to finance: An analysis of enterprises in the UK. *Journal of Small Business and Enterprise Development*, *25*(6), 985–1003. https://doi.org/10.1108/JSBED-01-2018-0021

Jabbour, C. J. C., Seuring, S., de Sousa Jabbour, A. B. L., Jugend, D., Fiorini, P. D. C., Latan, H., & Izeppi, W. C. (2020). Stakeholders, innovative business models for the circular economy and sustainable performance of firms in an emerging economy facing institutional voids. *Journal of Environmental Management*, *264*, Article 110416. https://doi.org/10.1016/j.jenvman.2020.110416

Jha, M. K., & Rangarajan, K. (2020). Analysis of corporate sustainability performance and corporate financial performance causal linkage in the Indian context. *Asian Journal of Sustainability and Social Responsibility*, *5*(1), Article 10. https://doi.org/10.1186/s41180-020-00038-z

Jünger, M., & Mietzner, M. (2020). Banking goes digital: The adoption of FinTech services by German households. *Finance Research Letters*, *34*, Article 101260. https://doi.org/10.1016/j.frl.2019.08.008

Khan, S. A. R., Ahmad, Z., Sheikh, A. A., & Yu, Z. (2023). Green technology adoption paving the way toward sustainable performance in circular economy: A case of Pakistani small and medium enterprises. *International Journal of Innovation Science*. https://doi.org/10.1108/IJIS-10-2022-0199

Kijkasiwat, P., Shahid, A. U., Hassan, M. K., & Hunjra, A. I. (2022). Access to finance, social capital and the improvement of corporate performance: Evidence from Southeast Asia. *Managerial Finance*, *48*(7), 1047–1068. https://doi.org/10.1108/MF-10-2021-0519

Knight, H., Megicks, P., Agarwal, S., & Leenders, M. (2019). Firm resources and the development of environmental sustainability among small and medium-sized enterprises: Evidence from the Australian wine industry. *Business Strategy and the Environment*, *28*(1), 25–39. https://doi.org/10.1002/bse.2178

Koval, V., Arsawan, I. W. E., Suryantini, N. P. S., Kovbasenko, S., Fisunenko, N., & Aloshyna, T. (2023). Circular economy and sustainability-oriented innovation: Conceptual framework and energy future avenue. *Energies*, *16*(1), Article 243. https://doi.org/10.3390/en16010243

Kraus, S., Rehman, S. U., & García, F. J. S. (2020). Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation. *Technological Forecasting and Social Change*, *160*, Article 120262. https://doi.org/10.1016/j.techfore.2020.120262

Krejcie, R. V, & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, *30*(3), 607–610. https://doi.org/10.1177/001316447003000308

Kumar, R., Singh, R. Kr., & Dwivedi, Y. Kr. (2020). Application of industry 4.0 technologies in SMEs for ethical and sustainable operations: Analysis of challenges. *Journal of Cleaner Production*, *275*, Article 124063. https://doi.org/10.1016/j.jclepro.2020.124063

Kuo, L., & Chang, B.-G. (2021). The affecting factors of circular economy information and its impact on corporate economic sustainability-Evidence from China. *Sustainable Production and Consumption*, *27*, 986–997. https://doi.org/10.1016/j.spc.2021.02.014

Laskar, N., Chakraborty, T. K., & Maji, S. G. (2017). Corporate sustainability performance and financial performance: Empirical evidence from Japan and India. *Management and Labour Studies*, *42*(2), 88–106. https://doi.org/10.1177/0258042X17707659

Latan, H., Jabbour, C. J. C., Lopes de Sousa Jabbour, A. B., Wamba, S. F., & Shahbaz, M. (2018). Effects of environmental strategy, environmental uncertainty and top management's commitment on corporate environmental performance: The role of environmental management accounting. *Journal of Cleaner Production*, *180*, 297–306. https://doi.org/10.1016/j.jclepro.2018.01.106

Le, P. B., & Lei, H. (2019). Determinants of innovation capability: The roles of transformational leadership, knowledge sharing and perceived organizational support. *Journal of Knowledge Management*, *23*(3), 527–547. https://doi.org/10.1108/JKM-09-2018-0568

Lin, Y. S., & Chen, M. (2021). Implementing TRIZ with supply chain management in new product development for small and medium enterprises. *Processes*, *9*(4), Article 614. https://doi.org/10.3390/pr9040614

Ling, M., & Xu, L. (2021). How and when financial incentives crowd out pro-environmental motivation: A longitudinal quasi-experimental study. *Journal of Environmental Psychology*, *78*, Article 101715. https://doi.org/10.1016/j.jenvp.2021.101715

Liu, L., & Jiang, Z. (2016). Influence of technological innovation capabilities on product competitiveness. *Industrial Management and Data Systems*, *116*(5), 883–902. https://doi.org/10.1108/IMDS-05-2015-0189

Lo, F.-Y., & Liao, P.-C. (2021). Rethinking financial performance and corporate sustainability: Perspectives on resources and strategies. *Technological Forecasting and Social Change*, *162*, Article 120346. https://doi.org/10.1016/j.techfore.2020.120346

MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *Mis Quarterly*, *35*(2), 293–334. https://doi.org/10.2307/23044045

Mia, M. M., Rizwan, S., Zayed, N. M., Nitsenko, V., Miroshnyk, O., Kryshtal, H., & Ostapenko, R. (2022). The impact of green entrepreneurship on social change and factors influencing AMO theory. *Systems*, *10*(5), Article 132. https://doi.org/10.3390/systems10050132

Mokbel Al Koliby, I. S., Abdullah, H. H., & Mohd Suki, N. (2024). Linking entrepreneurial competencies, innovation and sustainable performance of manufacturing SMEs. *Asia-Pacific Journal of Business Administration*, *16*(1), 21–40.
https://doi.org/10.1108/APJBA-09-2021-0480

Mura, M., Longo, M., & Zanni, S. (2020). Circular economy in Italian SMEs: A multi-method study. *Journal of Cleaner Production*, *245*, Article 118821. https://doi.org/10.1016/j.jclepro.2019.118821

Nandi, M. L., Nandi, S., Moya, H., & Kaynak, H. (2020). Blockchain technology-enabled supply chain systems and supply chain performance: A resource-based view. *Supply Chain Management*, *25*(6), 841–862. https://doi.org/10.1108/SCM-12-2019-0444

Nkundabanyanga, S. K., Akankunda, B., Nalukenge, I., & Tusiime, I. (2017). The impact of financial management practices and competitive advantage on the loan performance of MFIs. *International Journal of Social Economics*, *44*(1), 114–131. https://doi.org/10.1108/IJSE-05-2014-0104

Obeidat, S. M., Abdalla, S., & Al Bakri, A. A. K. (2023). Integrating green human resource management and circular economy to enhance sustainable performance: An empirical study from the Qatari service sector. *Employee Relations*, *45*(2), 535–563. https://doi.org/10.1108/ER-01-2022-0041

Parwita, G. B. S., Arsawan, I. W. E., Koval, V., Hrinchenko, R., Bogdanova, N., & Tamošiūnienė, R. (2021). Organizational innovation capability: Integrating human resource management practice, knowledge management and individual creativity. *Intellectual Economics*, *15*(2), 22–45.

Paulraj, A. (2011). Understanding the relationships between internal resources and capabilities, sustainable supply management and organizational sustainability. *Journal of Supply Chain Management*, *47*(1), 19–37. https://doi.org/10.1111/j.1745-493X.2010.03212.x

Pizzi, S., Corbo, L., & Caputo, A. (2021). Fintech and SMEs sustainable business models: Reflections and considerations for a circular economy. *Journal of Cleaner Production*, *281*, Article 125217. https://doi.org/10.1016/j.jclepro.2020.125217

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Qalati, S. A., Yuan, L. W., Khan, M. A. S., & Anwar, F. (2021). A mediated model on the adoption of social media and SMEs' performance in developing countries. *Technology in Society*, *64*, Article 101513. https://doi.org/10.1016/j.techsoc.2020.101513

Rehman Khan, S. A., Yu, Z., Sarwat, S., Godil, D. I., Amin, S., & Shujaat, S. (2022). The role of block chain technology in circular economy practices to improve organisational performance. *International Journal of Logistics Research and Applications*, *25*(4–5), 605–622. https://doi.org/10.1080/13675567.2021.1872512

Rodríguez-Espíndola, O., Cuevas-Romo, A., Chowdhury, S., Díaz-Acevedo, N., Albores, P., Despoudi, S., Malesios, C., & Dey, P. (2022). The role of circular economy principles and sustainable-oriented innovation to enhance social, economic and environmental performance: Evidence from Mexican SMEs. *International Journal of Production Economics*, *248*, Article 108495. https://doi.org/10.1016/j.ijpe.2022.108495

Sajan, M. P., Shalij, P. R., Ramesh, A., & Puthanveettil, B. A. (2017). Lean manufacturing practices in Indian manufacturing SMEs and their effect on sustainability performance. *Journal of Manufacturing Technology Management*, *28*(6), 772–793. https://doi.org/10.1108/JMTM-12-2016-0188

Santa-Maria, T., Vermeulen, W. J. V., & Baumgartner, R. J. (2022). The circular sprint: Circular business model innovation through design thinking. *Journal of Cleaner Production*, *362*, Article 132323. https://doi.org/10.1016/j.jclepro.2022.132323

Setiawan, B., Nugraha, D. P., Irawan, A., Nathan, R. J., & Zoltan, Z. (2021). User innovativeness and fintech adoption in Indonesia. *Journal of Open Innovation: Technology*, *Market*, *and Complexity*, *7*(3), Article 188. https://doi.org/10.3390/joitmc7030188

Siddik, A. B., Rahman, M. N., & Yong, L. (2023). Do fintech adoption and financial literacy improve corporate sustainability performance? The mediating role of access to finance. *Journal of Cleaner Production*, *421*, Article 137658. https://doi.org/10.1016/j.jclepro.2023.137658

Shmygol, N., Galtsova, O., Shaposhnykov, K., & Bazarbayeva, S. (2021). Environmental management policy: An assessment of ecological and energy indicators and effective regional management (on the example of Ukraine). *Polityka Energetyczna – Energy Policy Journal*, *24*(4), 43–60. https://doi.org/10.33223/epj/143836

Steinmo, M., & Rasmussen, E. (2018). The interplay of cognitive and relational social capital dimensions in university-industry collaboration: Overcoming the experience barrier. *Research Policy*, *47*(10), 1964–1974. https://doi.org/10.1016/j.respol.2018.07.004

Suhartanto, D., Kartikasari, A., Arsawan, I. W. E., Suhaeni, T., & Anggraeni, T. (2022). Driving youngsters to be green: The case of plant-based food consumption in Indonesia. *Journal of Cleaner Production*, *380*, Article 135061. https://doi.org/10.1016/j.jclepro.2022.135061

Suryantini, N. P. S., Moeljadi, Aisjah, S., & Ratnawati, K. (2023). The sustainable competitive advantage of SMEs towards intellectual capital: The role of technology adoption and strategic flexibility. *Intellectual Economics*, *17*(1). https://doi.org/10.13165/IE-23-17-1-02

Suryantini, N. P. S., Arsawan, I. W. E., Darmayanti, N. P. A., Moskalenko, S., & Gorokhova, T. (2021). Circular economy: Barrier and opportunities for SMEs. *E3S Web of Conferences*, *255*, Article 01017. https://doi.org/10.1051/e3sconf/202125501017

Tang, Y. M., Chau, K. Y., Fatima, A., & Waqas, M. (2022). Industry 4.0 technology and circular economy practices: Business management strategies for environmental sustainability. *Environmental Science and Pollution Research*, *29*(33), 49752–49769. https://doi.org/10.1007/s11356-022-19081-6 (Retraction published 2024)

Tian, P., & Lin, B. (2019). Impact of financing constraints on firm's environmental performance: Evidence from China with survey data. *Journal of Cleaner Production*, *217*, 432–439. https://doi.org/10.1016/j.jclepro.2019.01.209

Tsai, C.-H., & Mutuc, E. B. (2020). Evidence in Asian food industry: Intellectual capital, corporate financial performance, and corporate social responsibility. *International Journal of Environmental Research and Public Health*, *17*(2), Article 663. https://doi.org/10.3390/ijerph17020663

Ullah, F., Degong, M., Anwar, M., Hussain, S., & Ullah, R. (2021). Supportive tactics for innovative and sustainability performance in emerging SMEs. *Financial Innovation*, *7*(1), Article 80. https://doi.org/10.1186/s40854-021-00284-8

Wasiuzzaman, S. (2019). Resource sharing in interfirm alliances between SMEs and large firms and SME access to finance: A study of Malaysian SMEs. *Management Research Review*, *42*(12), 1375–1399. https://doi.org/10.1108/MRR-10-2018-0369

Ye, J., & Kulathunga, K. (2019). How does financial literacy promote sustainability in SMEs? A developing country perspective. *Sustainability*, *11*(10), Article 2990. https://doi.org/10.3390/su11102990

Yu, W., Chavez, R., Jacobs, M. A., & Feng, M. (2018). Data-driven supply chain capabilities and performance: A resource-based view. *Transportation Research Part E: Logistics and Transportation Review*, *114*, 371–385. https://doi.org/10.1016/j.tre.2017.04.002

Zhu, Q., Sarkis, J., & Lai, K. (2008). Confirmation of a measurement model for green supply chain management practices implementation. *International Journal of Production Economics*, *111*(2), 261–273. https://doi.org/10.1016/j.ijpe.2006.11.029